FINDING OF EMERGENCY

Executive Summary

California and the entire western United States continue to face a significant drought in the wake of one of the driest periods on record, driven by climate change and extreme hydrologic conditions. The Sacramento-San Joaquin Delta (Delta) watershed is experiencing a third year of continued dry conditions following a dry year in 2020 and critically dry year in 2021. Water supply in many parts of California, including the Delta watershed, has been insufficient to meet a significant portion of water demands. Addressing the severe water shortage in the Delta watershed requires urgent action to ensure water supplies are and will remain available to meet human health and safety needs, prevent saltwater intrusion into the Delta, and minimize impacts to fish and wildlife.

On August 3, 2021, the State Water Resources Control Board (State Water Board or Board) adopted an emergency curtailment and reporting regulation to effectively and efficiently administer and enforce the State's water rights system in light of severely limited water supplies in the Delta watershed. The emergency regulation was approved by the Office of Administrative Law (OAL) and became effective on August 19, 2021. The regulation will expire on August 19, 2022, one year after approval, unless it is renewed. Due to the ongoing drought conditions, on July 20, 2022, the State Water Board revised and readopted the emergency regulation to address current and potential future water supply shortages should dry conditions persist.

The emergency regulation readopted this year includes minor revisions to streamline administration of the emergency regulation, provide additional flexibility in implementation of the methodology used to determine water unavailability in the Delta watershed, and clarify existing requirements. Additionally, a new subdivision is included that would protect any water projected to be unused under water rights and claims held by the Sacramento River Settlement Contractors (SRSC) and Feather River Contractors (FRC) due to a reduction in contractual supplies to the SRSC or FRC resulting from an operations plan for the Central Valley Project (CVP) or State Water Project (SWP) that meets certain criteria. The new subdivision finds that it would be unreasonable for junior water right holders or claimants to divert any water projected to be unused by the SRSC or FRC under those circumstances because the water would need to remain instream in order to conserve water upstream later in the year in order to protect cold water pools for salmon and steelhead, improve water quality, protect carryover storage, or ensure minimum health and safety water supplies (see Proposed Amended Emergency Regulation Section 876.1, subdivision (d)(8)).

The Delta watershed provides a vital surface water supply for the state, supplying two-thirds of Californians with at least some portion of their drinking water and supplying

water for irrigation to millions of acres of farmland. It is also home to numerous fish, wildlife, and plant species listed as threatened, endangered, or special status under the state and federal Endangered Species Acts, as well as species that hold significant cultural importance to California tribes and are vital to the commercial and recreational fishing economy. Maintaining the low-salinity water quality needed for human uses in the Delta requires adequate freshwater flows to prevent tidal inflows of ocean salts. During dry periods, a significant portion of the water used to ensure that salinity does not intrude into the Delta comes from water in upstream reservoirs that was stored during earlier wet periods. Protecting stored water supplies is imperative to ensure that adequate supplies are available to prevent salinity intrusion, which would render this critical water source unusable for humans and impact ecosystem functions. Ensuring water is available to meet minimum human health and safety needs, notwithstanding the shortage conditions, is also of the utmost importance. Additional efforts are needed in the Delta watershed this year to ensure that water right holders and claimants without other means of accessing water supplies for basic health and safety can continue to divert water, even under critical drought conditions.

It is imperative that water right holders and claimants who do not have water available at their priority of right and do not provide water for minimum human health and safety uses cease diversions of water that is needed for more senior rights or that was released from upstream reservoirs for use downstream. Renewal of the emergency regulation will enable the State Water Board to continue to enforce the water rights priority system with respect to all water right holders and claimants in a timely manner and to protect critical water storage needed for minimum human health and safety, salinity control in the Delta, and some ecosystem protection.

Governor Newsom's Drought Emergency Proclamations

On April 21, 2021, Governor Gavin Newsom declared a drought state of emergency under the provisions of the California Emergency Services Act (Gov. Code section 8550 et. seq.) in Mendocino and Sonoma counties due to drought conditions in the Russian River watershed (Exec 2021a). The April 2021 proclamation also directed state agencies to take immediate actions to bolster drought resilience across the state.

On May 10, 2021, Governor Newsom expanded the drought proclamation to include counties within the Klamath River, Sacramento-San Joaquin Delta, and Tulare Lake watersheds (Exec 2021b). The May 2021 proclamation directed the State Water Board to consider emergency regulations to curtail water diversions when water is not available at water right holders' priority of right or to protect releases of stored water in the Delta watershed. For purposes of approving these emergency regulations, the May 2021 proclamation suspended the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.).

On July 8, 2021, Governor Newsom further expanded the emergency proclamation to include nine additional counties (Inyo, Marin, Mono, Monterey, San Luis Obispo, San Mateo, Santa Barbara, Santa Clara, and Santa Cruz) (Exec 2021c). Governor Newsom also signed Executive Order N-08-21 on July 8, 2021, urging all Californians to voluntarily reduce their water use by 15 percent compared to 2020 levels (Exec 2021d). The July 2021 Executive Order encouraged Californians to take actions to conserve water, such as irrigating landscapes more efficiently, fixing leaks, and installing water-efficient showerheads. The July 2021 Executive Order also directed the State Water Board to monitor progress on voluntary conservation in the coming months.

On October 19, 2021, Governor Newsom issued an additional proclamation that extended the drought emergency statewide and urged Californians to increase their water conservation efforts as urban water conservation to date had fallen significantly short of the 15 percent goal (Exec 2021e).

On March 28, 2022, Governor Newsom signed Executive Order N-7-22, acknowledging the continued drought conditions throughout the State and encouraging greater conservation to combat the drought (Exec 2022). In addition to extending the authorities and directives contained in the April 2021 proclamation, this Executive Order directed the State Water Board to: 1) consider emergency regulations to increase conservation by urban water suppliers; 2) consider a ban on non-functional commercial, industrial, and institutional turf irrigation; and 3) take other actions to facilitate protection of fish and wildlife, provision of water for human health and safety, pursue enforcement against illegal diversions and waste and unreasonable use of water, and facilitate groundwater recharge.

Emergency Defined

Water Code section 1058.5 grants the State Water Board the authority to adopt emergency regulations in certain drought years in order to: “prevent the waste, unreasonable use, unreasonable method of use, or unreasonable method of diversion, of water, to promote water recycling or water conservation, to require curtailment of diversions when water is not available under the diverter’s priority of right, or in furtherance of any of the foregoing, to require reporting of diversion or use or the preparation of monitoring reports.” Section 1058.5 applies to regulations “adopted in response to conditions which exist, or are threatened, in a critically dry year immediately preceded by two or more consecutive below normal, dry, or critically dry years or during a period for which the Governor has issued a proclamation of a state of emergency under the California Emergency Services Act (Chapter 7 (commencing with section 8550) of division 1 of title 2 of the Government Code) based on drought conditions.” As described above, the May 2021 proclamation declared a state of emergency covering the Delta watershed based on drought conditions.

Emergency regulations adopted under Water Code section 1058.5 remain in effect for up to one year and may be renewed if the Board finds that drought conditions as defined remain in effect. Section 1058.5, subdivision (b) provides that, notwithstanding Government Code sections 11346.1 and 11349.6, the Board's finding of emergency in connection with an emergency regulation promulgated under section 1058.5 is not subject to review by OAL.

Government Code section 11346.1, subdivision (a)(2), requires that, at least five working days prior to submission of the proposed emergency action to OAL, the adopting agency provide a notice of the proposed emergency action to every person who has filed a request for notice of regulatory action with the agency. After submission of the proposed emergency to OAL, OAL must allow interested persons five calendar days to submit comments on the proposed emergency regulations as set forth in Government Code section 11349.6.

The information contained within this finding of emergency provides information to support the State Water Board's emergency rulemaking under Water Code section 1058.5 and also meets the applicable requirements of Government Code sections 11346.1 and 11346.5.

Evidence of Emergency

Current Conditions

As of July 12, 2022, after three years of low precipitation, the U.S. Drought Monitor now reports that nearly 100 percent of California is experiencing moderate to exceptional drought, with approximately 60 percent of California experiencing extreme to exceptional drought (USDM 2022). The U.S. Seasonal Drought Outlook, released by the Climate Prediction Center on May 31, 2022, and valid for June 1 through August 31, 2022, shows drought is likely to persist through summer in California (NOAA 2022a). Within the Delta watershed, dry conditions have persisted for a third year in a row resulting in depleted reservoirs and dry soils. Despite large storms in October and December 2021 and late spring storms in 2022, precipitation patterns for water year 2022 remained well below normal, resulting in the driest January through April period on record based on precipitation (NOAA 2022b). As of July 1, 2022, cumulative precipitation for water year 2022 was approximately 65.6 inches across the Delta watershed, with precipitation in the Sacramento River watershed being 41.2 inches, or 79 percent of average, and precipitation in the San Joaquin River watershed being 24.4 inches, or 62 percent of average (DWR 2022a, DWR 2022b).

In most years, California receives about half of its precipitation in the months of December, January, and February, with much of that precipitation falling as snow in the Sierra Nevada mountains. A handful of large winter storms can make the difference

between a wet year and a dry one. In normal years, the snowpack stores water during the winter months and releases it through melting in the spring and summer to replenish rivers and reservoirs. However, dry conditions over the last three years resulted in low snowpack in California's mountains. The statewide snowpack on April 1, 2022, ranks in the ten worst April 1 snowpack levels on record due to accelerated snowmelt from lack of winter storms and from high temperatures (DWR 2022c). As of May 1, 2022, the statewide snowpack water content was approximately 30 percent of the historical average for that date (DWR 2022d).

The dry conditions over the past three years have caused storage in most of California's major reservoirs to fall below average levels, with total storage statewide for June 30 at 66 percent of historical average. Table 1 shows water storage conditions for major reservoirs across the state as of June 30, 2022. Shasta Lake, located on the upper Sacramento River, is a CVP reservoir and California's largest reservoir, and was at approximately 39 percent capacity, or 50 percent of average for that date. Lake Oroville, the principal reservoir for the SWP and the State's second largest reservoir, was at about 49 percent capacity, or 64 percent of average. New Melones Reservoir, a CVP facility on the Stanislaus River, was at 33 percent capacity, or 52 percent of average. Folsom Reservoir, a smaller CVP reservoir on the American River critical for providing municipal water supplies to the greater Sacramento area, is the lone exception to these continued below average storage conditions at 83 percent capacity, or 107 percent of historical average (DWR 2022e, DWR 2022f).

Table 1. Conditions of Major Water Supply Reservoirs as of June 30, 2022

Reservoir Name	Approximate Storage (acre-feet)	Percent of Capacity	Percent of Average
Shasta	1,800,000	39%	50%
Trinity	720,000	29%	38%
Oroville	1,700,000	49%	64%
Folsom	800,000	83%	107%
New Melones	780,000	33%	52%
Don Pedro	1,300,000	65%	78%
McClure	400,000	39%	55%
San Luis	790,000	39%	72%

Water Agencies' Response to Drought

Many local, state, and federal water agencies in California have taken actions in response to drought conditions and limited water supplies, including reducing or eliminating contract water deliveries and implementing voluntary and mandatory conservation efforts. Earlier this year, the State's two major water supply projects, the

CVP and SWP (collectively, the Projects), announced severe reductions in contract deliveries. On February 23, 2022, the U.S. Bureau of Reclamation (Reclamation) announced initial 2022 water supply allocations for its CVP contractors, indicating that most agricultural water supply contractors would receive a zero percent allocation from the CVP (Reclamation 2022a). Effective April 1, 2022, Reclamation updated its CVP water supply allocation for municipal and industrial contractors to the minimum amount needed for public health and safety (Reclamation 2022b). On March 18, 2022, the California Department of Water Resources (DWR) announced that deliveries to most SWP contractors would be reduced to 5 percent (DWR 2022g). In addition to reductions in deliveries to contractors that do not have their own water rights, deliveries to the SRSC and FRC under both their underlying water rights and claims and their contracts for supplemental supplies were reduced by 82 and 50 percent, respectively.

In addition to water supply reductions and conservation efforts, many water users have pursued water transfers and purchases from willing sellers to make up for reduced supplies. Additionally, some water users, including the Projects, have requested and received approvals for temporary changes to regulatory requirements to extend limited supplies. The Projects are required to bypass natural and abandoned flows and to release stored water to the extent necessary to meet water quality and flow objectives designed to protect municipal, agricultural, and fish and wildlife beneficial uses. During times of limited supply, meeting flow-dependent water quality requirements can require significant releases of previously stored water from Project reservoirs due to limited natural flows, as well as diversions by other water right holders when water is not available under their priority of right. These circumstances deplete reservoir storage and, in dry years when reservoir storage levels are critically low, create significant concerns for the Projects' abilities to manage temperature below Project reservoirs, supply water needed to meet human health and safety needs, maintain salinity control, and meet other water quality objectives. As a result of these concerns, DWR and Reclamation submitted and the Board approved, subject to terms and conditions, a temporary urgency change petition (TUCP) in water year 2021 to temporarily reduce their obligations to release water from storage to meet flow and water quality requirements in the Delta. On March 18, 2022, DWR and Reclamation jointly filed an additional TUCP to modify their obligations from April 1 through June 30, 2022, due to continued dry conditions and limited water supplies. The State Water Board's Executive Director conditionally approved the most recent TUCP on April 4, 2022.

Another action taken by DWR to respond to drought conditions was the construction of an Emergency Drought Salinity Barrier (DWR 2022h). DWR installed the barrier in order to reduce the amount of water needed to provide for salinity control in the Delta. The barrier was installed across West False River in the Delta in June 2021. DWR notched the barrier in the beginning of 2022 and proceeded to backfill it in the spring of 2022.

State Water Board Planning and Response to Drought

In May 2021, the State Water Board first released for public review and comment its Water Unavailability Methodology for the Delta Watershed (Water Unavailability Methodology) that focused on water unavailability for post-1914 appropriative water rights. State Water Board staff received and reviewed numerous public comments on the methodology, including oral comments provided during a staff-led workshop. State Water Board staff presented an update to the Water Unavailability Methodology as part of an informational item at the June 1, 2021 Board meeting. On July 23, 2021, the State Water Board released an updated version of the methodology to also address water unavailability for more senior water right claimants, including pre-1914 appropriative and riparian claimants. The July 23, 2021 version of the report describing the methodology was incorporated by reference into the emergency regulation that was adopted by the State Water Board on August 3, 2021. The emergency regulation was approved by OAL and became effective on August 19, 2021. The emergency regulation authorized the Deputy Director for the Division of Water Rights (Deputy Director) to evaluate available water supplies against demands for purposes of determining whether to issue curtailments using the Water Unavailability Methodology, as described in the July 23, 2021 report on the methodology, or comparable tools.

On August 20, 2021, the State Water Board issued initial orders imposing water right curtailment and reporting requirements to all diverters in the Delta watershed pursuant to the emergency regulation. One version of the order was issued to smaller diverters, or those with a face value or recent annual reported diversions less than 5,000 acre-feet (AF) annually; another version of the order was issued to larger diverters, or those with a face value or recent annual reported diversions of 5,000 AF annually or greater. The two versions of the order were the same except for an additional reporting requirement for larger diverters. The orders identified which priorities of water rights and claims were curtailed for the remainder of August 2021 and for September 2021. On August 31, 2021, State Water Board staff held an informational webinar to provide guidance to diverters regarding how to comply with the curtailment and reporting requirements of the orders, and future related orders and updates.

The State Water Board has provided updates to curtailment statuses via website postings and emails at least weekly since the initial orders were issued. Based on the output of the Water Unavailability Methodology, a majority of the water rights and claims within the Delta watershed were curtailed from August 20 through August 31, 2021. Curtailments in the fall of 2021 through spring of 2022 were dynamic due to storm and runoff events. Curtailments were suspended in response to increased precipitation and reimposed as available water supply decreased due to reduced runoff based on up-to-date hydrologic forecasts and real-time conditions.

In adopting the emergency regulation in 2021, the State Water Board anticipated that the methodology used to determine water unavailability might need to be adjusted. In accordance with the emergency regulation, the State Water Board has continued to refine the Water Unavailability Methodology based on evolving conditions and new information, including public input. State Water Board staff held several workshops to receive public input on specific issues and potential updates to the Water Unavailability Methodology, and considered numerous comments from stakeholders. Additionally, the data used to implement the Water Unavailability Methodology and inform curtailment decisions has been made available to the public for their independent review.

As drought conditions continued, on March 21, 2022, the State Water Board issued a dry year warning letter urging diverters throughout the State to prepare for water supply shortages. The letter informed water right holders and claimants that the Division of Water Rights planned to propose readoption of emergency regulations for the State Water Board's consideration that would allow for continued curtailment of water rights in certain watersheds if dry conditions continued or worsened.

On April 19, 2022, the State Water Board released refinements to the Water Unavailability Methodology, as well as proposed revisions to the emergency regulation for the Delta watershed, for public review and comment prior to the Board's consideration of readoption of the emergency regulation in July 2022. On May 12, 2022, State Water Board staff held a public workshop to receive input on the refinements to the methodology and the proposed revisions to the emergency regulation text. The State Water Board released another version of the Water Unavailability Methodology report describing the methodology on June 27, 2022, that included additional refinements and addressed comments received. In addition, on June 27, 2022, Board staff released a subsequent draft of the emergency regulation text for further public input, with minor corrections provided on July 6, 2022.

Need for Renewal of the Regulation

The drought emergency identified in the Governor's May 2021 proclamation persists, as acknowledged in additional updated drought proclamations and executive orders from the Governor discussed above. The existing emergency regulation for the Delta watershed that was adopted in response to drought conditions last year is set to expire on August 19, 2022. If the regulation is not renewed, the State Water Board would be unable to effectively respond to the ongoing drought emergency.

Immediate action is needed to renew the State Water Board's authority to effectively and efficiently administer and enforce the State's water rights system in light of severely limited water availability in the Delta watershed during the current drought. The State Water Board will need to curtail water diversions when natural and abandoned flows decrease to: (1) protect senior water right holders; (2) prevent the illegal diversion of

previously stored water released for downstream use or rediversion, including water released from storage to meet flow and water quality requirements; and (3) ensure that minimum human health and safety needs are met. Where natural and abandoned flows are present but are insufficient to satisfy all water rights, the State Water Board may need to curtail diversions pursuant to junior water rights to protect senior water right holders and to protect releases of stored water. Without the emergency regulation the State's authority to curtail most diversions and enforce those curtailments will not provide for timely and effective implementation of the State's water rights system during the current drought, when numerous water diversions require curtailment and enforcement in a short period of time. The emergency regulation will improve the State Water Board's ability to quickly and effectively impose and enforce curtailments to ensure that the State's water rights priority system is effectively implemented during the drought emergency.

In order to more effectively implement the water rights priority system in the Delta watershed under current drought conditions, the State Water Board needs access to better and more current information regarding water rights, water use, and water needs, and needs procedures that allow the State Water Board to obtain and use the best available information quickly. The State Water Board needs an enforceable mechanism to collect enhanced reporting information related to diversions and uses of water in the Delta watershed to inform water demand estimates and the curtailment process. Additional information is also needed regarding the basis of right and priority date for some water rights and claims to inform curtailment decisions.

The section below gives a brief overview of the Delta watershed. Subsequent sections provide a summary of existing laws and regulations and discuss the effect of the proposed regulation. Additional detail regarding the methodology for determining water unavailability in the Delta watershed and how the additional information related to diversions and uses of water in the Delta watershed will be used is also contained in later sections within the Informative Digest.

Overview of Delta Watershed

The Delta watershed encompasses the Sacramento and San Joaquin River systems shown in Figure 1. These river systems, including their tributaries, drain water from about 40 percent of California's land area. The region has a Mediterranean climate, with dry summers and wet winters. Annual precipitation can vary widely, from years of intense storms and widespread flooding to multi-year droughts. Precipitation is generally more plentiful farther north in the watershed. Due to the variation in annual and seasonal water supply and the uneven distribution of supplies over the region, the entire watershed has seen significant hydrologic development since the California Gold Rush began in 1849. Despite the development, intense droughts can still stress the

system and cause available water supply to fall short of demands, creating competition between water users for the limited water resources.

Figure 1: Delta Watershed Location

Geographically, the northern part of the Delta watershed is the Sacramento River watershed, through which the Sacramento River, the longest river in California, runs south over 400 miles. The Sacramento River is fed by numerous tributaries and creeks over its course, including the Pit, Feather, and American Rivers, bringing runoff from the northern Sierra Nevada to the east and Coast Mountain Ranges to the west. The southern portion of the Delta watershed is the San Joaquin River watershed, which covers the northern portion of the San Joaquin Valley. The San Joaquin River begins in the Sierra Nevada to the east and flows approximately 100 miles west before turning north for another 260 miles. The San Joaquin River contains several major tributaries, including the Merced, Tuolumne, and Stanislaus Rivers. Where the Sacramento and San Joaquin Rivers meet, they form the Sacramento-San Joaquin Delta before discharging into the San Francisco Bay and the Pacific Ocean.

The San Francisco Bay-Delta (Bay-Delta) is one of the most important ecosystems in California, as well as the hub of California's water supply system. As the largest tidal estuary on the western coast of the Americas, it provides essential habitat to a vast array of aquatic, terrestrial, and avian wildlife in the Delta, San Francisco Bay, and near-shore ocean, as well as a diverse assemblage of species upstream of the Delta. Several federal and California Endangered Species Act listed estuarine and anadromous species are found in the Delta watershed, such as delta smelt, longfin smelt, California Central Valley steelhead, Central Valley spring-run Chinook salmon, and Sacramento River winter-run Chinook salmon. Water from the Delta is also vital for humans, providing a portion of the drinking water supplies to more than two-thirds of Californians, as well as an important source of supplies for various industries and millions of acres of farmland.

Throughout the Delta watershed, numerous water agencies and irrigation districts, as well as thousands of individuals, divert water for beneficial use. Within the Delta watershed, Reclamation operates the federal CVP and DWR operates the SWP, together referred to as the Projects. The Projects include systems of dams, reservoirs, canals, and pumping plants that serve to deliver water to contractors throughout the state, generate hydropower, provide flood control, and meet other requirements to maintain water quality and minimum flows for the protection of various uses, including drinking water, agriculture, and fish and wildlife.

The CVP primarily delivers water for agricultural uses, as well as municipal and industrial uses, in the Central Valley, maintaining long-term agreements to supply water to more than 250 contractors. On average, the CVP annually delivers about 5 million acre-feet (MAF) to irrigate 3 million acres of farmland and another 600 thousand acre-feet (TAF) to serve about 2.5 million people in the Central Valley and Bay Area (Reclamation 2021a). In addition, the CVP is also required to provide 800 TAF per year

for fish and wildlife protection to mitigate the effects of the CVP and 410 TAF per year to state and federal wildlife refuges (Reclamation 2021b).

The SWP provides water supply for urban areas in the Bay Area and Southern California and for farmland in the southern San Joaquin Valley, maintaining long-term agreements to supply water to 29 contractors. On average, the SWP annually delivers about 3 MAF to serve 27 million people and 750 thousand acres of farmland (DWR 2021).

The Projects maintain major water supply and hydropower reservoirs throughout the foothills of the Delta watershed, primarily in the Sacramento Valley. The largest of these reservoirs are the CVP's Lake Shasta on the Sacramento River and the SWP's Lake Oroville on the Feather River. In addition, the CVP operates Trinity Lake outside of the Delta watershed, and imports some water from the Trinity River into the Sacramento River through the Clear Creek Tunnel. Overall, the CVP has about 12 MAF of total storage capacity, while the SWP has about 5.8 MAF of storage capacity (Reclamation 2021a, DWR 2021). From these reservoirs, water can be released when needed to meet contract demands and downstream flow and water quality requirements.

To serve contract demands located outside of the Delta watershed, the Projects export water from the Delta. While annual export amounts vary widely with water supply conditions, total exports have averaged about 4.2 MAF per year over the last 15 years (DSC 2022). These exports are made through two major pumping facilities located at the southern end of the Delta, either pumping into the California Aqueduct towards southern California or the Delta Mendota Canal to the San Joaquin Valley. Exported water may also be stored for later use in San Luis Reservoir, which is an off-stream reservoir jointly operated by the Projects.

INFORMATIVE DIGEST

Summary of Existing Laws and Regulations

California Water Rights

A water right is a usufructuary right to divert water and apply it to beneficial use. California has two primary types of surface water rights – "appropriative" and "riparian" – and each has different attributes that affect the source of water that may be diverted, the amount of water that may be diverted, when and where the water may be diverted, the authorized purposes and place of use, and the priority of right relative to other water right holders, among other parameters. Since the December 19, 1914, effective date of the Water Commission Act of 1913, development of an appropriative water right has required a water right permit issued by the State Water Board or its predecessor. Appropriative rights initiated before December 19, 1914, and subsequently perfected are called pre-1914 appropriative rights.

California's water rights priority system establishes which water right holders may divert, and how much, when there is insufficient water in the stream for all users. For appropriators, older water rights are more senior to, or have priority over, newer, more junior water rights. Senior water appropriators are more likely to be able to divert water at times of shortage than junior water right holders. However, once water is stored or imported, only the entity that stored or imported the water has a right to it, though other appropriators may acquire contingent junior rights to any abandoned or return flows. Riparian right holders, although generally senior to appropriative water right holders, are only entitled to divert natural flow. They are not entitled to divert water to storage or to redivert storage releases or imported water, or the return flows from storage releases or imported water. (*El Dorado Irrigation Dist. v. State Water Resources Control Bd*. (2006) 142 Cal.App.4th 937, 962.)

All water rights in California, including riparian and appropriative rights, are subject to overarching principles that may serve to limit water rights, including: (1) the rule that all water use must be reasonable; and (2) the public trust doctrine. (*Stanford Vina Ranch Irrigation Co. v. State of California* (2020) 50 Cal.App.5th 976, 994; *United States v. State Water Resources Control Board* (1986) 182 Cal.App.3d 82, 100.) Article X, section 2 of the California Constitution and Water Code section 100 establish the state policy that the water resources of the state are to be put to beneficial use to the fullest extent possible, and establish that rights to the use of water are limited to such water as is reasonably required for the beneficial use served, and do not extend to the waste, unreasonable use, unreasonable method of use, or unreasonable method of diversion of the water. The reasonable use doctrine applies to the diversion and use of both surface water and groundwater, and it applies irrespective of the type of water right held

by the diverter or user. (*Peabody v. Vallejo* (1935) 2 Cal.2d 351, 366-367.) What constitutes an unreasonable use, method of use, or method of diversion depends on the facts and circumstances of each case and is subject to change. (*People ex rel. State Water Resources Control Board v. Forni* (1976) 54 Cal.App.3d 743, 750.) Under the reasonable use doctrine, water right holders and claimants may be required to endure some inconvenience or to incur reasonable expenses. (*Id*. at pp. 751-752.) Water Code section 275 directs the State Water Board to take all appropriate actions before executive, legislative, or judicial agencies to implement the reasonable use doctrine.

The common law public trust doctrine requires the protection of public trust uses of navigable water bodies to the extent feasible and in the public interest. Public trust uses include navigation, commerce, fishing, recreation, and the preservation of fish and wildlife habitat. The State Water Board has a duty of continuing supervision over water rights to ensure they are exercised in a manner consistent with the public trust doctrine. (*National Audubon Society v. Superior Court* (1983) 33 Cal.3d 419.)

When the amount of water available in a surface water source is not sufficient to support the needs of existing water right holders, junior right holders must cease diversion in favor of higher-priority rights. However, existing law does not specify how to calculate when flows are unavailable for diversion; in complex water systems such as the Delta watershed, it is not always clear to a junior diverter whether there is sufficient natural and abandoned flow in the system to support their diversion and senior water uses. Diverting water when it is unavailable under a diverter's priority of right may constitute an unauthorized diversion and a trespass against the State. Under the Water code, the State Water Board may subject such violations to an Administrative Civil Liability (ACL) of up to $1,000 per day plus $2,500 per acre-foot of water illegally diverted during a drought, or such diversions could be referred to the Attorney General's office for enforcement. The State Water Board may also issue administrative cease and desist orders and request court injunctions to require that diversions stop.

Existing law allows for a departure from the priority system to the extent necessary to prevent the unreasonable diversion or use of water. (Cal. Const., art. X, § 2; *El Dorado Irrigation Dist. v. State Water Resources Control Bd.*, *supra*, 142 Cal.App.4th at pp. 965-966.) Existing law does not specify, however, whether an exception to curtailment in order of priority is warranted to ensure minimum human health and safety needs continue to be met during the current drought emergency.

Office of the Delta Watermaster

The Office of the Delta Watermaster was created as part of the Delta Reform Act of 2009. The Delta Watermaster is an independent officer of the State, reporting jointly to the Board and to the Delta Stewardship Council. Water Code section 85230 authorizes the Delta Watermaster to oversee the day-to-day administration of water rights and,

when necessary, to take enforcement action related to water diversions within the Legal Delta.[1]

Existing Diversion Measurement and Reporting Requirements

All water right holders and claimants are required to submit annual reports of water diversion and use (annual reports) to the State Water Board. The annual reports are mandatory filings that document water diversions and uses made during each month of the previous calendar year, including monthly direct diversion volumes, monthly diversion to storage volumes, and monthly water use volumes. Water right holders and claimants that divert water under statements of diversion and use also provide information about the water right claim type (e.g., riparian, pre-1914 appropriative, etc.) in annual reports.

Pursuant to regulations implementing Senate Bill 88 (SB 88, 2015), all water right diverters authorized to divert more than 10 AF annually from rivers, creeks, springs, or subterranean streams must comply with measurement requirements. There are three ways to achieve measurement compliance: (1) install, use, and maintain a device capable of measuring the rate of direct diversion; (2) propose an alternative compliance plan; or (3) utilize a measurement method for multiple diverters. SB 88 set expectations for both the accuracy of measurement devices, as well as the monitoring frequency of devices, and included measurement device installation deadlines of January 1, 2018 or earlier. Although the implementation of SB 88 has increased the frequency of required reporting for many diverters and may help to improve the quality of reported diversion and use data submitted to the State Water Board, many diverters have not yet achieved full compliance with the water right measurement requirements even though the measuring device installation deadlines have now passed.

Russian River Emergency Regulation

On May 11, 2022, the State Water Board adopted a revised emergency regulation to address ongoing drought conditions in the Russian River watershed. The Russian River emergency regulation was approved by OAL and became effective on May 31, 2022. The revised emergency regulation includes updates to address stakeholder feedback and lessons learned through implementation of the Board's emergency regulations over the past year. During the revision and readoption of that emergency regulation by the Board, minor updates were made to sections in title 23 of the California Code of Regulations that affect multiple watersheds throughout the state, including the Delta watershed. The sections of the proposed regulation for the Delta

[1] The Legal Delta is defined in Water Code section 12220. The Legal Delta is also shown on Figure 1.

watershed that were affected by those minor updates are identified below (see Policy Overview and Effect of Proposed Regulation).

In general, the Russian River emergency regulation authorizes the Deputy Director to issue curtailment orders in the Russian River watershed, requiring recipients to cease diversions unless the diversion falls under an enumerated exception or until they receive notice that the curtailment order has been lifted. Although the proposed revised regulation for the Delta watershed also addresses the need to curtail diversions during a drought emergency, it would be applicable to diversions of water in the Delta watershed only, which is geographically and hydrologically distinct from the Russian River watershed. The proposed revised regulation for the Delta watershed ensures consistency with the existing Russian River emergency regulation by using some generally applicable terms and processes.

Comparable Federal Statutes and Regulations

There is no comparable federal statute or regulation. The proposed regulation is not inconsistent or incompatible with existing state regulations.

Policy Overview and Effect of Proposed Regulation

The emergency regulation proposed this year is largely the same as the existing regulation, with some updates. The proposed revisions will improve the existing regulation to clarify requirements and allow for more efficient implementation of the regulation and Water Unavailability Methodology. Notable changes include:

1. Permissible water right demand sources were expanded to include annual water right reports from 2021 and demands reported in annual watermaster reports.
2. Ranking of supply data sources was eliminated.
3. Language was added that finds unreasonable the diversion of water made available by a reduction in diversions associated with water rights and claims held by the SRSC and FRC where the reduction is part of an operations plan for the CVP or SWP that meets certain criteria.
4. The submission deadline for proposals to correct water right priority date and proposals that curtailment is inappropriate was eliminated.
5. Language governing the submission of jointly developed alternative water sharing agreements was clarified.
6. Other minor administrative improvements were made, including correction of internal cross-references.

The intent of the proposed emergency regulation is to give the State Water Board the tools it needs in this drought emergency to more effectively:

1. Protect senior diverters;
2. Protect releases of previously stored water;
3. Ensure continued access to water supplies for minimum human health and safety needs; and
4. Obtain information from water users needed to do the above.

The proposed emergency regulation will provide more clarity to the public and water right holders and claimants regarding the information and methodology the State Water Board's Division of Water Rights will use for determining the extent to which water is unavailable for diversion at water users' different priorities of right. It also will authorize the Deputy Director to issue curtailment orders requiring recipients to cease diversions when water is unavailable under a water right holder's or claimant's priority of right unless and until: (1) they have authorization to continue diverting pursuant to one of the exceptions enumerated in the regulation, or (2) they receive notice that the curtailment order has been temporarily suspended or lifted. The emergency regulation will allow for more effective and enforceable curtailments during the drought emergency through curtailment orders that are based on a specified methodology or comparable tool for determining when water is unavailable under water right priorities—an issue of fact frequently contested in traditional enforcement proceedings to prevent unauthorized diversions—and by making the requirement to cease diversions in response to a curtailment order a regulatory requirement regardless of the curtailed user's basis of right.

The proposed emergency regulation will simplify and expedite the Board's ability to exercise its existing authority to prevent water right holders and claimants from diverting stored water releases when there is not natural or abandoned flow available under their priority of right. Enforcement of this authority will minimize the extent to which the Projects must release more stored water to compensate for downstream water users diverting storage releases intended for downstream use or needed to meet water quality and flow requirements, thereby preserving scarce water supplies for multiple purposes, including minimum human health and safety needs. The regulation will facilitate the State Water Board's implementation of the water rights priority system, obviating the need to rely on the Projects' stored water releases to both meet their intended and necessary purposes and compensate for downstream water users' diversions in excess of their rights. The regulation will prevent the unreasonable use of stored water necessary for minimum human health and safety needs while such water supplies are in danger of being depleted.

The proposed regulation also will promote the human right to water codified in Water Code section 106.3 by establishing procedures for important exceptions to curtailments based on minimum human health and safety needs. In addition, the proposed

emergency regulation will authorize the Deputy Director to issue orders requiring recipients to provide the State Water Board with information related to current and projected diversion and use of water in the Delta watershed. The emergency regulation will thus provide the State Water Board with an enforceable mechanism to obtain current year demand data to inform its water unavailability determinations.

Proposed Amended Emergency Regulation Section 876.1

Existing section 876.1 provides that the Deputy Director may issue curtailment orders in order of water right priority in the Delta watershed when natural and abandoned flows are insufficient to support all diversions. The Deputy Director will consult with and obtain the concurrence of the Delta Watermaster prior to issuing curtailment orders in the Legal Delta. This section identifies sources of sufficiently reliable information that will be considered in the Deputy Director's decisions to issue, suspend, or reimpose curtailment orders under this section. This section provides that the Deputy Director may evaluate available supplies against demands using the Water Unavailability Methodology for the Delta watershed, or comparable tools.

Under the existing regulation, on August 20, 2021, initial orders were mailed to water right holders or claimants or their agent of record on file with the Division of Water Rights. If the emergency regulation is renewed, initial curtailment and reporting orders are not planned to be redistributed via physical mail, as the initial orders previously issued remain in effect. However, additional orders related to reporting requirements may be issued if necessary. Changes in water unavailability and updates on curtailments will continue to be posted on the State Water Board's drought website and distributed to those who have signed up for the State Water Board's Delta Drought email list. Water right holders and claimants who receive an order under this section may submit information to the Deputy Director to propose a correction to a water right priority date or provide other information relevant to the issue of whether curtailment may not be appropriate. This section provides that curtailment orders are subject to administrative and judicial review.

Proposed amendments to this section consist of expanding the sources of water right demand data to include annual reports from 2021 and annual watermaster reports, as well as increasing flexibility in the use of water supply data sources as appropriate. Another minor revision updates the Water Unavailability Methodology report incorporated by reference to be the version dated June 27, 2022. Other amendments eliminate the submission deadline for proposals to correct water right priority date and proposals that curtailment is inappropriate.

This amended section also includes a new subdivision (d)(8) to address reduced water supply deliveries to the SRSC and FRC, which divert natural and abandoned flows under their own rights and receive contractual supplies from the Projects. As a result of

historic dry conditions, extremely low storage conditions in Shasta Reservoir, and the need to maintain water in storage for temperature control and minimal protection of endangered species and critical water supplies, Reclamation implemented extraordinary reductions in contractual water supplies for the SRSC during the irrigation season this year. Together with releases from Keswick Reservoir (below Shasta Dam) and carryover storage targets for Shasta Reservoir, the reductions were an integral part of Reclamation's operations plan for the Shasta Unit of the CVP. Reclamation's operations plan for the Shasta Unit was consistent with several comprehensive plans for CVP and SWP operations, including Reclamation and DWR's Drought Contingency Plan, updated on May 1, 2022, and the Interim Operations Plan (IOP), which the U.S. District Court imposed in March of this year as interim injunctive relief in Endangered Species Act litigation challenging the Biological Opinions that govern long-term operations of the CVP and SWP. Reclamation's operations plan for the Shasta Unit was also part of and outlined in the Temperature Management Plan that Reclamation developed in accordance with State Water Board Order WR 90-5, which the Board's Executive Director approved on May 6, 2022. The FRC have also been subject to substantial reductions in supplies as part of DWR's operations plan for the SWP this year in recognition of the extremely dry conditions.

The proposed subdivision would allow for demands by the SRSC and FRC not to be reduced for purposes of evaluating water unavailability if projected reductions in diversions under the contractors' underlying rights are part of an operations plan for the CVP or SWP intended to preserve limited reservoir storage in upstream reservoirs to protect cold water pools for salmon and steelhead, improve water quality, protect carryover storage, or ensure minimum health and safety water supplies. Any water unused by the SRSC and FRC under those circumstances would need to remain instream to allow Reclamation and DWR to conserve stored water supplies by minimizing the amount of water needed to be released from storage to meet flow-dependent water quality requirements below Project reservoirs and maintain salinity control and meet water quality objectives in the Delta. The proposed subdivision provides that it would be unreasonable for junior water right holders and claimants to divert any water not used by the contractors because the water would not be available but for the reduced contractual supplies and the water would need to remain instream to conserve cold water pools, improve water quality, protect carryover storage, or ensure minimum health and safety water supplies in accordance with the operations plan.

Existing Emergency Regulation Section 877.1

Existing section 877.1 defines terms used in title 23, division 3, chapter 2, article 24, such as generally applicable administrative terms and specific terms used in multiple sections like "curtailment order" and "minimum human health and safety needs." Section 877.1 also defines the terms Legal Delta, Delta Watermaster, and Sacramento-

San Joaquin Delta or Delta Watershed, which are used in other existing or amended sections of article 24.

As part of the readoption of the Russian River emergency regulation in 2022, the definition of “curtailment order” in this section was updated to clarify that a curtailment order may require the recipient to comply with regular updates to a “curtailment status list.” Some definitions that were no longer needed were removed. Additionally, the definition of “minimum human health and safety needs” was updated to clarify authorized domestic water use and water use by urban water systems. These changes apply to the Delta emergency regulation where updated definitions are also used in this regulation. No additional amendments to this section are proposed as part of this proposed readoption.

Existing Emergency Regulation Section 878

Existing section 878 provides that certain diversions for non-consumptive uses may continue after the issuance of a curtailment order, provided that a certification has been submitted to the Deputy Director. Such non-consumptive uses include direct diversions for hydropower and direct diversions dedicated for the benefit of fish and wildlife under Water Code section 1707. This section also provides that direct diversions within the Legal Delta used exclusively to irrigate lands entirely below sea level may be non-consumptive uses for purposes of this section in certain situations.

As part of the readoption of the Russian River emergency regulation in 2022, minor refinements of the language were made to clarify the definition of non-consumptive use. The change applies to the Delta emergency regulation where the updated definition is also used in this regulation. No additional amendments to this section are proposed as part of this proposed readoption.

Existing Emergency Regulation Section 878.1

Existing section 878.1 describes the procedure for a water user subject to a curtailment order to divert under an authorized exception for minimum human health and safety needs. Diversions serving such needs at a rate of 55 gallons per capita per day (gpcd) or less may proceed without further approval from the Deputy Director after submittal of a certification providing specified information to demonstrate necessity, as well as diligence in reducing water demands and seeking out alternative water supplies.

Diversions serving minimum human health and safety needs at a rate greater than 55 gpcd, or which cannot be quantified on a per capita per day basis, cannot proceed until the diverter submits a petition containing the information specified in this section and receives approval from the Deputy Director. Diversions necessary to resolve immediate human health or safety threats may proceed while a petition is being prepared or pending.

As part of the readoption of the Russian River emergency regulation in 2022, revisions were made to clarify that petitions to continue diversions are required for diversions that cannot be quantified on the basis of gpcd in addition to those that are greater than 55 gpcd. The amendments also specified that, for continued diversions for fire protection or critical hydropower, substantiating documentation may be requested by the Deputy Director. The amended section also provides for a reduced $250 filing fee for temporary urgency change and temporary transfer petitions solely for minimum human health and safety. These changes apply to the Delta emergency regulation where updated processes, definitions and conditions are also used in this regulation. No additional amendments to this section are proposed as part of this proposed readoption.

Proposed Amended Emergency Regulation Section 878.2

Existing section 878.2 provides that water right holders and claimants in the Delta watershed subject to a curtailment order may propose alternative water sharing agreements that achieve the purposes of the curtailment process described under section 876.1 as an alternative to curtailment. Proposals must demonstrate that the alternative water sharing agreement will not injure non-party legal users of water or result in an unreasonable impact on fish and wildlife. The Deputy Director may approve a proposal subject to conditions, including record keeping and reporting requirements. A proposal may be implemented pending review by the Deputy Director provided that potentially affected water right holders and claimants, including but not limited to DWR and Reclamation, concur with the proposal and no objections to the proposal are submitted to the Deputy Director. Diversions made under such proposals are subject to the terms of article 24, including reporting, compliance, and enforcement.

Proposed amendments to this section clarify that alternative water sharing agreements must be filed jointly and be explicitly agreed to by all participants.

Existing Emergency Regulation Section 879

Existing section 879 sets forth the reporting requirements for water right holders that are subject to a curtailment order, including requirements applicable to diversions under an authorized exception to curtailment. This section requires recipients of initial orders to submit certifications regarding their diversion and use. In addition, it provides that the Deputy Director may require water right holders and claimants with an authorized face value or recent annual reported diversion amount of 1,000 AF or greater to provide information on prior diversions and demand projections for subsequent months. The Deputy Director will consult with and obtain the concurrence of the Delta Watermaster prior to requiring such information in the Legal Delta. This section also provides that the Deputy Director, or the Delta Watermaster for rights in the Legal Delta, may issue informational orders requiring water right holders, diverters, or users to provide additional information related to a diversion and use of water in the Delta watershed,

such as: the basis of right with supporting documents or other evidence; property patent date for the place of use; the date of initial appropriation; anticipated or actual water transfer amounts; or other information relevant to forecasting demands and supplies and determining compliance with curtailment orders in the current drought year or in contingency planning for continuation of the current drought emergency. Information provided in accordance with an informational order may inform curtailment decisions under this regulation but is not intended for other purposes.

As part of the readoption of the Russian River emergency regulation in 2022, amendments were made to subdivisions that pertain to the Russian River watershed only. As a result of those changes, the subdivision pertaining to the Delta watershed was renumbered from subdivision (d) to (c), and other administrative updates were included to ensure consistency with the rest of the regulation. No additional amendments to this section are proposed as part of this proposed readoption.

Existing Emergency Regulation Section 879.1

Existing section 879.1 provides that compliance with title 23, division 3, chapter 2, article 24 is a condition of all water right permits, licenses, certificates, and registrations for diversions from any watershed identified in that article.

As part of the readoption of the Russian River emergency regulation in 2022, a new subdivision (b) was added to this section to allow continued diversions after issuance of a curtailment order, provided that the maintenance of a mechanism allowing for the bypass of natural or abandoned flow is not a condition of the water right permit, license, stockpond certificate, or registration and the authorized face value of the right does not exceed 10 AF per year. This change applies to curtailment orders issued under the Delta emergency regulation as well. No additional amendments to this section are proposed as part of this proposed readoption.

Existing Emergency Regulation Section 879.2

Existing section 879.2 clarifies the compliance obligations of a diverter in the event the diverter is subject to overlapping or conflicting requirements under title 23, division 3, chapter 2, article 24. It also clarifies authorities under which the State Water Board may pursue enforcement for violations of article 24.

As part of the readoption of the Russian River emergency regulation in 2022, this section was amended to clarify and consolidate applicable enforcement authorities. The section also amends subdivision (b) to provide that, in cases where consent is withheld for an inspection to assess compliance with article 24, the Board may obtain an inspection warrant pursuant to the procedures in title 13. The change applies to the Delta emergency regulation as well. No additional amendments to this section are proposed as part of this proposed readoption.

Existing Emergency Regulation Section 879.3

Existing section 879.3 provides express authorization for the redelegation of authorities granted to the Deputy Director to aid the Division of Water Rights in carrying out the duties created by title 23, division 3, chapter 2, article 24 more efficiently. This section was added during readoption of the Russian River regulation in 2022 but applies to the Delta emergency regulation as well. No additional amendments to this section are proposed as part of this proposed readoption.

Documents Incorporated by Reference

The proposed regulation identifies that the Water Unavailability Methodology for the Delta Watershed report dated June 27, 2022 is incorporated by reference. The June 27, 2022 version of the report describing the Water Unavailability Methodology also includes appendices A, B, C, and D. The Water Unavailability Methodology report is incorporated by reference due to its length (approximately 150 total pages) and its inclusion of maps and graphs, which would be cumbersome, unduly expensive, and impractical to reproduce in the regulation. The report is available on the State Water Board's Delta Water Unavailability Methodology webpage at: https://www.waterboards.ca.gov/drought/drought_tools_methods/delta_method.html.

Data and Methodology for Issuing, Suspending, and Reimposing Curtailments

The following sections describe the data and methodologies that may be used to support the issuance of curtailment orders for the Delta watershed pursuant to section 876.1 of the regulation and for the suspension and reimposition of curtailment orders.

The regulation would authorize the Deputy Director to rely upon the Water Unavailability Methodology, as described in a report dated June 27, 2022, or a comparable tool, for curtailment decisions. An overview of the Water Unavailability Methodology is provided below. The Water Unavailability Methodology is also described in more detail in the Water Unavailability Methodology for the Delta Watershed report dated June 27, 2022. The Water Unavailability Methodology summary report, technical appendices, spreadsheet, and water unavailability visualization tool are available at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/drought_tools_methods/delta_method.html.

The Water Unavailability Methodology compares the best available estimates of supply and demand within the Sacramento and San Joaquin River watersheds and within delineated subwatersheds to determine if supply may be insufficient to meet certain priorities of right. The State Water Board may develop these estimates using the sources and methods described in the Water Unavailability Methodology report, as well

as any other pertinent, reliable, and publicly available information. The following sections summarize the sources of the supply and demand data used within the methodology to date, as well as additional sources that may be incorporated, such as sub-monthly supply data that may enable to the Board to temporarily suspend curtailment orders in light of precipitation or runoff events, demand data obtained from 2020 or 2021 annual reports of water diversion and use and annual watermaster reports, and projected demand data provided by large diverters pursuant to section 879, subdivision (c)(2) of the emergency regulation. The following sections also describe adjustments made to the supply and demand data, as needed, and the output of the supply and demand comparisons. Since its initial release in May 2021, the methodology has been updated to address public comments and to make other appropriate refinements, and it may be updated further as new information becomes available. Due to the uncertainties that exist in determining water unavailability in the Delta watershed, conservative assumptions that would result in fewer curtailments were used within the methodology itself and will also be used in the methodology's implementation.

Water Supply Estimates

Water in a stream system may consist of a combination of natural flows, imported supplies, storage releases, abandoned flows, and return flows. The Water Unavailability Methodology supply analysis only accounts for the natural and abandoned flows within the Delta watershed available for diversion by water right holders and claimants under their own water rights. The Water Unavailability Methodology does not account for supplies imported to the Delta watershed from other watersheds or for releases of previously stored water for downstream uses, as those supplies would be unavailable to other users under their own water rights. In the case where previously stored water is released to meet instream flow requirements that apply in an upstream subwatershed, but not a downstream subwatershed, and the water is not released for delivery to a downstream user, these flows are considered to be abandoned and part of available supplies in the downstream subwatershed. Return flows are not explicitly represented as water supplies but are instead incorporated by reducing demands for direct diversion because the amount of return flow introduced back into the system is in proportion to the magnitude of diversion.

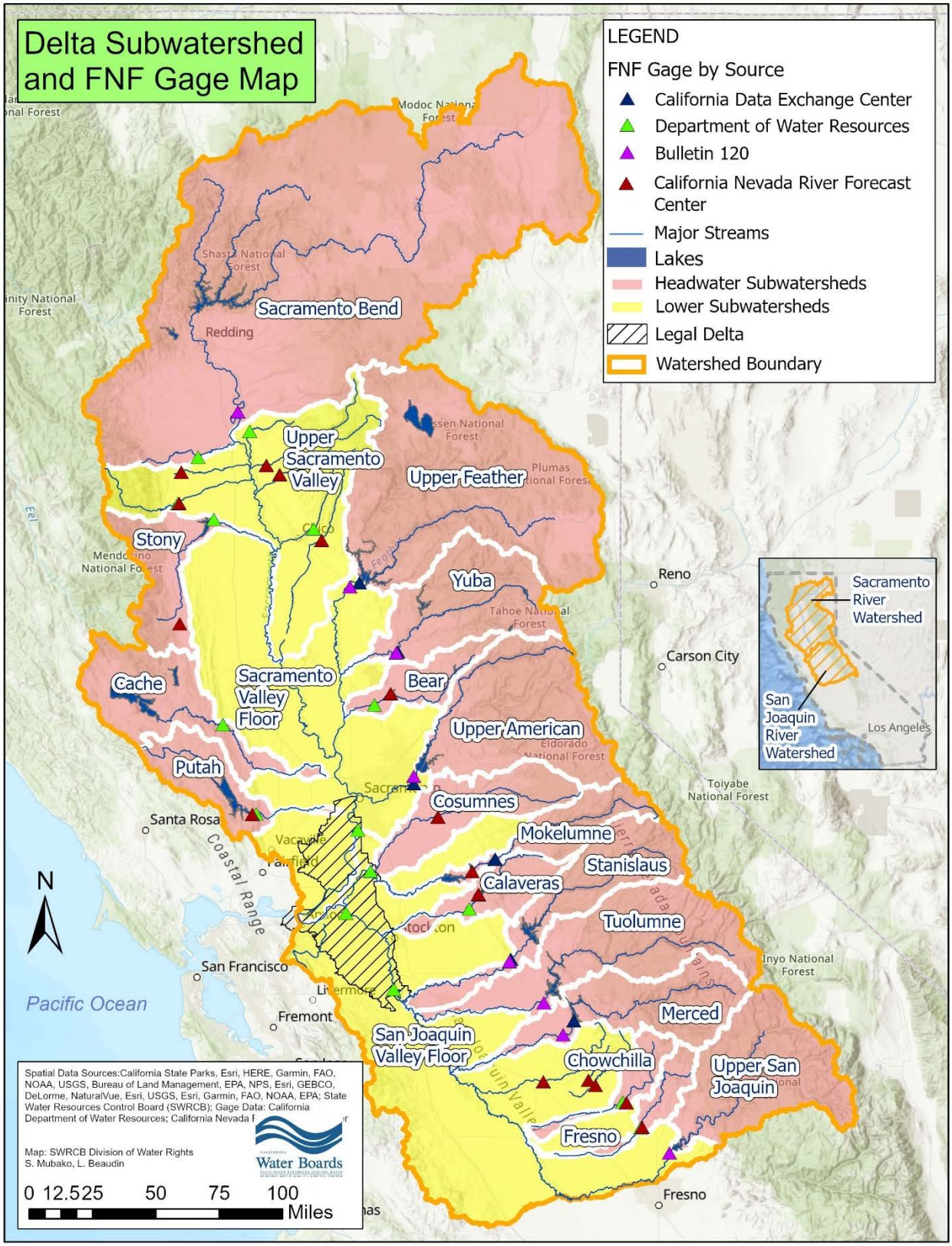
The methodology for determining available water supplies incorporates past and projected future full natural flow (FNF) (or unimpaired flow) estimates and assumes all FNF is available for diversion. (Although the methodology assumes all FNF is available for diversion, section 876.1, subdivision (d)(8) of the regulation would create an exception for any water unused by the SRSC or FRC in accordance with an operations plan for the CVP or SWP that meets certain criteria, as discussed above.) FNF is a theoretical water supply estimate representing the natural water production of a river

basin unaltered by upstream water diversion, storage, or import from or export to other watersheds (DWR 2015). Historical FNF is calculated from measured streamflow, adjusted for upstream operations by subtracting imported water and adding upstream diversions, changes in storage, and evaporative losses. Forecasted future FNF is predicted based on snowpack measurements, estimates of water content, expected weather, rates of evaporation, ground absorption, and other factors. Because future water supply cannot be predicted with absolute certainty, FNF forecasts generally provide a range of possible water supply volumes given current conditions. From this range of values, probabilities of occurrence associated with different supply values can be calculated. Probabilities are expressed in exceedances, or the percent chance that the future FNF will exceed a given amount.

Subwatershed Delineation

Spatially, the Water Unavailability Methodology includes estimates of available supply at a subwatershed level. Subwatershed boundaries were defined using the U.S. Geologic Survey (USGS) Watershed Boundary Dataset (WBD) and National Hydrography Dataset (NHD), which delineate land areas draining to streams. Subwatersheds within the Delta watershed were generally established based on Hydrologic Unit Code level 8 watersheds (HUC8s), which represent areas of sufficient size to capture as much of the available flow as possible within the watershed given the existing locations of FNF estimates. Some subwatershed boundaries were defined as a combination of multiple HUC8s due to the presence of multiple HUC8s upstream of a single FNF gage location. These subwatersheds include the Sacramento River above Bend, the Upper American River, and the Upper Feather River. Some HUC8s containing small tributaries on the valley floor were also combined into a single subwatershed due to the use of these boundaries for supply estimates produced by DWR, including the Upper Sacramento River Valley, Sacramento River Valley Floor, and San Joaquin Valley Floor subwatersheds. Due to the presence of some demands not met by local supplies within their HUC8 boundaries, the Mokelumne, Chowchilla, Fresno, and Calaveras River subwatersheds were instead delineated as a combination of smaller Hydrologic Unit Code level 10 (HUC10) watersheds and stream buffers. A total of 20 subwatersheds are used in the Water Unavailability Methodology: 10 each in the Sacramento and San Joaquin River watersheds. Figure 2 shows the location and boundaries of the subwatersheds, as well as the location of the FNF estimates.

Figure 2: Delta Subwatershed and FNF Gage Map



Supply Data Sources

Because there is no single data source that provides both past and forecasted monthly FNF estimates for the entire Delta watershed, supply data is derived from multiple sources which vary by location, timescale (i.e., historical data, including prior months of the current water year, and future forecasted data), and temporal resolution (i.e., daily or monthly). For past supply data, the data sources are considered hierarchically; that is, if data for a particular subwatershed is not available from the preferred data source, the next source is used if available, and the next after that. The sources of past FNF supply data, in order of preference, are: 1) the California Data Exchange Center (CDEC); 2) DWR's Estimates of Natural and Unimpaired Flows for the Central Valley of California: Water Years 1922-2014 report (DWR 2016); and 3) the National Oceanic and Atmospheric Administration (NOAA) National Weather Service California Nevada River Forecast Center (CNRFC) estimates of daily FNF. For forecasted supply data, the methodology can use both daily CNRFC forecasts, which reflect expected hydrologic conditions over the short-term (7 to 14 days), and monthly Bulletin 120 (B-120) water supply forecasts issued by DWR from December through May. As proposed, either forecast is equally available for use in a manner that best suits current conditions.

As data from the above sources is not perfect, data gaps may remain for some subwatersheds. These gaps can include periods of missing data when none of the sources above reported any values or data that represents only a portion of the FNF in a subwatershed because not all streams within the subwatershed had data available. Where there are no reported values for a period of time for a subwatershed, the values are extrapolated based on the data of a nearby subwatershed with similar hydrology that has data during the missing time period. This is done by calculating the ratio of monthly FNF between the two subwatersheds for time periods of overlapping data, then multiplying the data from the neighboring subwatershed for the missing time period by the extrapolation ratio. Where past or forecasted data is available but does not represent the entire FNF supply of a subwatershed, the data is augmented by correlating the available data with data from another source that represents the entire subwatershed but may not cover the period in question. This is done by calculating the ratio of monthly FNF between the two sources for time periods of overlapping data and then multiplying the available but incomplete data by the augmentation ratio.

Abandoned Instream Flows

The last step in preparing the supply dataset is to incorporate the contribution of abandoned storage releases for instream flows. Current data limitations do not provide for a precise accounting of when instream flow requirements that can be considered abandoned have been met by releases of previously stored water. Therefore, to incorporate abandoned instream flows into the supply dataset without artificially inflating

estimates of available supply by assuming all abandoned instream flows have been met by releases of stored water, the methodology uses the greater of the FNF value or the abandoned instream flow value to represent the amount of supply contribution of the subwatershed to the respective watershed-wide supply. In other words, it is assumed that if the FNF is greater than the instream flow requirement then the requirement is being met by FNF; conversely, if the instream flow requirement is greater than the FNF then it is assumed that the requirement is met, at least in part, by storage releases which can be considered abandoned below the intended reach. In addition, for determining the contribution of abandoned instream flows to the supply, all abandoned instream flows whose intended reach ends near the bottom of a subwatershed are considered. To avoid double counting of additional supplies, the methodology does not currently account for instream flows that end higher up in the subwatershed. To account for the limitation on riparian rights to the diversion of only natural flow and not flow that is foreign in either time or source, the Water Unavailability Methodology allocates any portion of the incorporated instream flow requirements in excess of FNF to only non-riparian diverters.

Demand Dataset

The Water Unavailability Methodology evaluates the demands for natural and abandoned flows in the Delta watershed by basis and priority of water right. It is not intended to account for demands for previously stored water, imported supplies, or contractual demands. For this analysis, water demand is generally based on diversion data acquired from the State Water Board's Electronic Water Rights Information Management System (eWRIMS) computer database. The eWRIMS database system contains information on water rights throughout the state, including monthly diversion data filed in annual reports by water right holders.

The Water Unavailability Methodology includes estimates of monthly water demand based on the total monthly diversion amount reported for each water right record in the watershed, including monthly direct diversions and monthly diversions to storage. Currently, data from calendar year 2018, the most recent drier year (below normal) for which quality-controlled demand data is available, is used, except in cases where reliable updated information is available. Adjustments to this dataset can be made as appropriate based on updated reliable demand projections, including data submitted as part of the enhanced reporting requirements under the emergency regulation and other reliable sources. Diversion data from 2018 is primarily used because it is the first drier year for which quality-controlled diversion data is available since updated water right measurement and reporting requirements went into effect with SB 88 (see Existing Diversion Measurement and Reporting Requirements). Updates to enhanced reporting of projected demands are planned to allow larger diverters over 1,000 AF annually to only provide updated projected demand data if they determine that the data used in the

methodology should be updated. These updates are expected to reduce the reporting burden which is expected to increase compliance, while preventing the need for reporting by all users in order to use the updated data.

Selection of Water Right Records

All currently active water rights and claims of right which divert natural flow within the Delta watershed are included in the methodology. However, demands are only quantified for those classified as appropriative (including post-1914 appropriative water rights) or statements of diversion and use (including pre-1914 appropriative and riparian claims). Minor water right types, such as registrations and stockponds, are included in the demand dataset but are assumed to constitute a negligible amount of the water diversion and use within the Delta watershed; therefore, all demand values for those records have been set to zero. Exclusion of those demands represents a conservative assumption because it underestimates overall demand and results in fewer curtailments. Currently, the demand dataset includes approximately 17,000 total water right records, including 6,000 appropriative water rights (including permits and licenses), 7,000 statements of diversion and use, and 4,000 additional minor water rights (such as registrations and stockponds).

Non-consumptive uses, such as for hydropower generation, may change the timing of flows but do not reduce the amount of supply available unless they result in an interbasin diversion. However, during the wet season, non-consumptive water rights that divert water to storage can make water unavailable for other users for periods of time greater than the temporal resolution of the analysis (e.g., weekly or longer). Therefore, diversions to storage under non-consumptive rights such as hydropower rights are included in the demand dataset only during the wet season to accurately reflect where these diversions make water unavailable within a month.

Quality Control

Water right diversion data contained within annual reports is self-reported and is not systematically verified for accuracy upon receipt. As a result, staff conducted an internal review and quality control effort following the selection of water right records. Due to the number of water right records included in the demand dataset, the scope of the initial quality control and review effort was narrowed to focus on the largest diversions in the Delta watershed, including appropriative water rights with a face value (maximum diversion amount) of 5,000 AF annually or greater and statements of diversion and use with reported diversions of 5,000 AF annually or greater. These records account for approximately 90 percent of the water diverted in the Delta watershed but less than 10 percent of water users. For this narrowed subset of records, the diversion data from 2018 and 2019 annual reports were then reviewed for reporting inaccuracies and errors. Any errors identified were replaced with the best estimates of the actual diversion values. These estimates were determined based on supplemental

information available within the annual reports and the eWRIMS database or, in some cases, additional information received by contacting the water right holder or their agent. In addition, approximately 100 post-1914 appropriative rights were identified that reported diversions less than 5,000 AF annually but in excess of the face value of the water right. For these records, the reported diversion amounts were updated to equal the face value of the water right. State Water Board staff have worked with water right holders to correct the demand dataset, including instances of duplicative reporting, and will continue to do so as those issues are identified.

State Water Board staff have initiated an expanded quality control effort encompassing appropriative water rights with a face value of 1,000 AF annually or greater and statements of diversion and use with reported diversions of 1,000 AF annually or greater in either calendar year 2018 or 2019, which accounts for approximately 800 additional water right records. To further provide for improvements in demand projections for these users, users are planned to be given the opportunity to provide updated projected demand data as discussed above.

Disaggregation of Diversion Amounts

Diversion amounts reported by water users are disaggregated into direct diversions and diversions to storage. Spatially, demand values within the demand dataset were aggregated at the same subwatershed scale as the supply values within the supply dataset. For most water right records, all associated points of diversion (PODs) are geographically located within a single subwatershed. However, some water right records have PODs spanning multiple subwatersheds. For these records, demands for direct diversion and storage under each water right record were split among the applicable subwatersheds based on the proportion of the total active PODs diverting natural flow located within each subwatershed. Demands were split differently based on the nature of each POD associated with the right – direct diversion demands were split among PODs that divert directly, while storage demands were split among PODs that divert to storage. For water rights or claims with multiple PODs, an apportionment of demand based on the actual amounts diverted at each POD is not possible at this time because water diversion and use information is typically reported by water right and not for individual PODs.

Project and Contractor Demands

Diversions by the Projects present unique situations, so the Water Unavailability Methodology treats these demands differently than other water rights in the demand dataset. Specifically, diversions by the Projects for uses outside of the Delta watershed are subject to area of origin protection, which prohibits the Projects from diverting for purposes of exporting natural and abandoned flows needed for uses within the Delta watershed. In recognition of area of origin protection, most Project water rights are assumed to have the lowest priority date in the Delta watershed. Given the extreme dry

conditions and associated limited exports out of the Delta watershed by the Projects, this assumption may be modified in the future to only assign the portion of Project demand that is exported out of the watershed a lower priority date and to assign the remaining diversions for inbasin purposes the actual water right priority date. However, changes to Project right priority dates do not have a significant effect on the analysis given the Projects' relatively junior water right priority apart from area of origin protection. In addition, some water rights with PODs in the Delta watershed represent demands for CVP water imported from the Trinity River. These water rights and corresponding diversion data were removed from the demand dataset because the water associated with these diversions is imported to the Delta watershed and does not impact natural flow supplies in the watershed. The methodology also accounted for a reduction in Project demands in May and June 2022 in accordance with the State Water Board's April 4, 2022 order approving the TUCP jointly filed by the Projects, which limited Delta exports. Additional adjustments may be made in the future as appropriate.

The Projects divert and store water for use by contractors both within and outside of the Delta watershed. These contractors include entities that do not have their own basis of right and those that have their own bases of water right that may also receive supplemental contract supplies (referred to here as settlement contractors). Settlement contractors entered into contracts with the Projects to resolve water right disputes related to construction of the Projects. These contracts are not synonymous with the underlying rights but are instead negotiated agreements. Various water users in the Delta watershed have settlement-type contracts with DWR and Reclamation that provide contractual entitlements of a certain supply to these users. As mentioned previously, as a result of very dry hydrologic conditions this year DWR has reduced scheduled deliveries to FRC that have a settlement-type contract to 50 percent of their full contract amount. In addition, pursuant to Reclamation's operations plan for the CVP, deliveries to the SRSC have been reduced to 18 percent of their full contract amount. These reductions extended to diversions by the SRSC and FRC of natural and abandoned flows under their own rights, as well as their rediversion of imported or previously stored Project water delivered pursuant to their contracts. Accordingly, the demands associated with the water rights and claims of the SRSC and FRC were modified in the demand dataset to reflect the reduction in diversions by the SRSC and FRC. These demands will be adjusted as appropriate if section 876.1, subdivision (d)(8) of the proposed emergency regulation discussed above is approved or based on other reliable information consistent with the emergency regulation.

Additional adjustments to the demand dataset may be made for the San Joaquin River Exchange Contractors. In most years, the Exchange Contractor demands are met with CVP water supplies from the Delta. However, this year, the Exchange Contractors have received a portion of their demand from the San Joaquin River and a portion from the

Delta. Exchange Contractor demand assumptions have been, and are planned to continue to be, adjusted to account for such changes in supplies as appropriate.

Return Flows

Return flows are water that is diverted and then returned to the river as part of agricultural and urban uses. The volume of return flows from agriculture varies based on type of use, crop type, location, soils, and season. Urban return flows are primarily comprised of treated effluent from wastewater treatment plants. In recognition that only a portion of diversions are consumptively used due to return flows from irrigation and, to a lesser extent, municipal uses, a return flow factor is applied to diversion values within the demand dataset.

Rates of return flow can be estimated using models developed to simulate surface and groundwater hydrology. Monthly return flow factors were calculated for the Sacramento and San Joaquin River watersheds using model results from a CalSim 3[2] public release. For each watershed, the sum of return flows from all valley floor demand units (DUs) was divided by the sum of surface water diversions to all valley floor DUs to obtain a return flow factor. Demand factors, which demands are multiplied by to produce reduced demand values accounting for return flows, are equal to one minus the return flow factor for the respective watershed and month. For example, if the return flow factor for a watershed in a given month is 0.2, or 20%, the demand factor applied in that watershed for that month would be 0.8, or 80%. Within CalSim 3, return flows result from all sources of water delivered to a given DU, including directly diverted surface water, previously stored surface water, and pumped groundwater. While return flow factors are not applied to diversions to storage, the CalSim-derived return flow data itself does incorporate return flows associated with demands met from previously stored water. Assuming these flows contribute to return flows is a conservative assumption.

Due to the extreme dry conditions this year, and possibly next irrigation season, planting of agricultural lands and associated irrigation in the Sacramento Valley is substantially reduced relative to a typical irrigation season and reuse of tailwater is likely to be maximized. In particular, return flows in the Sacramento Valley that are dominated by rice irrigation are likely to be substantially reduced in areas drained by the Colusa Basin Drain. Consequently, return flow assumptions used in the Water Unavailability Methodology during water year 2022 may be informed by supplementary analyses incorporating the best available information regarding land use, recycling of applied water, and actual gaged return flow data where available.

[2] CalSim 3 is a hydrologic simulation model developed by DWR and Reclamation that includes representation of the Sacramento and San Joaquin River watersheds, including estimates of return flows.

Exclusion of Curtailment Exceptions

Pursuant to the existing and proposed emergency regulations, water users can seek an exception to curtailment for several reasons. These include diversions for minimum human health and safety needs, diversions for non-consumptive uses that do not decrease downstream flows in the watershed, diversions made in accordance with alternative water sharing agreements that achieve the same results as curtailment, and other proposals that curtailment is inappropriate and would not make water available to serve senior downstream water rights and claims.

Of these exceptions to curtailment, only those for minimum human health and safety needs represent a net consumptive use of water. State Water Board staff have analyzed the quantity of water associated with the minimum human health and safety exceptions received to date and have found that they represent a negligible quantity of water for the most part. The demand resulting from this exception has not been incorporated into the demand dataset due to this largely negligible quantity and because its exclusion favors fewer curtailments. Demands associated with the exceptions will continue to be evaluated and substantial, significant exceptions may be incorporated into the demand dataset in the future, if appropriate.

Evaluation of Available Supplies Against Demands

The Water Unavailability Methodology compares supply and demand at two different spatial levels, at the headwater subwatershed level and at the watershed-wide (Sacramento or San Joaquin) level. Demands within headwater subwatersheds can only be met by supply originating within the subwatershed itself, whereas demands in a downstream subwatershed can be met by the local supply within that subwatershed, as well as supply from upstream subwatersheds. Using both comparisons allows for water unavailability to be determined based on local supply and for the accounting of senior demands that may have priority to divert that supply further downstream.

If demand in a headwater subwatershed exceeds the available supply, the excess demand is eliminated from the larger watershed-wide analysis. As a result, demand that cannot be met by physically available supplies is not charged against supplies from elsewhere in the Delta watershed. Furthermore, if the headwater subwatershed analysis indicates that the total demand of riparian claimants exceeds the available supply in a particular headwater subwatershed, that headwater subwatershed's supplies and demands are removed from the watershed-wide analysis for the given period. In other words, it is assumed that the given stream would not have continuity with the larger Delta watershed due to fulfillment of local senior water right demands.

Diverters with appropriative water rights with PODs within the Legal Delta may have access to water supplies entering from both the Sacramento and San Joaquin River

watersheds.[3] To account for this, appropriative demands within the Legal Delta are divided between the two watersheds based on the monthly proportion of connected supply available from each watershed. For example, if the Sacramento River watershed contributes 80 percent of the connected supply within the Delta watershed for a given month, 80 percent of Legal Delta appropriative demand is charged against Sacramento River watershed supply for that month and 20 percent is charged against San Joaquin River watershed supply. Supply ratios for Sacramento and San Joaquin River watersheds are based on past or forecasted FNF values at the same exceedance level selected for use in determining water unavailability for each watershed.

Supply and demand data produced using the Water Unavailability Methodology can be visually compared using the Water Unavailability Visualization Tool. The Water Unavailability Visualization Tool is available at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/drought_tools_methods/delta_method.html.

For this visual comparison, demands are sorted by water right priority, with riparian demand at the bottom of the graphs, followed by pre-1914 appropriative demand and post-1914 appropriative demand, which are grouped by priority decade. Project demands are the most junior and are stacked at the top.

While monthly supply and demand datasets are planned for use in determining when the issuance of curtailment orders is appropriate, for the purposes of sub-monthly short-term considerations of curtailment suspensions due to precipitation and runoff events, sub-monthly data will be considered to ensure that curtailments are suspended on a time step commensurate with available supplies. However, water unavailability analyses for the purpose of issuing curtailments in the Legal Delta are not performed on a timestep any shorter than 30 days (i.e., monthly). The State Water Board will continually evaluate the need to discontinue curtailment orders based on forecasted or actual precipitation and runoff that does, or is expected to, result in a measurable increase to available supplies.

Need for Enhanced Reporting and Informational Orders During the Drought Emergency

The existing emergency regulation requires water right holders and claimants in the Delta watershed to certify that they will take actions needed to comply with initial

[3] Consistent with the analysis contained in State Water Board Order WR 89-8, the Water Unavailability Methodology assumes that riparian claims do not have access to supply outside the watershed where they are located (i.e., a riparian claim along the San Joaquin River in the Legal Delta does not have a right to divert natural or abandoned flow of water originating from the Sacramento River).

curtailment or reporting orders issued under the emergency regulation. Under the emergency regulation proposed for renewal in 2022, submission of the one-time certification would not be required again for water right holders and claimants who have already complied with the requirement.[4] However, under section 879, subdivision (c)(1) of the proposed emergency regulation, completion of the certification would be required for those water right holders and claimants that have not yet complied with the requirement, as well as new recipients of an order due to a change in ownership of a water right or claim.

As discussed above, the demand dataset currently used in the Water Unavailability Methodology is generally derived from 2018 reported diversion data. Although the demand dataset that is based on historical reported diversions represents the best information currently available for estimating demands under specific water rights, refinements to those demand estimates may be warranted, particularly during the precipitation and runoff period when there is a desire by water right holders and claimants to replenish severely depleted reservoir storage. Historical diversion data in the demand dataset does not reflect demand that was not met, increased demand that exists due to the drought-related extreme low reservoir levels, or other specific demand variations that exist within particular years.

To address these issues, the existing emergency regulation authorizes the Deputy Director to require enhanced monthly reporting of past diversions and projected demands in order to use that data to refine demand estimates and otherwise inform curtailment decisions. In order to minimize the burden on the majority of water right holders in the Delta watershed that are smaller and may have more limited abilities to report on a regular basis, these reporting provisions only apply to the largest diversions in the Delta watershed, including those with a total authorized face value or recent annual reported diversion amount of 1,000 AF or greater. The Deputy Director's authority for requiring this reporting would not change under the emergency regulation proposed for renewal in 2022.

Additionally, as with the existing emergency regulation, the regulation proposed for renewal would provide authority to the Deputy Director to issue orders requiring reporting of additional information about water rights and claims to inform curtailment decisions, such as information regarding the basis of claims of water right. Pre-1914 appropriative and riparian claims of right are not permitted by the State Water Board or, in most cases, validated by a court. As such, there may be instances in which additional information is needed related to these claims to inform curtailment decisions. Additional information may also be needed from post-1914 appropriative right holders to address specific issues that may arise with implementation of curtailments, such as

[4] Certification forms have been filed for approximately 75 percent of the water rights and claims within the Delta watershed.

where water is planned to be diverted under water rights that have PODs in different subwatersheds. This information may be used to improve the demand dataset for implementing the methodology, and may inform curtailment decisions, but is not intended for other purposes.

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Mandate on Local Agencies or School Districts

The proposed emergency regulation does not impose a mandate on local agencies or school districts because it does not mandate a new program or a higher level of service of an existing program. The regulation is generally applicable to public and private entities and is not unique to local government. No state reimbursement is required by part 7 (commencing with section 17500) of division 4 of the Government Code.

Suspension of CEQA

As stated above, Governor Gavin Newsom issued a proclamation on May 10, 2021, addressing the drought state of emergency in all counties in the Delta watershed. Among other things, the proclamation suspended CEQA for certain actions, including the State Water Board's adoption of an emergency regulation to curtail diversions in the Delta watershed when water is not available under the diverter's priority of right and to protect releases of stored water. On March 28, 2022, Governor Newsom signed an executive order acknowledging the continued drought conditions throughout the State, extending the authorities and directives of the May 2021 proclamation, and calling for increased conservation efforts. CEQA is therefore suspended as to the readoption of this regulation.

Cost Estimate

The fiscal effects resulting from the proposed emergency regulation are the costs that would be incurred by state and local government agencies to respond to any requirements therein, pursuant to Government Code section 11346 et seq. A Fiscal Impact Statement has been prepared in accordance with State Administrative Manual sections 6600-6616.

The fiscal effect on local and state government agencies as a result of the proposed renewed emergency regulation includes the costs: (1) to complete and submit certification forms that have not yet been submitted; (2) to prepare ongoing diversion and projected demand reporting on a monthly basis; (3) resulting from curtailments due to exceptions to priority-based curtailments for minimum human health and safety needs; and (4) resulting from curtailments due to the protection of foregone diversions by the SRSC or FRC in accordance with an operations plan that meets specified criteria.

The State Water Board estimates the total cost to all state and local agencies (including city, county, schools, and publicly owned water suppliers) due to the proposed emergency regulation to be $28.4 million. The total reporting costs for state and local agencies to complete and submit outstanding compliance certification forms from 2021 and ongoing diversion and projected demand reporting is estimated to be $11.3 million.

The human health and safety exception to curtailment is estimated to result in a net fiscal savings of up to $151.4 million. The protection of foregone diversions by the SRSC and FRC is estimated to result in a fiscal impact of up to $168.5 million. The overall total fiscal impact to state government is estimated to be up to $69.9 million, and the fiscal impact to local government is estimated to be a net savings of up to $41.5 million.

The State Water Board conservatively estimates the cost to all state and local governmental agencies due to the emergency regulation will be $107,250 to complete the mandatory certification forms, and $11.1 million to provide ongoing diversion and projected demand reporting.

The minimum human health and safety exception to curtailments could result in additional costs to water users who must curtail diversions to ensure water is available for health and safety purposes under rights and claims that would have otherwise been curtailed. The fiscal effect on state and local government is the cost that would result from additional curtailments of rights and claims held by state or local government entities needed to allow diversions for minimum health and safety uses under more junior rights to continue. Currently, the demand associated with the minimum human health and safety exception to curtailment is not incorporated into the demand dataset of the water unavailability methodology used to determine curtailments in the Delta watershed due to the relatively small quantity of water it represents, which results in fewer curtailments. The assumption in the fiscal analysis that this demand would be factored into the analysis resulting in more curtailments represents a conservative assumption in the event that the Board does decide to factor these demands into the analysis at a point in the future if the exceptions are significant enough that such a change is warranted.

Under this scenario, the minimum human health and safety exception is conservatively estimated to result in fiscal savings of up to $151.4 million. The total conservatively estimated decreased revenue and increased costs ranges from $40.7 million to $57.1 million. This consists of a reduction in agricultural and municipal water agency revenues from lost water sales of $7.3 million to $16.3 million and a corresponding reduction in state and local tax revenues ranging from $0.7 million to $1.6 million. There is also estimated to be additional loss in state and local tax revenue that could range from $7.1 million to $18.6 million associated with reduced agricultural production resulting from the additional curtailed agricultural supply. Agricultural and municipal water agencies may also incur estimated water replacement costs of $25.5 million to $20.6 million. The fiscal effect on state and local government that will result from government agencies being able to continue to divert a quantity of water by relying upon the human health and safety exception is an estimated net savings of $208.5 million. This consists of: 1) an increase of $189.6 million in water agency revenue from allowing

human health and safety diversions to occur rather than these diversions being curtailed; and 2) an increase of $19.0 million in corresponding state and local tax revenues. These are increases in revenues that result from the human health and safety exception that would not occur if these diversions were curtailed.

Section 876.1, subdivision (d)(8) of the proposed emergency regulation provides for the use of monthly demand projections based on historic diversions for water rights and claims held by SRSC and FRC notwithstanding reductions to contractual supplies associated with operational plans for the CVP and SWP designed to conserve water upstream later in the year in order to protect cold water pools for salmon and steelhead, improve water quality, protect carryover storage, or ensure minimum health and safety water supplies. Section 876.1, subdivision (d)(8) finds that the diversion by junior right holders or claimants of any water projected to be unused by the SRSC or FRC is unreasonable under such circumstances as this water would not be available absent the reduced contractual supplies, and the water would need to remain instream to conserve cold water pools, improve water quality, protect carryover storage, or ensure minimum health and safety water supplies in accordance with the operations plan. The maintenance of SRSC and FRC demands notwithstanding the reduction in contractual supplies would result in additional costs to water users who could be required to curtail diversions due to the protection of the water unused by the SRSC and FRC. The fiscal effect on state and local government is the cost that would result from additional curtailments of rights held by state or local government entities due to the protection of this water.

The impacts under this provision are conservatively estimated to amount to decreased revenue and increased costs totaling $138.0 million to $168.5 million. This consists in part of a reduction in agricultural and municipal water agency revenues from lost water sales of $28.5 million to $45.9 million and a corresponding reduction in state and local tax revenues of $2.9 million to $4.6 million. There is also estimated to be additional loss in state and local tax revenue that could range from $31.6 million to $55.1 million associated with reduced agricultural production resulting from the additional curtailed agricultural supply. Agricultural and municipal water agencies may also incur estimated water replacement costs of $75.1 million to $63.0 million.

The proposed regulation is not anticipated to have a fiscal impact on school districts or to result in costs or savings in federal funding to the State.

Appendix 1 details how these costs were estimated.

APPENDIX 1: FISCAL IMPACT STATEMENT

APPENDIX 1 TABLE OF CONTENTS

Summary of Fiscal Effect on Local and State Government

The fiscal effects resulting from the proposed emergency regulation are the costs that would be incurred by state and local government agencies to respond to any requirements therein, or otherwise due to the requirements therein, and the savings to state and local government agencies, pursuant to Government Code section 11346 et seq. This Fiscal Impact Statement has been prepared in accordance with State Administrative Manual sections 6600-6616.

The fiscal effect on local and state government agencies as a result of the proposed renewed emergency regulation includes the costs: (1) to complete and submit certification forms that have not yet been submitted; (2) to prepare ongoing diversion and projected demand reporting on a monthly basis; (3) resulting from curtailments due to exceptions to priority-based curtailments for minimum human health and safety needs; and (4) resulting from curtailments due to the protection of foregone diversions by the Sacramento River Settlement Contractors (SRSC) or Feather River Contractors (FRC) in accordance with an operations plan that meets specified criteria.

The State Water Resources Control Board (State Water Board or Board) estimates the total cost to all state and local agencies (including city, county, schools, and publicly owned water suppliers) due to the proposed emergency regulation to be $28.4 million. The total reporting costs for state and local agencies to complete and submit outstanding compliance certification forms from 2021 and ongoing diversion and projected demand reporting is estimated to be $11.3 million. The human health and safety exception to curtailment is estimated to result in a net fiscal savings of up to $151.4 million. The protection of foregone diversions by the SRSC and FRC is estimated to result in a fiscal impact of up to $168.5 million. The overall total fiscal impact to state government is estimated to be up to $69.9 million, and the fiscal impact to local government is estimated to be a net savings of up to $41.5 million.

The State Water Board conservatively estimates the cost to state and local governmental agencies will be $107,250 to submit and complete the certification forms outstanding from 2021, and $11.1 million to provide ongoing diversion reporting.

The minimum human health and safety exception to curtailments could result in additional costs to water users who must curtail diversions to ensure water is available for health and safety purposes under rights that would have otherwise been curtailed. The fiscal effect on state and local government is the cost that would result from additional curtailments of rights held by state or local government entities to allow diversions for minimum health and safety uses under more junior rights to continue.

The impacts that could be caused by the human health and safety exception are conservatively estimated to amount to decreased revenue and increased costs totaling $40.7 million to $57.1 million. This consists of a reduction in agricultural and municipal

water agency revenues from lost water sales of $7.3 million to $16.3 million and a corresponding reduction in state and local tax revenues ranging from $0.7 million to $1.6 million. There are also estimated to be additional losses in state and local tax revenue that could range from $7.1 million to $18.6 million associated with reduced agricultural production resulting from the additional curtailed agricultural supply. It is also estimated that agricultural and municipal water agencies would incur water replacement costs of $25.5 million to $20.6 million. The fiscal effects on state and local governments that are estimated to result from government agencies being able to continue to divert a quantity of water by relying upon the human health and safety exception is a net savings of $208.5 million. This consists of: 1) an increase of $189.6 million in water agency revenue from allowing human health and safety diversions to occur rather than these diversions being curtailed; and 2) an increase of $19.0 million in corresponding state and local tax revenues. These are reductions in costs that state and local governments would otherwise incur absent the health and safety exception.

The provision of the emergency regulation, section 876.1, subdivision (d)(8), that would prevent reductions in SRSC and FRC demands could result in deeper curtailments and therefore additional costs to water users who must curtail diversions.

The potential fiscal impact of this provision is conservatively estimated to amount to decreased revenue and increased costs totaling $138.0 million to $168.5 million. This consists of a reduction in agricultural and municipal water agency revenues from lost water sales of $28.5 million to $45.9 million and a corresponding reduction in state and local tax revenues of $2.9 million to $4.6 million. There is also estimated to be an additional loss in state and local tax revenue that could range from $31.6 million to $55.1 million associated with reduced agricultural production resulting from the additional curtailed agricultural supply. Agricultural and municipal water agencies may also incur estimated water replacement costs of $75.1 million to $63.0 million. The proposed regulation is not anticipated to have a fiscal impact on school districts or to result in costs or savings in federal funding to the State.

In this report, costs and revenues are presented in millions of dollars that are rounded to the hundred thousand (e.g., $1.3 million for $1,300,000). The values in the underlying spreadsheet used to calculate the values in the tables are not rounded, and therefore some subtotals in the report tables may not sum exactly.

Fiscal Costs of Proposed Reporting Requirements

The fiscal effect on local and state government agencies as a result of the proposed reporting requirements includes the costs: (1) to complete and submit certification forms that have not yet been completed; and (2) for larger users to prepare ongoing diversion and demand projections on a monthly basis. The time and effort required to submit certification forms where they have not already been completed, and to prepare monthly

reporting is considered an additional cost of compliance for these water right holders and claimants.

The cost estimates are conservative because most water right holders and claimants have already submitted certification forms pursuant to the 2021 Delta curtailment and reporting regulation and associated initial orders. Those who have already submitted forms pursuant to 2021 orders will not be required to do so again. In addition, most water right holders and claimants are already required to comply with measurement and reporting regulations that went into effect with Senate Bill (SB) 88 (2015-16). Pursuant to regulations implementing SB 88, all water right diverters authorized to divert more than 10 AF annually from rivers, creeks, springs, or subterranean streams must comply with measurement requirements. There are three ways to achieve measurement compliance: (1) install, use, and maintain a device capable of measuring the rate of direct diversion; (2) propose an alternative compliance plan; or (3) utilize a measurement method for multiple diverters. SB 88 set expectations for both the accuracy of measurement devices as well as the monitoring frequency of the device and included a measurement device installation deadline of January 1, 2018, or earlier. It is likely that costs for measuring diversions associated with reporting under the proposed regulation overlap with existing SB 88 requirements because diverters are already subject to existing measurement requirements.

Curtailments themselves (and associated costs to diverters) are already part of the existing prohibition against unlawful diversion and associated Board authority. All other costs of the regulation would be the same as for curtailments issued by the Board under its current authorities because local and state governments would need to comply in essentially the same manner.

The estimated cost of the requirement to submit the certification form is associated with changing from a request for information to a mandated obligation to submit the information. The Board determined the total number of state and local government agencies in the Delta watershed and multiplied that number by an estimated average time to complete a simple online certification form multiplied by an average staff cost per hour.

Based on information compiled from the State Water Board’s eWRIMS database, water right holders and claimants representing approximately 17,000 water rights and claims received an initial order and are required to submit a certification form. As of June 2022, the compliance certification form has not been submitted for approximately 4,000 water rights and claims. Among those, it is estimated that approximately 1,650 may be held by state, local, and district/agency entities. The estimated maximum amount of time to complete the required certification form as a result of the proposed regulation is one hour of staff time per water right record at an assumed pay rate of $65 per hour. The

cost burden on local and state governmental agencies for this requirement is therefore about $107,250 in total.

Water right holders and claimants who have been issued an initial order and whose water right or claim has a total authorized face value or recent annual reported diversion amount of 1,000 acre-feet (AF) or greater may be required to submit monthly information regarding prior diversions and demand projections. Currently, in accordance with the Deputy Director's discretion under section 879, subdivision (c)(2) of the emergency curtailment and reporting regulation, monthly reporting of diversions and projected demand is only required for water rights and claims with a face value or recent annual reported diversions of 5,000 AF or greater. However, changes to projected demand reporting forms are planned for the near future to (1) only require reporting if water users with diversions of 5,000 AF or greater believe that their current demand projections are not accurately reflected by their previously reported diversions, which have already been incorporated into the methodology's demand dataset and (2) allow reporting by users down to 1,000 AF. While additional water users may report as a result of these changes, the planned changes are expected to reduce the amount of time and effort to complete the forms by all water users. The analysis below represents a conservative estimate of the fiscal impact to state and local governments assuming that all water right holders and claimants with a face value or recent annual reported diversion of 1,000 AF or greater will complete all the reporting, which likely will not be necessary for many water users for which the methodology's existing demand dataset is representative.

Approximately 1,731 water right records in the Delta watershed have a total authorized face value or recent annual reported diversion amounts of 1,000 AF or greater and may be subject to the monthly reporting requirement, including approximately 45 state and 504 local and district/agency water rights. This reporting requirement would require monthly reporting if the regulation is in effect; this is up to one year, unless the Board readopts the regulation due to continued drought conditions or repeals the regulation due to improved hydrologic conditions. For these diverters, the monthly reporting is assumed to require both analytical and senior staff time. The first month is assumed to require the most effort, including three working days of time for mid-level staff compiling and organizing hydrologic data, plus one working day of senior staff review. The remaining eleven months of the regulation are each assumed to require one working day of mid-level staff plus a half-day of senior staff time. The estimated average daily cost is assumed to be $800 for mid-level staff and $1,400 per working day for senior staff. Therefore, the cost for twelve months of reporting is estimated at $20,300 per water right or claim owned by a state or local government entity. For the approximately 549 state and local governments, this represents a total estimated cost of $11.1 million.

The total estimated maximum costs to state and local government agencies as a result of the proposed reporting requirements is $11.3 million.

Fiscal Costs of Human Health and Safety Exception

This section presents the methods used to estimate the fiscal effects on state and local government that could result from implementation of exceptions to curtailments for minimum human health and safety needs in the Delta watershed. A range of values is estimated that depends upon the extent of replacement groundwater pumping that may occur. The period covered by the regulation is assumed to be one year (365 days) from date of enactment. The proposed emergency regulation includes an exception from curtailments for minimum human health and safety needs. The State Water Board does have quasi-adjudicative authority and enforcement discretion that it could employ to achieve similar results; however, implementation on a watershed-wide scale is not likely feasible without the emergency regulation. This analysis conservatively assumes that exceptions to curtailments for minimum human health and safety needs would only be made pursuant to the regulation and would not occur without the emergency regulation.

Currently, the demand associated with the minimum human health and safety exception to curtailment is not incorporated into the demand dataset of the water unavailability methodology used to determine curtailments in the Delta watershed due to the relatively small quantity of water it represents. The exclusion of this demand favors fewer curtailments. However, demands associated with the minimum human health and safety exception to curtailment will continue to be evaluated and substantial, significant exceptions may be incorporated into the methodology's demand dataset in the future, if appropriate. The following analysis represents a conservative estimate of the fiscal impact to state and local governments under a scenario in which all demands associated with the minimum human health and safety exception to curtailment are included in the water unavailability methodology's demand dataset and factored into the determination of curtailments.

To determine the fiscal effects of including the human health and safety exception, this analysis identifies the maximum amount of water that could continue to be diverted under a health and safety exception. Implementation of the human health and safety exception could require additional curtailments of other water right holders that would not otherwise have been curtailed. Under a scenario in which demand associated with the human health and safety exception is incorporated into the water unavailability methodology's demand dataset and results in an impact to curtailments, there would be two types of fiscal effects observed:

1. Costs to state and local governments as a result of additional curtailments needed to facilitate the human health and safety exception; and

2. Savings to state and local governments that would otherwise be curtailed if they could not continue to divert by way of a human health and safety exception to curtailment.

The exceptions to curtailments for minimum human health and safety needs are specified in section 877.1, subdivision (h) of the emergency regulation, and section 878.1 provides further information regarding implementation. The standard exception would provide for diversion of water for minimum human health and safety needs of no more than 55 gallons per person per day.

Approach to Analysis of the Fiscal Effects of the Human Health and Safety Exception

The underlying method used to determine the fiscal effect of the human health and safety exception on state and local governments is to determine the maximum likely number of people in the affected region whose domestic and municipal use rely on: 1) surface water rather than groundwater; and 2) direct diversion of surface water rather than releases from storage.

The potentially affected population to be served by water exempted from curtailment for human health and safety needs is multiplied by 55 gallons per person per day, and by 365 days, to determine the maximum possible quantity of additional water that could be subject to further curtailment to allow for this demand to continue. This amount is then reduced to reflect the ability of these surface water users to rely on alternative sources of water such as groundwater pumping. The final net additional curtailment needed to satisfy the human health and safety exception is the amount of water that water right holders, who would not have otherwise been curtailed, must cease diverting to accommodate human health and safety diversions under junior water rights. To determine the effect on state and local government, eWRIMS is used to determine the percent of public water agencies (i.e., local government agencies) that could be potentially affected by the additional curtailment. This percent is assumed to be evenly distributed amongst all water rights. The fiscal effect on state and local government is comprised of the following elements:

1. A reduction in agricultural and municipal water agency revenues from lost water sales;
2. A corresponding reduction in state and local tax revenues;
3. Loss in state and local tax revenue associated with reduced agricultural production resulting from curtailed agricultural supply; and
4. Water replacement costs to agricultural and municipal water agencies.

There is also a fiscal savings to state and local governments that can continue to use water for human health and safety needs that would have been curtailed absent the human health and safety exception. This fiscal savings is calculated by determining the quantity of water and the number of state and local agencies that may use the human health and safety exception to continue to divert water when they would otherwise be curtailed.

The Delta watershed is comprised of the Sacramento River and San Joaquin River watersheds. Because of hydrologic and other differences between the Sacramento River watershed and the San Joaquin River watershed, the fiscal effects are analyzed and presented separately.

Changes in Water Requirement Due to the Human Health and Safety Exception

Drinking water for the nearly 40 million residents of California (2020 estimate, California Department of Finance) is provided from a combination of groundwater and surface water sources. Of those, about 27 million, or two-thirds, receive a portion of their water supply from the State Water Project (SWP) (DWR 2021). The Central Valley Project (CVP) delivers about 600,000 acre-feet per year of surface water from direct diversion or storage releases for municipal use (Reclamation 2021). Assuming an average use of 192 gallons per person per day (for overall municipal use, not just residential use), the CVP serves 2.8 million residents).[1] In recognition of area of origin protection, CVP and SWP (collectively, Project) water rights that serve water uses outside of the area of origin (which does not include New Melones), are assumed to have the most junior priority date among Delta watershed rights. As a result, when curtailments are in effect, CVP and SWP water supplied to their contractors outside of the Delta watershed is likely to be from stored water, not direct diversion. In addition, most of these contractors have other sources of supply. Since these water suppliers have access to a portfolio of options for replacement of curtailed surface water, they would likely not have a need to continue diversions pursuant to a human health and safety exception. As such, the population outside of the Delta watershed, served by Project rights, is not considered in this analysis.

It is estimated that the municipal utilities servicing residents in California obtain approximately 40% of their supply from surface water diversions during drought years (Carle 2004). This proportion appears to be similar in the Sacramento and San Joaquin River watersheds among water providers. The population of the Sacramento River watershed is approximately 4.1 million residents, and 40% of that total is about 1.654 million persons. Based on a conservative assumption that providers of these 1.654 million residents face limited replacement options, then total human health and safety

[1] Calculated as (192 gallons per capita per day * 365 days / 325,851 gallons per acre-foot) / 600,000 acre-feet = 2,789,820 persons

curtailments of approximately 102,000 acre-feet would be the maximum required among water right holders and claimants in the Sacramento River watershed.[2]

The population of the San Joaquin River hydrologic region is approximately 2.3 million residents (California Water Resilience Portfolio, 2020). Additionally, the City and County of San Francisco holds pre-1914 appropriative water right claims within the San Joaquin River watershed. Diversions made pursuant to these claims serve populations outside of the Delta watershed under Public Water Systems (PWSs) CA3810001 and CA5500031. According to the State Water Board's Division of Drinking Water Drinking Water Watch Portal, PWSs CA3810001 and CA5500031 serve populations of 2,600,600 and 500, respectively. For the purpose of this analysis, the population served by diversions within the San Joaquin River Watershed (excluding Project diversions) is assumed to be approximately 4.9 million. Forty percent of 4.9 million is just under 2.0 (1.96) million persons. Total human health and safety curtailments of approximately 121,000 (120,752) acre-feet would be the maximum required among water right holders and claimants in the San Joaquin River watershed. This represents a conservative assumption because it is highly unlikely that the water rights and claims associated with the water supplies for all of these residents would be curtailed, curtailed for an entire calendar year, or that all of these municipal providers would not have or be able to obtain an alternate source of supply, such as groundwater or previously stored supplies, that would obviate a need to rely on the human health and safety exception to serve these minimum human health and safety needs. For example, the emergency regulation requires all diverters seeking an exception for minimum human health and safety to exercise all feasible alternate sources of water, such as groundwater and previously stored water, prior to diverting under an exception to curtailment.

Several other simplifying assumptions are included in this analysis because of the uncertainty regarding exactly where curtailments will occur, how many may be needed, and where any curtailment exception for human health and safety purposes would be needed. This analysis is assumed to present a conservatively high estimate of the costs and savings of the human health and safety exception to curtailments in the Delta watershed.

Estimates of the Distribution of Source Water for the Human Health and Safety Exception

In order to determine the fiscal impacts of the human health and safety exception, the fiscal analysis includes assumptions about the types of additional water use that are expected to be curtailed to allow for continued diversions of water for human health and safety needs. The fiscal impacts of curtailments vary based on the type of use being

[2] 1.654 million residents * 55 gallons per capita per day * 365 days / 325,851 gallons per acre-foot = approximately 102,000 acre-feet.

curtailed, primarily between agricultural and urban uses. For the purpose of this analysis, agricultural water use is assumed to have one average value and domestic is assumed to have another.

To estimate the relative percentage of agricultural versus domestic and other use, and the relative percentage of state and local governments that may be affected, the analysis is based on eWRIMS data from the Delta watershed. Agricultural irrigation use represents approximately 87 percent of water diverted from the watershed, with domestic and other uses accounting for the remaining 13 percent. Of the water used for agriculture, 94 percent was provided by public agencies (e.g., irrigation districts) with the remaining 6 percent being provided by private entities. Of the water used for domestic and other uses, 93 percent was provided by public agencies (e.g., municipalities) with the remaining 7 percent being provided by private entities. Based on these percentages, the 102 thousand acre-feet (TAF) maximum curtailment in the Sacramento River watershed is assumed to be comprised of 83 TAF of agricultural, 12 TAF of municipal (that are not otherwise accruing the benefit of human health and safety diversions under this regulation), and 6 TAF of various private diverters (see Table 1). Similarly, the 121 TAF maximum curtailment in the San Joaquin River watershed would be comprised of 99 TAF of agricultural, 15 TAF of municipal, and 7 TAF of private diverters.

Table 1. Assumed Maximum Curtailment Required from Diverters for Human Health and Safety Exception (acre-feet)

	Sacramento River Watershed	San Joaquin River Watershed
Maximum Curtailment	101,899	120,752
Agricultural – public	83,333	98,751
Municipal – public	12,320	14,599
Private diverters	6,246	7,402

Changes in Quantity of Water Available for Sale by Public Agencies Due to the Human Health and Safety Exception

Reductions in surface water available for diverters being curtailed as a result of the human health and safety exception would likely be offset to some extent by increased groundwater pumping and water purchases (short-term leases). The net loss in water available for sale by public agencies is the amount of curtailed water they cannot replace in this fashion.

The time required to construct new wells is generally greater than the timeframe for the emergency regulation but pumping from existing wells may be increased to replace a portion of the supplies reduced by curtailments. As not all affected water right holders

will have access to additional groundwater pumping, however, only a portion of the curtailed water can be replaced by additional pumping. In addition, the Sustainable Groundwater Management Act (SGMA) may result in restrictions on the amount of replacement groundwater available. Agricultural users are more likely to respond to curtailments with groundwater replacement pumping and fallowing, while municipal and urban users tend to have more capacity to trade water and to implement short term conservation.

A 2015 UC Davis report (Howitt et al., 2015) on the economic effects of the drought contained an analysis and projection of the amount of replacement groundwater pumping by region that would likely be used by agriculture, based on groundwater pumping records and interviews with irrigation districts. The report estimated that 52 percent in the Sacramento River watershed and 76 percent in the San Joaquin River watershed of curtailed surface water would be replaced by additional groundwater pumping. Although drought conditions in 2015 were somewhat different than current conditions, there are enough similarities to use these projections for estimates. One key difference from 2015, however, is the implementation of SGMA, which may result in less groundwater replacement in many locations and overall. This suggests that the use of the estimates from the 2015 UC Davis report would be high and may overstate contemporary groundwater replacement levels for agriculture.

Previous analyses (e.g., 2014 emergency regulations) have estimated that only 20 percent of public agricultural water supply can be replaced by groundwater pumping during the curtailment period. This modest level of replacement has the effect of greater reduction in overall water supply, reduced agricultural production, and smaller sales of irrigation district water to growers. For the remainder of this analysis, a range of costs is presented that represents the range between high and low levels of replacement water assumptions.

Municipal groundwater replacement rates are assumed to range from 40 to 50 percent in the Sacramento River watershed, and 20 to 50 percent in the San Joaquin River watershed. In the latter case, the lower bound rate (20 percent) is used to account for the larger presence of critically dry groundwater basins. Municipalities are also anticipated to implement voluntary (or possibly mandatory) conservation measures that are consistent with their Urban Water Management Plans and past responses to drought conditions. For this analysis, it is assumed that 20 percent of their surface water supply curtailment would be absorbed by water conservation and would not need to be replaced, a target similar to the drought in 2015 (PPIC, 2015, p. 8).

Water transfers and leases between agricultural districts and growers, among municipalities, and between agriculture and municipal providers, are serving an increasingly prominent role in the Central Valley. It is assumed that 5 percent of agricultural supply and 10 percent of municipal supply reductions can be replaced by

additional purchases or water transfers (personal comm., Medellin-Azuara 2014). These replacement percentages are generally consistent with recent historic levels of water transfers during past periods of drought.

Tables 2 and 3 provide a summary of the net reductions, in AF, of water supply available for public agricultural and municipal water agencies being curtailed and the amount available for municipal agencies under the human health and safety exception. This does not include net reductions in supply for private diversions.

Table 2. Agricultural Agency and Irrigation Districts Net Curtailment, Human Health and Safety Exception (acre-feet)

	Sacramento River Watershed	San Joaquin River Watershed
Surface Water Supply Curtailment (Maximum) (AF)	83,000	99,000
Groundwater Replacement (Range of %)	20%–52%	20%–76%
Water Transfer and Leases	5%	5%
Net Reduction (AF)	62,250–35,719	74,250–18,724

Table 3. Municipal Water Provider Net Curtailment, Human Health and Safety Exception (acre-feet)

	Sacramento River Watershed	San Joaquin River Watershed
Surface Water Supply Curtailment (Maximum) (AF)	12,000	15,000
Conservation	20%	20%
Groundwater Replacement (Range of %)	40%–50%	20%–50%
Water Transfer and Leases	10%	10%
Net Reduction (AF)	3,600–2,400	7,500–3,000

As shown in Table 2, the volume of groundwater replacement that may take place has a significant effect on the net reduction in overall water supply for agricultural producers. A similar circumstance is evident for municipal providers, as shown in Table 3. As water diversions that would otherwise have been curtailed continue, further curtailments may be required of additional agricultural and municipal public agencies, and to the extent water made unavailable by these further curtailments can be replaced by those agencies, there is an effective net increase in the total amount of water available to

public agencies across the State and a net decrease in water available to agricultural water agencies. In effect, water is being curtailed from diverters who do not have a human health and safety need, to the benefit of municipal agencies that have no ability to find alternative sources for those minimum amounts necessary to serve those human health and safety uses. Also, and strictly from the perspective of public agencies, the curtailment of private diversions pursuant to this regulation may have the effect of increasing water available for public agencies (see Table 4). Therefore, the fiscal analysis takes into consideration that the human health and safety exception could allow more water to be sold by the agencies that receive an exception than they would otherwise sell if the exception were not in place.

Table 4. Net Change in Water Available for Public Agencies, Human Health and Safety Exception (thousand acre-feet)

	Sacramento River Watershed		San Joaquin River Watershed	
	Low*	High*	Low*	High*
Increased Volume of Water Available for Municipal Sale	102	102	121	121
Agricultural Agency	-62	-36	-74	-19
Municipal	-3.6	-2.4	-7.5	-3.0
Net Change in Water Supply	36	64	39	99

* “Low” versus “high” extent of groundwater replacement for curtailed surface water (see Tables 2 and 3).

Fiscal Impacts to Public Water Supply Agencies, Human Health and Safety Exception

Fiscal impacts to both public agricultural and municipal water agencies are assumed to result primarily from changes in water sales revenues and increased water replacement and conservation costs. These are calculated below by applying unit sales and cost values to the supply change estimates developed above.

Change in Public Agency Water Sale Revenues, Human Health and Safety Exception

Estimates of the price of water charged by public agricultural and municipal water supply agencies were developed based on an informal review of agency rates and previously developed public information. These prices are then applied to the net change in water available for sale as calculated and presented above in Table 4. This

provides an estimate of the total associated change in revenue to these agencies. Table 5 presents the estimated change as ranges based on extent of groundwater replacement. The results indicate that there is a greater reduction in water sales revenues to agricultural and municipal agencies associated with lower groundwater replacement. However, when accounting for the human health and safety exception to curtailment, the net effect for public agencies is positive.

Table 5. Net Change in Public Agency Water Sales Revenues, Human Health and Safety Exception ($ million)

	Rate ($) per AF	Sacramento River Watershed		San Joaquin River Watershed	
		Low*	High*	Low*	High*
Increased Municipal Agency Water Sales	$850	$86.7	$86.7	$102.9	$102.9
Agricultural Agency	$50	-$3.1	-$1.8	-$3.7	-$0.9
Municipal	$850	-$3.1	-$2.0	-$6.4	-$2.6
Net Change in Revenues		$80.5	$82.9	$92.8	$99.4

* “Low” versus “high” extent of groundwater replacement for curtailed surface water (see Tables 2 and 3).

Increased Public Agency Water Supply Replacement and Conservation Costs, Human Health and Safety Exception

State and local agricultural and municipal agencies affected by curtailments pursuant to the proposed regulation are anticipated to pump groundwater and purchase additional supplies to replace a portion of their reduced surface water supplies. These agencies will also likely need to implement conservation and enforcement measures to address the shortages that remain after obtaining such replacement water.

The cost of replacing curtailed surface water diversions with groundwater will be primarily the energy costs associated with the additional pumping. Based on prevailing energy rates and groundwater depth and other information contained in the SWAP[3] agricultural economics model, an average of $95 per acre-foot of additional cost is assumed for replacement water obtained in this manner; this reflects an upward adjustment to account for much higher energy costs due to inflation that are facing

[3] SWAP (Statewide Agricultural Production Model (SWAP, Howitt et al. 2012)

agencies and the public in general (BLS June 2022). The cost of leasing replacement surface water from willing sellers is assumed to be $750 per acre-foot in the Sacramento River watershed and $1,000 per acre-foot in the San Joaquin River watershed.

Public agencies are also anticipated to incur costs associated with conservation and enforcement measures needed to address the overall shortage of water available for use in their service areas. The costs of implementing these measures are estimated to be $30 per acre-foot and $165 per acre-foot for the shortage amounts within the public agricultural and municipal water agency service areas, respectively (pers comm., Medellin-Azuara 2014).

Table 6. Net Change in Public Agency Water Supply Replacement and Conservation Costs, Human Health and Safety Exception ($ million)

	Rate ($) per AF of Water	Sacramento (Sac) River Watershed		San Joaquin (SJ) River Watershed	
		Low*	High*	Low*	High*
<u>Agriculture</u>					
Additional Groundwater Pumping	$95	$1.6	$4.1	$1.9	$7.2
Water Transfers	$750 (Sac) $1,000 (SJ)	$3.1	$3.1	$5.0	$5.0
Conservation and Enforcement	$30	$1.9	$1.1	$2.2	$0.6
<u>Municipal</u>					
Additional Groundwater Pumping	$95	$0.5	$0.6	$0.3	$0.7
Water Transfers	$750 (Sac) $1,000 (SJ)	$0.9	$0.9	$1.5	$1.5
Conservation and Enforcement	$165	$0.6	$0.4	$1.2	$0.5
Net Change in Costs		$8.5	$10.1	$12.1	$15.4

* “Low” versus “high” extent of groundwater replacement for curtailed surface water (see Tables 2 and 3).

Summary of Total Fiscal Impact to Public Water Supply Agencies, Human Health and Safety Exception

The total maximum fiscal impact to public agricultural and municipal water supply agencies (e.g., irrigation districts and municipalities) resulting from both decreased water sales and increased replacement and conservation costs are summarized in Table 7. It should be emphasized that these impacts represent the maximum potential impact, and the actual impact may be far less if fewer municipal water agencies require continued diversions to meet minimum human health and safety needs, notwithstanding curtailment, than are assumed in this analysis.

Table 7. Summary of Total Fiscal Impact on Public Water Supply Agencies, Human Health and Safety Exception ($ million)

	Sacramento River Watershed		San Joaquin River Watershed	
	Low*	High*	Low*	High*
Municipal Water Providers	$81.7	$82.8	$93.5	$97.6
Agricultural Agencies	-$9.7	-$10.1	-$12.8	-$13.6
Net Change in Revenues	$72.0	$72.7	$80.7	$84.0

* “Low” versus “high” extent of groundwater replacement for curtailed surface water (see Tables 2 and 3).

Changes to State and Local Government Tax Revenues, Human Health and Safety Exception

Changes to government tax revenues would be expected due to increased public agency water sales and reduced agricultural production sales (revenue) resulting from the curtailments associated with this emergency regulation.

Tax Revenue Impacts from Changed Public Agency Water Sales

Increased overall water sales by public water agencies as described above will result in higher associated government income tax revenues. An estimated tax rate was applied to the increased public agency revenues to determine the corresponding impact on government income tax revenues. An average tax rate of $99 per $1,000 was estimated using an IMPLAN[4] model for the region. This is an estimate of the impact primarily on

[4] Economic impact analysis software - IMPLAN (http://www.implan.com).

income taxes collected by state government and local governments; however, it does not include a breakdown of these two categories or consider indirect and induced economic effects.

Table 8 provides a summary of impacts on tax revenues from changes in sales by municipal water providers and agricultural agencies. For municipal providers, the change results from *increased* sales of water by suppliers to meet minimum human health and safety needs as compared to if those suppliers' right to continue diversions were curtailed, and decreased sales for those not utilizing the exception. Agricultural agencies would experience decreased sales. Overall, the exception would lead to an increase in state and local tax revenues.

Table 8. Net Change in Tax Revenues due to Changes in Agency Sales Revenues, Human Health and Safety Exception ($ million)

	Tax rate	Sacramento River Watershed		San Joaquin River Watershed	
		Low*	High*	Low*	High*
Change Due to Increased Municipal Agency Water Sales		$86.7	$86.7	$102.9	$102.9
Change in Curtailed Municipal Provider Sales		-$3.1	-$2.0	-$6.4	-$2.6
Change in Agricultural Agency Sales		-$3.1	-$1.8	-$3.7	-$0.9
Applicable tax rate	10%				
Net Change in Tax Revenues		$8.1	$8.3	$9.3	$9.9

* "Low" versus "high" extent of groundwater replacement for curtailed surface water (see Tables 2 and 3).

Tax Revenue Impacts from Reduced Agricultural Production, Human Health and Safety Exception

Agricultural production sales revenue by growers could be negatively affected as irrigation surface water supplies are reduced by further curtailments than would occur without the minimum human health and safety needs exception. Reduced agricultural production in turn would reduce associated income tax revenues. An analysis of the impact of curtailments on agricultural gross revenue was performed by multiplying an estimate of the amount of agricultural revenue generated per acre-foot of applied water by the total amount (from both public and private sources) of irrigation water that may be reduced as a result of further curtailments than would occur without the minimum

human health and safety needs exception. The estimate of revenue per acre-foot of applied water was developed by calculating a weighted average of cropping patterns and acreage, irrigation water requirement, and revenue per acre across SWAP model geographic units covering the Sacramento River watershed and San Joaquin River watershed, respectively. The gross revenue per acre-foot in the Sacramento River watershed is estimated at approximately $1,200 per acre-foot, and approximately $1,500 per acre-foot in the San Joaquin River watershed. Revenue per acre-foot of applied water varies throughout the region, and an average value provides a reasonable, if conservative, estimate that assumes curtailment affects all irrigated lands equally. This estimate likely overstates impacts as it does not factor in the likelihood that growers fallow lower revenue crops first as water becomes scarcer, or that water transfer activity may increase in drought conditions. In either case, lower revenue crops may predominate any acreage decrease, making the impact smaller. The same income tax rate developed above is then applied to this reduction in agricultural production to estimate the associated impact to income tax revenues. Table 9 provides a summary of the impact (decrease) on state and local tax revenues in the Sacramento River watershed and San Joaquin River watershed.

Table 9. Change in Tax Revenue as a Result of Reduced Agricultural Production, Human Health and Safety Exception ($ million)

	Sacramento River Watershed		San Joaquin River Watershed	
	Low*	High*	Low*	High*
Change in Irrigation Supply (TAF)	-62	-36	-74	-19
Product Gross Revenue ($) per acre-foot	$1,200	$1,200	$1,500	$1,500
Change in Agricultural Production Sales ($ million)	-$74.7	-$42.9	-$111.4	-$28.1
Net Change in Tax Revenues @ 10% ($ million)	-$7.5	-$4.3	-$11.1	-$2.8

* “Low” versus “high” extent of groundwater replacement for curtailed surface water (see Tables 2 and 3).

Summary of Total Tax Revenue Impacts, Human Health and Safety Exception

The total impact on income tax revenues resulting from both increased public agency water sales and reduced agricultural production are summarized in Table 10. This is an estimate of impacts mainly on income taxes collected by state and local governments. This represents an upper bound tax revenue impact based on the curtailment estimates presented in this analysis, with actual impacts likely being less depending on actual curtailments. Also, fiscal support to local agencies from the State could in turn be affected, but such tax and funding relationships between the State and numerous local agencies are difficult to characterize and cannot be readily estimated. The proposed regulation is not anticipated to result in costs or savings in federal funding to the State.

Table 10. Total Tax Revenue Impacts, Human Health and Safety Exception ($ million)

	Sacramento River Watershed		San Joaquin River Watershed	
	Low*	High*	Low*	High*
Due to Net Change in Municipal Agency Water Sales ($ million)[5]	$8.1	$8.3	$9.3	$9.9
Due to Reduced Agricultural Product Sales ($ million)[6]	-$7.5	-$4.3	-$11.1	-$2.8
Net Change in Tax Revenues	$0.6	$4.0	-$1.9	$7.1

* “Low” versus “high” extent of groundwater replacement for curtailed surface water (see Tables 2 and 3).

Fiscal Costs of the Protection of Foregone Diversions by SRSC and FRC

This section presents the methods used to estimate the fiscal effects on state and local government that would result from the protection of foregone diversions associated with reduced contractual supplies to the Sacramento River Settlement Contractors and the Feather River Contractors.

As a result of the very dry hydrologic conditions this year, DWR has reduced supplies to FRC in accordance with their respective contract deficiency provisions. This can generally be classified as a 50 percent reduction compared to full contract amounts,

[5] From Table 8, the sum of “Change Due to Increased Municipal Agency Water Sales” and “Change in Curtailed Municipal Provider Sales.”
[6] From Table 9, “Net Change in Tax Revenues.”

though diversions to riparian parcels are not subject to reduction under the contract deficiency provisions and supplies may exceed 50 percent of the full contract amount depending on the individual contractor. In addition, pursuant to Reclamation's operations plan for the CVP, deliveries to the SRSC have been reduced to 18% of their full contractual amount, which represents approximately 75% of their historic use.

Proposed section 876.1, subdivision (d)(8) of the emergency regulation allows for the maintenance of monthly demand projections for water rights and claims underlying the Sacramento River Settlement Contracts and Feather River Contracts notwithstanding the aforementioned reductions to contractual supplies associated with operational plans for the CVP and SWP. The reduced contractual supplies must be part of operations plans that are designed to conserve water upstream later in the year in order to protect cold water pools for salmon and steelhead, improve water quality, protect carryover storage, or ensure minimum health and safety water supplies. Section 876.1, subdivision (d)(8) finds that the diversion by junior right holders or claimants of any water projected to be unused by the SRSC or FRC is unreasonable under such circumstances as this water would not be available absent the reduced contractual supplies, and the water would need to remain instream to conserve cold water pools, improve water quality, protect carryover storage, or ensure minimum health and safety water supplies in accordance with the operations plan. The maintenance of SRSC and FRC demands based on historic diversions notwithstanding the reduction in contractual supplies could result in additional costs to water users who must curtail diversions due to the protection of the water unused by the SRSC and FRC. The fiscal effect on state and local government is the cost that would result from additional curtailments of rights held by state or local government entities due to the protection of this water.

Approach to Analysis of the Fiscal Effects of the Protection of Foregone Diversions by SRSC and FRC

This analysis conservatively assumes that additional curtailments resulting from the protection of foregone diversions by the SRSC or FRC would only be made under the regulation and would not occur without the emergency regulation. To determine the fiscal impact of protecting these foregone diversions, this analysis identifies the volume of water that would be made unavailable for diversion due to the maintenance of monthly demand projections for water rights and claims underlying the Sacramento River Settlement Contracts and Feather River Contracts notwithstanding the reduction in their contractual supplies.

To identify this volume of water, the water unavailability methodology used to determine water unavailability in the Delta watershed was run twice for each calendar month. The methodology was run once without modifying the demands for rights and claims underlying the SRSC and FRC (baseline scenario), and once with modified SRSC and FRC demands to match their respective reduction in contractual supplies (reduced

scenario). In the reduced scenario, demands for rights and claims underlying the SRSC and FRC were modified as follows.

April to September demands associated with water rights and claims underlying Feather River Contracts were adjusted to reflect the monthly volumes identified in DWR's 2022 Operations Outlook, submitted as required by Condition 5 of the Board's April 2022 Order Approving Temporary Urgency Changes to SWP and CVP water right requirements. April to September diversions identified in the Operations Outlook account for approximately 85 percent of contract diversions under the reduction. The remaining 15 percent was apportioned to water rights underlying the Feather River Contracts in accordance with the individual supplies and irrigation seasons identified in the contract deficiency provisions. These volumes were apportioned to the remaining months of each contract's allowable irrigation season by month (January to March and October to December) based on 2018 monthly diversion patterns.

Demands for water rights and claims underlying the Sacramento River Settlement Contracts were adjusted to reflect 2022 diversion schedules accounting for the 18 percent contractual supply when such schedules were available. In cases where a single contractor holds multiple water rights or claims, reduced contractual supplies were apportioned in order of water right priority, with demands assigned to the senior-most right or claim first. Demands for SRSC without identified diversion schedules were reduced to 25 percent of their 2018 demands, which is equal to approximately 18 percent of their full contract amount.

For the purposes of this analysis, the baseline and reduced scenarios considered observed water supplies from January to mid-June 2022, and daily full natural flow supply forecasts from the California Nevada River Forecast Center (CNRFC) for mid-June to December 2022. The median, 50% exceedance supply forecast was selected for months in which supply forecasts were used. The volume of water made unavailable due to the protection of foregone diversions by the SRSC or FRC can be classified as the difference in unmet demand between the baseline and reduced scenarios. This volume is approximately 748,000 AF.

To determine the fiscal impact to state and local government agencies, this volume was reduced to reflect the ability of impacted surface water diverters to rely on alternative sources of water such as groundwater pumping and short-term water transfers. The final net additional curtailment resulting from the protection of foregone diversions by the SRSC and FRC is the amount of water that water right holders or claimants, who would not have otherwise been curtailed, must cease diverting due to the unavailability of the foregone diversions. This volume is estimated to be approximately 262,000 AF to 467,000 AF, depending upon extent of replacement groundwater pumping (discussed below). To determine the effect on state and local government, eWRIMS was used to determine the percent of public water agencies (i.e., local government agencies) that

could be potentially affected by the additional curtailment. This percent is assumed to be evenly distributed amongst all water rights and claims. The fiscal effect on state and local government is comprised of the following elements:

1. A reduction in agricultural and municipal water agency revenues from lost water sales;
2. A corresponding reduction in state and local tax revenues;
3. Loss in state and local tax revenue associated with reduced agricultural production resulting from curtailed agricultural supply; and
4. Water replacement costs to agricultural and municipal water agencies.

The Delta watershed is comprised of the Sacramento River and San Joaquin River watersheds. However, the SRSC and FRC are in the Sacramento River watershed, and impacts to water availability in the San Joaquin River watershed resulting from the protection of these foregone diversions is negligible. Therefore, the fiscal effects of the protection of foregone diversions by the SRSC and FRC are limited to the Sacramento River watershed.

Estimates of the Distribution of Source Water for the Protection of Foregone Diversions by SRSC and FRC

In order to determine the fiscal impacts of the protection of foregone diversions by the SRSC and FRC, the fiscal analysis includes assumptions about the types of additional water use that are expected to be curtailed due to the protection of this water. The fiscal impacts of curtailments vary based on the type of use being curtailed, primarily between agricultural and urban uses. For the purpose of this analysis, agricultural water use is assumed to have one average value and domestic is assumed to have another.

To estimate the relative percentage of agricultural versus domestic and other use, and the relative percentage of state and local governments that may be affected, the analysis is based on eWRIMS data from the Delta watershed. Agricultural irrigation use represents approximately 87 percent of water diverted from the watershed, with domestic and other uses accounting for the remaining 13 percent. Of the water used for agriculture, 94 percent was provided by public agencies (e.g., irrigation districts) with the remaining 6 percent being provided by private entities. Of the water used for domestic and other uses, 93 percent was provided by public agencies (e.g., municipalities) with the remaining 7 percent being provided by private entities. Based on these percentages, the 748 TAF maximum curtailment in the Sacramento River watershed is assumed to be comprised of 612 TAF of agricultural water, 90 TAF of municipal water, and 46 TAF of various private diverters (see Table 11).

Table 11. Assumed Curtailments Required for the Protection of Foregone Diversions by SRSC and FRC (acre-feet)

	Sacramento River Watershed
Maximum Curtailment	747,915
Agricultural – public	611,645
Municipal – public	90,423
Private diversions	45,847

Changes in Quantity of Water Available for Sale by Public Agencies Due to the Protection of Foregone Diversions by the SRSC and FRC

Reductions in surface water available for diversion due to the protection of foregone diversions by the SRSC and FRC would likely be offset to some extent by increased groundwater pumping and water purchases (short-term leases). The net loss in water available for sale by public agencies is the amount of curtailed water they cannot replace in this fashion.

The reductions in water supply due to the protection of foregone diversions by the SRSC and FRC can be offset by replacement groundwater, and water transfers and leases. Tables 12 and 13 provide a summary of the net reductions, in AF, of water supply available for public agricultural and municipal water agencies once these offsets are applied. This does not include net reductions in supply for private diversions. The approach used to obtain the replacement rates for groundwater, water transfers, and leases is the same as those described in the Human Health and Safety Exception section of this report.

Table 12. Agricultural Agency and Irrigation Districts Net Curtailment Due to Protection of Foregone Diversions by SRSC and FRC (acre-feet)

	Sacramento River Watershed
Surface Water Supply Curtailment (Maximum) (AF)	612,000
Groundwater Replacement (Range of %)	20%–52%
Water Transfer and Leases	5%
Net Reduction (AF)	459,000–263,374

As shown in Table 12, the volume of groundwater replacement that may take place has a significant effect on the net reduction in overall water supply for agricultural producers. A similar circumstance is evident for municipal providers, as shown in Table 13.

Table 13. Municipal Water Provider Net Curtailment Due to Protection of Foregone Diversions by SRSC and FRC (acre-feet)

	Sacramento River Watershed
Surface Water Supply Curtailment (Maximum) (AF)	90,000
Conservation	20%
Groundwater Replacement (Range of %)	40%–50%
Water Transfer and Leases	10%
Net Reduction (AF)	27,000–18,000

Table 14 provides a summary of the net change in water available for public agencies due to the protection of foregone diversions by SRSC and FRC.

Table 14. Net Change in Water Available for Public Agencies Due to Protection of Foregone Diversions by SRSC and FRC (thousand acre-feet)

	Sacramento River Watershed	
	Low*	High*
Protected Foregone Diversions by SRSC and FRC	748	748
Agricultural Agency Net Reduction in Supply	-459	-263
Municipal Net Reduction in Supply	-27	-18
Net Change in Water Supply Available for Sale	262	467

* “Low” versus “high” extent of groundwater replacement for curtailed surface water (see Tables 12 and 13).

Fiscal Impacts to Public Water Supply Agencies Due to the Protection of Foregone Diversions by SRSC and FRC

Fiscal impacts to both public agricultural and municipal water agencies are assumed to result primarily from changes in water sale revenues and increased water replacement and conservation costs. These are calculated below by applying unit sales and cost values to the supply change estimates developed above.

Change in Public Water Agency Sale Revenues Due to Protection of Foregone Diversions by SRSC and FRC

Estimates of the price of water charged by public agricultural and municipal water supply agencies were developed based on an informal review of agency rates and previously developed public information. These prices are then applied to the net change in water available for sale as calculated and presented above in Table 14. This provides an estimate of the total associated change in revenue to these agencies. Table 15 presents the estimated change as ranges based on extent of groundwater replacement. The results indicate that there is a greater reduction in water sales revenues to agricultural and municipal agencies associated with lower groundwater replacement.

Table 15. Net Change in Public Agency Water Sales Revenues Due to Protection of Foregone Diversions by SRSC and FRC ($ million)

	Rate ($) per AF	Sacramento River Watershed	
		Low*	High*
Agricultural Agency	$50	-$23.0	-$13.2
Municipal	$850	-$23.0	-$15.3
Net Change in Revenues		-$45.9	-$28.5

* “Low” versus “high” extent of groundwater replacement for curtailed surface water (see Tables 12 and 13).

Increased Public Agency Water Supply Replacement and Conservation Costs Due to Protection of Foregone Diversions by SRSC and FRC

As described in the Human Health and Safety Exception section of this report, state and local agricultural and municipal agencies affected by curtailments pursuant to the proposed regulation are anticipated to pump groundwater and purchase additional supplies to replace a portion of their reduced surface water supplies. These agencies will also likely need to implement conservation and enforcement measures to address the shortages that remain after obtaining such replacement water. The costs of replacing curtailed surface water diversions with groundwater, the costs of leasing replacement surface water, and the costs associated with conservation and enforcement measures are the same as those described in the Human Health and Safety Exception section of this report.

Table 16. Net Change in Public Agency Water Supply Replacement and Conservation Costs Due to Protection of Foregone Diversions by SRSC and FRC ($ million)

	Rate ($) per AF	Sacramento River Watershed	
		Low*	High*
Agriculture			
Additional Groundwater Pumping	$95	$11.6	$30.2
Water Transfers	$750	$23.0	$23.0
Conservation and Enforcement	$30	$13.8	$7.9
Municipal			
Additional Groundwater Pumping	$95	$3.4	$4.3
Water Transfers	$750	$6.8	$6.8
Conservation and Enforcement	$165	$4.5	$3.0
Net Change in Costs		$63.0	$75.1

* “Low” versus “high” extent of groundwater replacement for curtailed surface water (see Tables 12 and 13).

Total Fiscal Impact to Public Water Supply Agencies due to the Protection of Foregone Diversions by SRSC and FRC

The total maximum fiscal impact to public agricultural and municipal water supply agencies (e.g., irrigation districts and municipalities) resulting from both decreased water sales and increased replacement and conservation costs are summarized in Table 17.

Table 17. Total Fiscal Impact on Public Water Supply Agencies Due to Protection of Foregone Diversions by SRSC and FRC ($ million)

	Sacramento River Watershed	
	Low*	High*
Municipal Water Providers	-$37.6	-$29.3
Agricultural Agencies	-$71.3	-$74.2
Net Change in Revenues	-$108.9	-$103.5

* “Low” versus “high” extent of groundwater replacement for curtailed surface water (see Tables 12 and 13).

Changes to State and Local Government Tax Revenues Due to the Protection of Foregone Diversions by SRSC and FRC

Changes to government tax revenues would be expected due to decreased public agency water sales and agricultural production sales (revenue) resulting from protection of foregone diversions by the SRSC and FRC under this emergency regulation.

Tax Revenue Impacts from Changed Public Agency Water Sales Due to Protection of Foregone Diversions by SRSC and FRC

Decreased overall water sales by public water agencies as described above will result in reduced associated government income tax revenues. An estimated tax rate was applied to the decreased public agency revenues to determine the corresponding impact on government income tax revenues. An average tax rate of $99 per $1,000 was estimated using an IMPLAN[7] model for the region. This is an estimate of the impact primarily on income taxes collected by state government and local governments; however, it does not include a breakdown of these two categories or consider indirect and induced economic effects.

Table 18 provides a summary of impacts on tax revenues from changes in sales by municipal water providers and agricultural agencies. Both municipal providers and agricultural agencies would experience decreased sales. Overall, the protection of foregone diversions by the SRSC and FRC would lead to a decrease in state and local tax revenues.

[7] Economic impact analysis software - IMPLAN (http://www.implan.com).

Table 18. Net Change in Tax Revenues due to Changes in Agency Sales Revenues Due to Protection of Foregone Diversions by SRSC and FRC ($ million)

	Tax rate	Sacramento River Watershed	
		Low*	High*
Change in Curtailed Municipal Provider Sales (Table 15)		-$23.0	-$15.3
Change in Agricultural Agency Sales (Table 15)		-$23.0	-$13.2
Applicable tax rate	10%		
Net Change in Tax Revenues		-$4.6	-$2.8

* “Low” versus “high” extent of groundwater replacement for curtailed surface water (see Tables 12 and 13).

Tax Revenue Impacts from Reduced Agricultural Production Due to Protection of Foregone Diversions by SRSC and FRC

Agricultural production sales revenue by growers could be negatively affected as irrigation surface water supplies are reduced by further curtailments than would occur without the protection of foregone diversions by the SRSC and FRC. Reduced agricultural production in turn would reduce associated income tax revenues. An analysis of the impact of curtailments on agricultural gross revenue was performed using the methodology provided in the Human Health and Safety Exception section of this report. Table 19 provides a summary of the impact (decrease) on state and local tax revenues in the Sacramento River watershed.

Table 19. Change in Tax Revenue as a Result of Reduced Agricultural Production Due to Protection of Foregone Diversions by SRSC and FRC ($ million)

	Sacramento River Watershed	
	Low*	High*
Change in Irrigation Supply (TAF)	459	263
Product Gross Revenue ($) per acre-foot	$1,200	$1,200
Change in Agricultural Production Sales ($ million)	-$550.8	-$316.0
Net Change in Tax Revenues @ 10% ($ million)	-$55.1	-$31.6

* “Low” versus “high” extent of groundwater replacement for curtailed surface water (see Tables 12 and 13).

Total Tax Revenue Impacts for State and Local Governments Due to Protection of Foregone Diversions by SRSC and FRC

The total impact on income tax revenues resulting from both decreased municipal agency water sales (Table 18) and reduced agricultural production (Table 19) are summarized in Table 20. This is an estimate of impacts mainly on income taxes collected by the state and local governments. This represents an upper bound tax revenue impact based on the curtailment estimates presented in this analysis, with actual impacts likely being less depending on actual curtailments. Also, fiscal support to local agencies from the State could in turn be affected, but such tax and funding relationships between the State and numerous local agencies are difficult to characterize and cannot be readily estimated. The proposed provision is not anticipated to result in costs or savings in federal funding to the State.

Table 20. Total Tax Revenue Impacts for State and Local Governments Due to Protection of Foregone Diversions by SRSC and FRC ($ million)

	Sacramento River Watershed	
	Low*	High*
Due to Changes in Municipal Agency Sales Revenues ($ million)	-$4.6	-$2.8
Due to Reduced Agricultural Product Sales ($ millions)	-$55.1	-$31.6
Net Change in Tax Revenues	-$59.7	-$34.5

* “Low” versus “high” extent of groundwater replacement for curtailed surface water (see Tables 12 and 13).

Summary of Fiscal Effect on State Government and Local Governments

The fiscal impacts presented in this report reflect the combined fiscal effect totals for all state and local governments. In this section, the impacts are separated into (1) those affecting state agencies and state government in aggregate and (2) those affecting local governments and district agencies. There is limited information about which agencies will be affected in what manner, so simplifying assumptions are made to determine impacts on the two categories of government. For this analysis, only the upper bound estimate of costs is provided, which represents the maximum cost to state and local governments. The “upper bound” is associated with the “low extent of groundwater replacement” columns in the tables above. Costs are included for the two reporting requirements and four categories affected by the human health and safety exception and protection of foregone diversions by the SRSC and FRC.

As noted above, there are approximately 45 state and 504 local and district/agency water rights in the two watersheds with total authorized face value or recent annual reported diversion amount of 1,000 AF or greater. State agencies therefore represent about 8 percent of these water rights and local agencies the remaining 92 percent. Applying these percentages to the certification reporting cost means that estimated state government costs are $8,580 and estimated local government costs are $98,670. For the monthly demand/diversion reporting cost, applying the same percentages means that estimated state costs are $891,600 and estimated local governments costs are approximately $10,253,100 (see Table 21).

Table 21. Distribution of Fiscal Impact of Reporting Requirements to State Government and Local Governments ($) *

	Total Costs (Upper Bound)	State Government Costs	Local Government Costs
Certification Form Completion and Review	$107,250	$8,580	$98,670
Twelve Months of Diversion/Demand Reporting	$11,144,700	$891,600	$10,253,100
Total	$11,251,950	$900,180	$10,351,770

*Unlike previous tables, Table 21 is not rounded to the nearest hundred thousand.

The estimated reduction in water sales revenues to agricultural and municipal water agencies is disaggregated into state and local government costs according to the same share of state versus local water rights. Water replacement and conservation enforcement costs are distributed to state and local governments by the same procedure. These changes in revenues and costs due to the human health and safety exception are shown in Table 22. The changes in costs due to the protection of foregone diversions by the SRSC and FRC are shown in Tables 23.

Government tax revenues are also affected by changes in water sales and by reductions in tax revenues associated with foregone agricultural product sales. To estimate the allocation of tax revenues, tax rates reported from the California Department of Tax and Fee Administration are used. California's sales tax rate is 7.25 percent; local taxing districts can apply an additional tax of 0.1 to 1.0 percent (CDTFA, 2021). For this analysis, a 0.5 percent local tax rate is assumed. As such, state tax revenues represent approximately 94 percent of all tax collected, and local districts receive the remaining 6 percent.[8] These shares of tax revenue are applied to tax revenue reductions due to (1) reduction in water sales and (2) reduction in agricultural product sales for the human health and safety exemption and protection of foregone diversions by the SRSC and FRC.

The human health and safety exception would result in upper bound costs that are summarized in Table 22. The fiscal costs for the human health and safety exception are comprised of the net change in public agency water sales revenues (Table 5), the change in associated tax revenues (Table 8), the net change in tax revenues due to

[8] State share of tax = 7.25% / (7.25 + 0.5), or 94 percent.

changes in agricultural production (Table 9), and the net change in costs for water supply replacement and water conservation (Table 6). Table 22 presents the distribution of these costs between state and local governments using the tax assumptions described above. Although the human health and safety exception will result in costs to agencies, the human health and safety exception provides a net savings to those agencies that use it. The savings is due to the ability of agencies receiving a human health and safety exception to continue to divert water, and to receive revenues associated with the water sales. Stated another way, the human health and safety exception allows more water to be sold by participating agencies than they would otherwise sell, absent the exception. It is assumed that all agencies seeking the exception would be local districts, and that none are state agencies, so the savings would accrue entirely to local government. State and local tax revenues associated with these water sales are distributed using the tax assumptions listed above. As shown in Table 22, the savings to state government is up to $17.8 million, and the savings to local government is up to $190.7 million.

The bottom of Table 22 shows that the cost to state government exceeds the savings by $4.2 million; that is, the fiscal impact to state government from the human health and safety exception in the regulation is a cost of $4.2 million.

Table 22. Distribution of Fiscal Impact of Human Health and Safety Exception to State Government and Local Governments ($ millions)

Category of Impact	Net Change in Revenue and Costs (Upper Bound)	State Government	Local Government
Costs			
Changes in sales revenues for agricultural and municipal agencies	$16.3 (Table 5)[9]	$1.3	$15.0
Change in Tax Revenues due to Changes in Agricultural and Municipal Agency Sales Revenues	$1.6 (Table 8)[10]	$1.5	<$0.1
Tax revenue reduction due to change in agricultural production	$18.6 (Table 9)[11]	$17.5	$1.1
Replacement water cost & conservation / enforcement	$20.6 (Table 6)[12]	$1.6	$18.9
TOTAL COSTS	$57.1	$22.0	$35.1
Savings			
Increased agency water sales attributed to human health and safety exception	$189.6 (Table 5)[13]	$0	$189.6
State & local tax revenues due to increased agency water sales	$19.0 (Table 8)[14]	$17.8	$1.1
TOTAL SAVINGS	$208.5	$17.8	$190.7
NET COSTS (Costs minus Savings)	-$151.4	$4.2	-$155.6

[9] Value derived from summing four numbers in Table 5: agricultural and municipal agency sales, low groundwater replacement column, for Sacramento and San Joaquin River watersheds.
[10] Value derived from summing four numbers in Table 8: change in curtailed municipal provider sales, change in agricultural provider sales, low groundwater replacement column, for Sacramento and San Joaquin River watersheds. This sum is then multiplied by the tax rate in Table 8 (10%).
[11] Value derived from summing two numbers in Table 9: net change in tax revenue, low groundwater replacement column, for Sacramento and San Joaquin River watersheds.
[12] Value derived from summing two numbers in Table 6: net change in costs, low groundwater replacement column, for Sacramento and San Joaquin River watersheds.
[13] Value derived from summing two numbers in Table 5: Increased Municipal Agency Water Sales, low groundwater replacement column, for Sacramento and San Joaquin River watersheds.
[14] Value derived from summing two numbers in Table 8: Change Due to Increased Municipal Agency Water Sales, low groundwater replacement column, for Sacramento and San Joaquin River watersheds. This sum is then multiplied by the tax rate in Table 8 (10%).

The proposed emergency regulation provision addressing the protection of foregone diversions by the SRSC and FRC would result in upper bound costs that are summarized in Table 23. The fiscal costs for the protection of foregone diversions by the SRSC and FRC are comprised of the net change in public agency water sales revenues (Table 15), the change in associated tax revenues (Table 18), the net change in tax revenues due to changes in agricultural production (Table 19), and the net change in costs for water supply replacement and water conservation (Table 16). Table 23 presents the distribution of these costs between state and local governments using the tax assumptions described above.

Table 23. Distribution of Fiscal Impact of Protection of Foregone Diversions by SRSC and FRC to State Government and Local Governments

Category of Impact	Net Change in Revenue and Costs (Upper Bound Cost)	State Government Costs	Local Government Costs
Changes in sales revenues for agricultural and municipal agencies	$45.9 (Table 15)	$3.7	$42.2
Tax revenue reduction due to change in water sales	$4.6 (Table 18)	$4.3	$0.3
Tax revenue reduction due to change in agricultural production	$55.1 (Table 19)	$51.8	$3.3
Replacement water cost & conservation / enforcement	$63.0 (Table 16)	$5.0	$57.9
TOTAL COSTS	$168.5	$64.8	$103.7

Table 24 presents an overall summary of the upper bound fiscal impact to state and local government of the regulation, including reporting costs, the human health and safety exception, and the protection of foregone diversions by the SRSC and FRC. Table 24 also includes the cost savings that are attributable to the human health and safety exception. The information in this table is derived from Tables 21 through 23 above. In summary, there is a maximum estimated fiscal cost of $28.4 million for the proposed regulation. This cost is comprised of a net fiscal cost of $69.9 million to state government and a net fiscal cost savings of $41.5 million to local governments.

Table 24. Summary of Fiscal Impact on State Government and Local Governments

Category of Impact	Total Cost or Savings (Upper Bound)	State Government	Local Government
Costs			
Reporting Requirements	$11.3	$0.9	$10.4
Human Health and Safety Exception	$57.1	$22.0	$35.1
Protection of Diversions Foregone by SRSC and FRC	$168.5	$64.8	$103.7
TOTAL COSTS	$236.9	$87.7	$149.2
Savings			
Human Health and Safety Exception	$208.5	$17.8	$190.7
TOTAL SAVINGS	$208.5	$17.8	$190.7
NET COSTS (Costs Minus Savings)	$28.4	$69.9	-$41.5

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