

REGIONAL WATER QUALITY CONTROL BOARD, CENTRAL VALLEY REGION

Amendments To the Water Quality Control Plans for the Sacramento River and San Joaquin River Basins and Tulare Lake Basin

To Incorporate a Central Valley-wide Salt and Nitrate Control Program

Final Staff Report

May 2018



CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

State of California
Edmund G. Brown, Governor

California Environmental Protection Agency
Matthew Rodriquez, Secretary

REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

Karl Longley, Chair
Denise Kadara, Vice Chair
Jon Costantino, Member
Robert Schneider, Member
Raji Brar, Member
Carmen Ramirez, Member
Dr. Daniel Marcum, Member

Pamela C. Creedon, Executive Officer
Patrick E. Pulupa, Incoming Executive Officer

11020 Sun Center Drive #200
Rancho Cordova, CA 95670

Phone: (916) 464-3291
email: info5@waterboards.ca.gov
Web site: http://www.waterboards.ca.gov/centralvalley/

DISCLAIMER

This publication is a report by staff of the California Regional Water Quality Control Board, Central Valley Region. This report contains the evaluation of alternatives and technical support for the adoption of amendments to the Water Quality Control Plan for the Sacramento and San Joaquin River Basin and for the Water Quality Control Plan for the Tulare Lake basin (Resolution No. R5-2018-0034). Mention of specific products does not represent endorsement of those products by the Central Valley Water Board.

Amendment
To the
Water Quality Control Plans for the Sacramento River and San Joaquin River Basins and Tulare Lake Basin

To
Incorporate a Central Valley-wide Salt and Nitrate Control Program

Final Staff Report

May 2018

REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

ACKNOWLEDGEMENTS:

Thank you to the participants of the Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) initiative who have spent countless hours providing their insight and expertise to craft a management strategy for the future of California. Their commitment to the overall goals of the effort, perseverance through contentious debates and development of innovative solutions have been invaluable to evolution of the proposed salt and nitrate control program and supporting policies.

Disclosures:

The foundation of the proposed amendments, including technical studies, environmental and economic analyses, and case studies were developed as part of the CV-SALTS Salt and Nitrate Management Plan submitted to the Central Valley Water Board in January 2017. Funding for the effort included a combination of Clean-up and Abatement Account funding from the State Water Resources Control Board ($5-million: Project CAA 284) and stakeholder financial and in-kind support (over $17-million as of the February 2016 State Water Board annual report).

EXECUTIVE SUMMARY

This Staff Report provides the justification and supporting documentation for proposed amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins and the Water Quality Control Plan for the Tulare Lake Basin (collectively referred to as Basin Plans) to establish a Central Valley-wide Salt and Nitrate Control Program. The foundation for the proposed amendments is the Central Valley-wide Salt and Nitrate Management Plan (SNMP). The SNMP was developed through the Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) initiative and submitted to the Central Valley Water Board in January 2017. The SNMP provides an overarching framework for managing salt and nitrate in the Central Valley and identified 11 proposed strategies, policies, policy changes or clarifications to the Basin Plans to facilitate the implementation of the proposed strategies and policies contained in the SNMP. The SNMP was developed to achieve the following management goals:

- Sustain the Valley's lifestyle
- Support regional economic growth
- Retain a world-class agricultural economy
- Maintain a reliable, high-quality water supply
- Protect and enhance the environment

The Central Valley Water Board adopted Resolution R5-2017-0031 at its March 9, 2017, meeting acknowledging receipt of the SNMP and directed staff to initiate basin planning actions to develop amendments to implement strategies, policies, guidance and revisions to the existing policies to address the salt and nitrate water quality concerns in the Central Valley. These proposed amendments establish a Salt and Nitrate Control Program, and provide specific recommendations for the control and permitting of salt discharges to surface and groundwater and of nitrate discharges to groundwater. They propose new policies, new regulatory tools (or strategies), and recommended clarification to existing policies to facilitate the Central Valley Water Board's efforts to achieve the salt and nitrate management goals. Staff has continued working through the CV-SALTS initiative to refine the original SNMP recommendations and to develop the current proposed recommendations outlined in this staff report.

ISSUE

The Central Valley Water Board's jurisdictional area encompasses nearly 60,000 square miles of area, or approximately 40% of the land area of California. California's Central Valley is home to over 7.8 million or just over 20% of California's population (U.S. Census 2016). The Central Valley is targeted to be the fastest growing region in California, with the predominant growth occurring within 18 counties that encompass the valley floor area (approximately 18,000 square miles of land). According to the California Department of Finance (DOF) Central Valley is projected to grow nearly 6%, 17% and 49% by 2021, 2030 and 2060 respectively. Two major river systems drain and define the northern area of the Central Valley – the Sacramento and San Joaquin Rivers and their tributaries. The south area of the valley is the Tulare Lake Basin. The Tulare Lake Basin is essentially a closed basin, except in extreme storm events.

The Central Valley is home to a significant number of industrial and domestic activities that may impact surface and groundwater quality. It is one of the most productive agricultural regions in the world and is home to over 80 percent of the agricultural lands in California or 7 million acres.

On less than 1 percent of the total farmland in the United States, the Central Valley produces 8 percent of the nation's agricultural output (United States Geological Survey, 2017).

Portions of California's immense Central Valley have salt or nitrate accumulations in the groundwater and soil from both historical and ongoing discharges from legal and accepted agriculture, municipal, and industrial activities. The high nitrate concentrations are impacting drinking water quality and, in some communities, water supply and/or domestic wells do not meet safe drinking water standards. The salt accumulations have resulted in 250,000 acres taken out of production and about 1.5 million acres being salinity impaired. If not addressed, the economic impacts could be staggering. For example, if salt accumulations are not managed, the resulting direct economic costs to the Valley could exceed $1.5-billion per year by 2030. The Valley's economic future depends on addressing these impacts.

In 2006, the Central Valley Water Board initiated a collaborative stakeholder initiative, known as Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS), to develop a Central Valley- wide Salt and Nitrate Management Plan (SNMP). CV-SALTS was tasked with ensuring the SNMP complied with the requirements set forth in the State Water Resources Control Board (State Water Board) Recycled Water Policy. Stakeholder membership included representatives from the Regional and State Water Boards, agriculture, municipalities, industry, water supply, environmental justice, state and federal regulatory agencies and the public. CV-SALTS initiative developed the SNMP that provides a comprehensive regulatory and programmatic approach for the sustainable management of salts and nitrate in groundwater and surface water.

This staff report provides the rationale and supporting documentation for proposed amendments utilizing, in part, technical work completed under the CV-SALTS initiative. The Salt and Nitrate Control Program proposed by these amendments is designed to address both salt and nitrate concerns in surface and groundwaters; however, the primary focus of early actions (first ten years) for nitrate is on groundwater quality and impacts to drinking water supplies, and for salt to conduct a study to develop a long-term strategy to control and manage salt in the valley.

ENVIRONMENTAL SETTING

The Salt Control Program applies to discharges to surface and groundwater within the Central Valley Region while the Nitrate Control Program applies to discharges to groundwater. Four distinct hydrologic regions comprise the Central Valley Region with the highly modified hydrology of each influencing the movement and deposition of salt throughout the Valley (Figure ES-1). The Sacramento River Hydrologic Region is approximately 27,200 square miles and covers the majority of northern California (California Department of Water Resources, 2013a) from its source waters in the Cascade Range to Sacramento-San Joaquin Delta. San Joaquin River Hydrologic Region is approximately 15,200 square miles. It begins in the high Sierra Nevada and historically flowed north flowing where it joined the Sacramento River to form the Delta. The Central Valley project diverted the northern reach of the San Joaquin River south into the Tulare Lake Basin. The last 60-miles of the river flows to the Delta. Tulare Lake Hydrologic Region is approximately 17,000 square miles and is located to the south of the San Joaquin River Hydrologic Region. Surface water from the Tulare Lake Hydrologic Region only drains north into the San Joaquin River in years of extreme rainfall. Delta Region is the combined flows of the Sacramento and San Joaquin River basins flow.

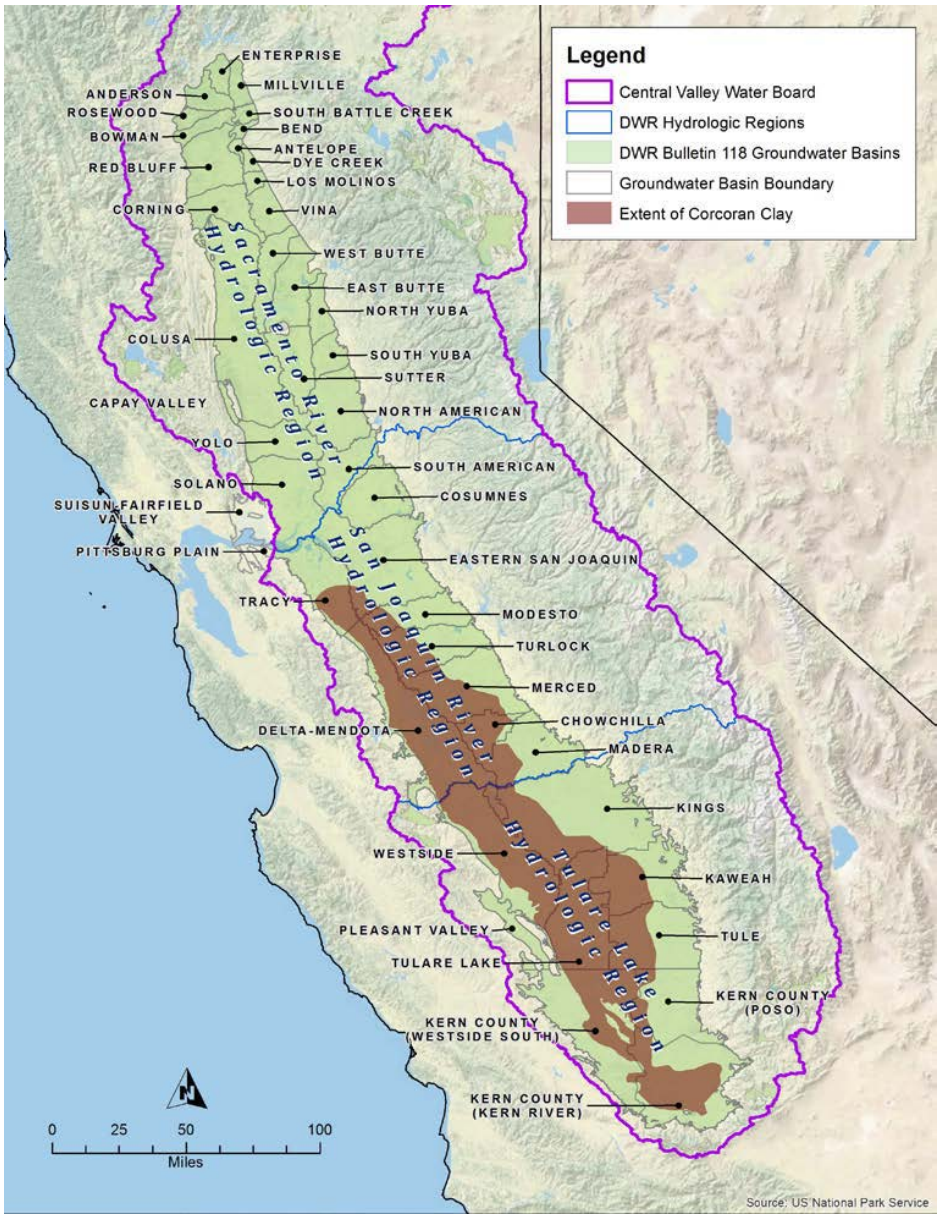
Figure ES - 1. Central Valley Hydrologic Regions and Surrounding Geography



Groundwater Basins/Sub-basins

The California Department of Water Resources has defined the groundwater basins/sub-basins for the Central Valley 5 Region both within and outside the Central Valley Floor (California Department of Water Resources, 2003). Within the Central Valley Region, there are 86 groundwater basins and 126 groundwater sub-basins, as defined by DWR Bulletin 118 (California Department of Water Resources 2003) (Figure ES-2). Groundwater basins/sub-basins in the Central Valley Region encompass about 24,100 square miles; in the valley floor, these basins/sub-basins comprise about 20,500 square miles, or about 85% of the total groundwater basins/sub-basins within Region 5 (California Department of Water Resources, 2003).

Figure ES - 2. DWR Bulletin 118 Groundwater Basin and Extent of the Corcoran Clay in the Central Valley Floor



BENEFICIAL USES AND WATER QUALITY OBJECTIVES

The Basin Plans and the San Francisco Bay/Sacramento-San Joaquin Delta Estuary Water Quality Control Plan (Delta Plan) establish beneficial uses for many surface waters and groundwaters in the Central Valley. Studies conducted under CV-SALTS determined that the beneficial uses most broadly impacted by salt and nitrate within the Central Valley were municipal and domestic supply (MUN) and Agricultural Supply (AGR) which encompasses crop irrigation and stock watering. The Basin Plans presumptively assigned the MUN and AGR beneficial use to all water bodies, except where it has been specifically exempted through the Basin Plan.

MUN Water Quality Objectives

The Basin Plans incorporate primary and secondary Maximum Contaminant Levels (MCLs) Tables from Title 22 of the California Code of Regulations ("Title 22") as water quality objectives to protect the MUN beneficial use[1].

For nitrates, the SNMP and this amendment affirms the use of the primary MCL for nitrate as 10 mg/L (nitrate as nitrogen or NO_3-N) as the water quality objective.

For salts, the SNMP and this amendment clarifies that the Board will continue to use the secondary MCLs for salinity as a range for total dissolved solids (TDS) or electrical conductivity (EC) concentrations as established in Table 64449-B of Title 22.

AGR Water Quality Objectives

For nitrate, no numeric water quality objective has been established for nitrate to protect the AGR beneficial use; these Basin Plan Amendments do not change this finding.

For salts, numeric water quality objectives have been established to protect AGR for certain water bodies in the Central Valley. For all other water bodies, no numeric water quality objective has been established for salt to protect the AGR beneficial use. These Basin Plan Amendments do not change these objectives.

SALT AND NITRATE CONDITIONS IN THE CENTRAL VALLEY REGION

Salt and nitrate management requires an understanding of water movement on and beneath the land surface. The direction of surface water and groundwater flow and associated volumes of those flows dictate the movement of salt and nitrate in the subsurface, which has implications for management of these constituents at the surface. To support development of the SNMP and these amendments, CV-SALTS completed assessments of salt and nitrate conditions in Central Valley waters (Table 2-2). In addition to water quality assessments, the CV-SALTS initiative conducted other studies that informed the development of the SNMP strategy and recommendations to address salts and nitrates in the Central Valley (Table 4-1).

Surface Water Quality

Nitrate and salt conditions were assessed for major surface water bodies and tributaries within the Central Valley using existing data available through the California Environmental Data Exchange Network (CEDEN) and USGS Water Quality Portal (WQP). Available water quality

[1] SRSJR Basin Plan, Pg. III-10.0 and TLB Basin Plan, Pg. III-7.

data from 1990 to present were analyzed. Data was analyzed for the hydrologic regions of the Sacramento and San Joaquin Rivers, Tulare Lake and Delta.

Detailed findings of surface water quality are provided in Appendix A, and summarized below.

Nitrate water quality was very good for all the hydrologic regions evaluated. Nitrate concentrations were well below the primary MCL of 10 mg/L (NO_3-N).

Salinity water quality varied based on the hydrologic region. Thirty-three (33) water bodies within the hydrologic regions are listed as impaired for salinity with the greatest number of listings (26) within the San Joaquin River region.

Sacramento River Region - Water Quality is good in this region with relatively few salt impaired areas. However, salt is exported from this region to the Delta and ultimately the San Joaquin and Tulare Lake regions via the water projects.

San Joaquin River Region – Water quality varies by the area within the drainage region. The eastside tributaries have good salinity water quality. The westside tributaries have extensive water quality impairment due to salinity. The main stem water quality varies depending on the water year type and the quality of flows from its tributaries

Tulare Lake Region - Salinity concentrations are elevated in many water bodies but none have been identified as impaired (Provost & Pritchard Consulting Group, 2014).

Delta Region - Several Delta waterways have been listed as exceeding salinity concentrations to protect agricultural supply with some areas also noted as exceeding secondary MCLs.

Groundwater Quality

The Central Valley's major groundwater basins are located on the valley floor. The main source of groundwater in these basins is typically located within the upper 1,000 feet of the subsurface deposits, and was the main focus of the SNMP strategies.

Water quality for salt and nitrate in groundwater water was assessed for: ambient conditions, predicted trends out to 50 years, and potentially available assimilative capacity. The assessment focused on describing salt and nitrate conditions in the "upper," "lower," and "production" zones within each groundwater basin/sub-basin (Figures 2-4 and 2-5).

CV-SALTS developed a database of water quality data from numerous sources that was used to support the various water quality analyses completed to describe salt and nitrate conditions in Central Valley Region. A one square mile grid of the valley floor was used as a base to conduct spatial and aggregate analyses of groundwater quality data.

Aggregate findings by groundwater basin/sub-basin are provided in Appendix B.

Salinity in Groundwater

Salinity water quality data in the production zone was evaluated against threshold concentrations of total dissolved solids (TDS) to determine if a basin was impacted by salts. For AGR, TDS values below 450 mg/L are not anticipated to impact irrigated agriculture while concentrations above 2,000 mg/l are anticipated to have a severe impact (Ayers & Westcot, 1985). For MUN supply, TDS concentrations at or below 500 mg/L are recommended with an upper range of 1,000 mg/L and a short-term range up to 1,500 mg/L to protect human welfare

and provide for consumer acceptance (Title 22 of the California Code of Regulations). Using these thresholds, the SNMP found broad areas along the western side of the valley floor of the San Joaquin River and Tulare Lake Basins and more limited areas within the Sacramento River Basin to have groundwater production zone concentrations exceeding 500 mg/L TDS. The SNMP also found the areas of concern to be broadly dispersed (Figure 2-7).

Nitrate in Groundwater

Nitrate water quality data in the upper zone was evaluated against primary MCL of 10 mg/L nitrate (NO_3-N) to determine if a basin was impacted by nitrates. The SNMP found elevated levels of nitrate to occur toward the eastside and central portions of the valley floor in the San Joaquin and Tulare Basins rather than along the west side. Like salinity, the areas of concern are broadly dispersed (Figure 2-8).

Impacts of Excessive Salt and Nitrates in Groundwater

CV-SALTS evaluated the nature and extent of the nitrate and salinity conditions in the Central Valley and evaluated alternative solutions to address or mitigate the impacts of salt and nitrate.

Salt is conservative. Limited options are available to reduce ambient concentrations once groundwater concentrations are elevated. The CV-SALTS initiative conducted three studies under the Strategic Salt Accumulation and Land Transport Study (CDM Smith, 2013) (CDM Smith, 2014) (CDM Smith, 2016b) to evaluate the extent of the salt issue and evaluate alternative solutions. The conclusions of the studies noted, in part, that maximizing current salt management practices would only address approximately 15% of the salt load with roughly 85% of the accumulating salt remaining unmanaged and continuing to impact beneficial uses of Central Valley groundwaters (Figure 2-10).

The Nitrate Implementation Measures Study (NIMS) conducted by CV-SALTs evaluated means of reducing current ambient nitrate groundwater concentrations to protect and restore beneficial uses. A pilot study test was conducted within a 200- square mile are of an irrigation district within the Tulare Lake Basin that contained groundwater nitrate concentrations exceeding drinking water standards and impacting municipal and domestic supplies (CDM Smith, 2016a).

Using the NIMS findings, an Aggressive Restoration Study was initiated. The study evaluated an 18-square mile area within the same 200-square mile pilot area of the Tulare Lake Basin evaluated in the NIMS. The Aggressive Restoration Study evaluated four (4) alternative scenarios to determine the time and costs required to restore groundwater quality to nitrate levels at or below the primary MCL of 10 mg/L (NO_3-N) (Tables 2-14 and 2-15). The Aggressive Restoration Study found, in part, that a targeted restoration works better in smaller geographic settings and restoration is not likely feasible on the scale of the Central Valley (Luhdorff & Scalmanini and Larry Walker Associates, 2016b).

Proof of Concept

Some of the proposed amendments in this staff report rely on appropriate designation of beneficial uses and level of protection as well as alternative approaches to regulating salt during extended dry periods. Three separate Basin Plan Amendments that are under various levels of approval, were developed under the CV-SALTS initiative as proof of concepts and

serve as models for future basin planning amendment activities to further implement the Salt and Nitrate Control Program.

- Resolution R5-2017-0032 (In effect)*:* Basin Plan Amendment to dedesignate MUN and AGR from a horizontally and vertically delineated portion of the Tulare Lake Bed groundwater basin. This serves as a template to delineate areas that may serve as salt management zones so that salt may be moved out of salt sensitive areas and consolidated*.*

- Resolution R5-2017-0088 (scheduled for State Water Board approval hearing in 2018): Basin Plan Amendment to incorporate a MUN evaluation process for agriculturally dominated water bodies. This allows reuse of limited water supplies without the constraints of requiring dischargers to meet drinking water maximum contaminant levels in constructed ag drains and other facilities with no existing or potential MUN use

- Resolution R5-2017-0062 (approved by State Water Board January 2018 (R5-2018-0002); scheduled for submittal to OAL and USEPA Spring 2018): Basin Plan Amendment to establish salinity objectives in the Lower San Joaquin River upstream of Vernalis. This provides example of process to determine appropriate level of AGR protection as well as considerations for extended dry year and/or conservation policies.

SALT AND NITRATE CONTROL PROGRAM

The amendments in this staff report propose a Salt and Nitrate Control Program intended to facilitate the salt and nitrate implementation strategies recommended in the SNMP. They are designed to address both legacy and ongoing salt and nitrate accumulation issues in surface and groundwater. The over-arching management goals and priorities of the control are:

1. Ensure Safe Drinking Water Supply (short and long term)
2. Achieve Balanced Salt and Nitrate Loading
3. Implement Long-Term, Managed Restoration of Impaired Water Bodies

The Salt and Nitrate Control Program is phased (Figure ES-3) with the primary focus of early actions on nitrate impacts to groundwater drinking water supplies, and establishes specific implementation activities (Table ES-1).

Figure ES - 3. Salt and Nitrate Management Strategy

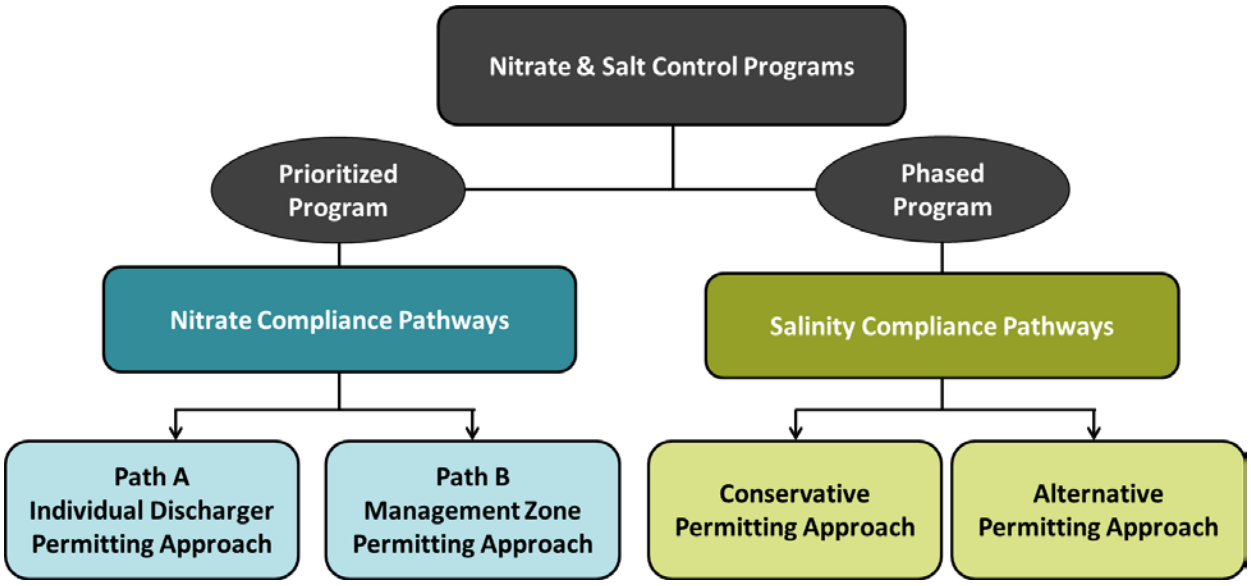


Table ES - 1. Description of Major Components of the Proposed Salt and Nitrate Control Program

Component	Description
Salt Control Program	The Salt Control Program recommends a process for moving forward with a three-phased long-term salinity management program. Each phase is anticipated to have a duration of 10-15 years. • Phase I: Salinity Prioritization and Optimization Study (P&O Study) to convert current conceptual management projects into feasibility studies • Phase II: Project Development and Acquisition of Funds • Phase III: Project Implementation/Construction of Physical Project (e.g. salt management areas; treatment facilities; regulated brine line) Phase I includes adoption of a proposed Interim Salinity Permitting Approach for permittees who discharge salt whereby they may select to be regulated under conservative, source control limits or opt into participating in the funding and development of the P&O Study. A third party entity made up of a coalition of regulated dischargers and other entities will manage and fund the P&O Study. Timelines and milestones are identified.
Prioritized Groundwater Basins for Nitrate Control Program Implementation	Scores were assigned to one square mile grids based on the ambient nitrate as nitrogen concentration in the Upper Zone, for each basin identified in the Central Valley Hydrologic Unit Model (Faunt, 2009)). Based on the aggregate score within the basin boundaries, the basins were prioritized for implementation of the Nitrate Control Program. Permitted dischargers to groundwater within Priority 1 basins will be notified within one year of the effective date of the amendments of their need to comply with the Nitrate Control Program. Permittees in Priority 2 basins will receive notification within two to four years of the effective date. The remaining basins will be prioritized at the discretion of the Central Valley Water Board. The Central Valley Water Board will review the priorities no later than 1 January 2024 after considering water quality-based factors and other relevant information. Nothing in the program prevents interested parties from providing additional information and requesting a review of an area's priority.

Table ES - 1. Description of Major Components of the Proposed Salt and Nitrate Control Program

Component	Description
Groundwater Management Zone Strategy (Nitrate Specific)	The Nitrate Control Program recommends that the Basin Plans be amended to allow and encourage management of nitrate through the establishment of management zones. In general, a management zone would consist of multiple permittees and other local stakeholders working collectively to first ensure safe drinking water, then to manage nitrates to create a balance within the defined management area (where reasonable and feasible), and ultimately to develop and implement a long-term plan for restoration of groundwater (where reasonable, feasible and practicable) to meet applicable water quality objectives. Although the Basin Plans do not currently prevent the management of nitrates through the creation of management zones, the Program defines the characteristics, intent and purpose of a Management Zone as well required components for consideration of approval by the Central Valley Water Board.
Nitrate Control Program	The Nitrate Control Program provides two pathways for compliance for permitted discharges to groundwater. Pathway A is for individual permittees and sets conservative limitations for source control. Requirements are based on categories that take into account nitrate concentrations in the discharge as well as in the Shallow Zone of the aquifer. Pathway B is for permittees proposing to be regulated under a Management Zone. Both Pathways have their own specific milestones and timelines. However, both Pathways require the development of an Early Action Plan (EAP) to identify means of providing short term safe drinking water supplies to users impacted by nitrate concentrations in their groundwater source which falls within the permittee's zone of contribution. When needed, both Pathways also require development of an alternate compliance project to allow continued discharge into a threatened or impaired groundwater basin while the permittee develops a long-term solution to ensure safe drinking water and move toward balanced loading and restoration. The Control Program includes guidance on the minimum requirements for an alternative compliance project which relies in part on the Conditional Exceptions Policy (discussed below).
Conditional Prohibition	A Conditional Prohibition will apply to all permittees discharging salt and nitrate, except permittees regulated under the Board's Irrigated Lands Regulatory Program (ILRP) and potentially other General Orders, from the time the permittee receives a Notice to Comply until such time that the permittees' existing waste discharge requirements are updated or amended through a public hearing to reflect requirements of the Salt and Nitrate Control Program, including incorporation of any proposed Alternate Compliance Project or Management Zone Implementation Plan. The Central Valley Water Board will consider updating ILRP General Orders within 18 months of the effective date of the amendments. Conditions will include meeting Control Program requirements including meeting timelines for response to Notices to Comply, selection of permitting pathway, submittal of justification for pathway selection, implementation of Early Action Plans when needed, and submittal of any needed Alternate Compliance Project or Management Zone Proposal and associated Implementation Plan.
Surveillance and Monitoring	The goals of the Salt and Nitrate Monitoring Program are to: assess the effectiveness of the Control Program; develop statistically-representative ambient water quality determinations and trends; and maximize the use of existing monitoring programs. Information gathered will be consolidated and evaluated by the entity leading the monitoring study. Within two years of the effective date of the Salt and Nitrate Control Program, the lead entity will submit a Work Plan and a Quality Assurance Project Plan for Central Valley Water Board approval. Permittees with salt or nitrate discharges must either gather needed information required by the plan for their area of contribution and provide the information to the lead entity in a readily available format or must demonstrate their support for the lead entity to gather needed information by submitting documentation of such support from the lead entity. An assessment of ambient water quality and trends and a review of the overall progress of the Salt and Nitrate Control Program based on water quality trends will be completed at least once every 5-years or other time schedule is approved by the Central Valley Water Board.

Table ES - 1. Description of Major Components of the Proposed Salt and Nitrate Control Program

Component	Description
Variance Policy	The existing conditional Salinity Variance Program applies to salinity water quality standards for the following constituents: electrical conductivity, total dissolved solids, chloride, sulfate and sodium, and was developed to allow dischargers to continue to meet performance based standard while supporting the CV-SALTS initiative. The current Salinity Variance Program prohibits the Central Valley Water Board from approving any salinity variance after June 30, 2019, because it was intended that any extension, or permanent, long-term Salinity Variance Program should be developed through the CV-SALTS process and that stakeholders needed to make appropriate recommendations for such a policy in the SNMP. The Salt and Nitrate Control Program recommends that the Salinity Variance Program be extended for an additional 15 years to allow permittees to participate in the P&O Study. Permittees who do not participate in the P&O Study are not eligible for a salinity variance.
Exceptions Policy	The existing Salinity Exceptions Policy that only applies to TDS/EC, chloride, sulfate and sodium, prohibits the Central Valley Water Board from authorizing new exceptions or reauthorizing previously approved exceptions after June 30, 2019. This Salt and Nitrate Control Program recommends revising the existing Exceptions Policy by amending the Basin Plans to (a) add nitrate to the list of chemical constituents for which the Central Valley Water Board may authorize an exception; (b) expand/revise conditions or authorization of an exception to reflect the requirements of the Salt and Nitrate Control Program (no separate application for an exception is needed if meeting Phase I Alternative Salinity Compliance requirements and implementation of an approved alternate nitrate compliance project, respectively); (c) remove the existing sunset provision that prohibits the granting of exceptions beyond June 30, 2019; and (d) delete the current provision limiting the term of an exception to no more than 10 years and add a new provision stating that when authorizing an exception, the Central Valley Water Board shall generally not exceed a term of 10-years but may only exceed 50-years if management practices under the exception are resulting in significant and measurable improvements in water quality. Exception application provisions specific to boron are also included.
Drought and Water Conservation Policy	The effects of drought and the implementation of encouraged or mandated water conservation practices can significantly impact effluent quality in discharges to surface water or groundwater and compliance issues for some permittees because of increased TDS/EC and other salinity-related constituents in influent and effluent. Historically, WDRs/Conditional Waivers rarely have included any special provision or consideration for variations in effluent quality, directly or indirectly related to recurrent drought conditions that are beyond the control of the permittee or for ongoing, expanding and sometimes mandated conservation practices. The Salt and Nitrate Control Program proposes interim salinity effluent limits during periods of drought or increased implementation of water conservation practices. During periods of drought the interim effluent limit for electrical conductivity (EC) is not to exceed 2,200 uS/cm as a 30-day running average. The limits may be established in terms of concentration or total dissolved solids (TDS) loading. Interim limits for conservation efforts shall be based on either not exceeding the receiving water concentration and not causing down gradient impacts or maintaining TDS loading consistent with historical load (with consideration given to reasonable increment of use or change in source water salinity concentration while not exceeding the numeric limitations noted above. The Drought and Conservation Policy is proposed to guide interim effluent limits as needed under the Variance Policy during Phase 1 of the Salt Control Program and may become generally applicable during future phases based upon review of the overall program.

Table ES - 1. Description of Major Components of the Proposed Salt and Nitrate Control Program

Component	Description
Offsets Policy	An offset is an alternative means of achieving compliance with a WDR, either alone or in combination with other actions, for a given pollutant or pollutants. An offset allows for the management of other sources and loads (not directly associated with the regulated discharge) so that the combined net effect on receiving water quality from the discharge and the offset is functionally-equivalent to or better than that which would have occurred by requiring the permittee to comply with its WDR at the point-of-discharge. The Salt and Nitrate Control Program includes an Offsets Policy, which recommends that the Basin Plans be amended to provide authority for the Central Valley Water Board to allow the use of offset projects to comply with WDRs, but only for groundwater. In general, offsets are to be utilized in the same groundwater basin/sub-basin where the discharge occurs, however, offsets may also be used to incentivize implementation of some large-scale projects such as a regional regulated brine line. Offsets may be proposed to support a request for either an allocation of available assimilative capacity or an exception but cannot result in unmitigated localized impairments. Offsets must be (1) proposed by permittee (individual or group of permittees) as an Alternative Compliance Project (ACP, see below); (2) approved by the Central Valley Water Board; and (3) enforceable through a WDR or other orders issued by the Board. The approved offset must specify the time period for which it applies, a monitoring and reporting program, and remedial actions that must be undertaken by the permittee if the offset project fails.
Clarified Water Quality Objectives and Guidance to Implement Secondary Maximum Contaminant Levels	The Salt and Nitrate Control Program proposes to incorporate guidance into the Basin Plans to support to clarify implementation of SMCLs (from Title 22) in permits for discharge to surface water and groundwater. These recommendations include: ▪ Under Chapter 3 Water Quality Objectives: incorporate guidance from Title 22 for utilizing the applicable “Recommended”, “Upper”, or “Short Term” concentrations included in Table 64449-B; clarify consideration of natural background concentrations; and specify annual averaging for surface water and appropriate long-term averaging for groundwater. ▪ Under Chapter 4 Implementation: • Consider “Recommended” concentrations as goals and allow concentrations ranging to the “Upper” level if it is demonstrated that it is neither reasonable nor feasible to achieve lower levels. “Short Term” level may be authorized on a temporary basis consistent with Title 22 or with the Drought and Conservation Policy • Clarify the use of filtered samples using a 1.5-micron filter to remove suspended solids to measure compliance for aluminum, color, copper, iron, manganese, silver, turbidity and zinc. The Central Valley Water Board may adjust the filter size where necessary to more accurately represent site-specific conditions based on scientific evidence submitted for their consideration and after consultation with Division of Drinking Water and public comment

Table ES - 1. Description of Major Components of the Proposed Salt and Nitrate Control Program

Component	Description
Guidance for Developing Alternative Compliance Projects (ACP) for Nitrate Discharges	When an individual or group of permittees is unable to demonstrate that their discharge is not individually or collectively causing or contributing to nitrate degradation above the triggers identified in the Nitrate Control Program, they have an opportunity to request either allocation of available assimilative capacity or an exception. In most cases, the request for the granting of assimilative capacity[2] or an exception in these circumstances requires submittal of a proposed ACP. This request may be made as an individual permittee (which includes a third party group subject to a general order) or permittees working collaboratively as part of a groundwater management zone. Any proposed ACPs submitted for consideration must contain specific components; accordingly, guidance is provided that describes the components recommended for submittal of an ACP for approval. At a minimum any proposed ACP must include but is not limited to: • Identification of public water supply and domestic wells within the discharge area zone of contribution that exceed the nitrate water quality objectives • Milestones and timelines to address the drinking water issues (short and long-term) • Milestones and timelines to meet long term management goals of balanced loading and restoration, which may be phased over time
SMCL Considerations when Developing WDRs	Source water protection is a critical component to protect drinking water consumers. Since clarifications are proposed to address the application of SMCLs to protect MUN, guidance is also proposed on considerations when evaluating permit conditions related to SMCLs in order to clarify the current process of evaluating potential individual and cumulative impacts on instream and downstream beneficial uses.
Definitions Specific to Salt and Nitrate Control Program	A series of definitions have been proposed for incorporation as part of the Salt and Nitrate Control Program amendment in order to add clarity and provide consistency in implementation.

Salt Control Program

The Salt Control Program is a three-phased adaptive management approach strategy (Figure S-1 of the Basin Plan Amendment Language) that applies to both surface and ground waters in the Central Valley developed to meet the following goals:

- Control the rate of degradation through a “managed degradation” program;
- Implement salinity management activities to achieve long-term sustainability and prevent continued impacts to salt sensitive areas; and
- Protect beneficial uses by maintaining water quality that meets applicable water quality objectives and pursuing long-term managed restoration where reasonable, feasible and practicable.
- Protect beneficial uses by applying appropriate antidegradation requirements for high quality water

Each of the three phases has a duration of ten years that can be extended up to 15 years with Executive Officer approval. Phase I is the development of a Prioritization and Optimization Study (P&O Study) and will be implemented upon the effective date of this amendment. The Salt Control program is structured to encourage permittees that discharge salt and entities

[2] Conditions with respect to granting of assimilative capacity will vary, depending on how the receiving water is defined for the discharge(s) in question. In some cases, the receiving water will be considered to be shallow groundwater, while in others, it may be the upper zone .

responsible for the movement of salt throughout the Central Valley and those that use Central Valley waters outside of the Central Valley to participate and fund the P&O Study. Level of participation in the P&O Study will be determined by a lead entity. The Central Valley Salinity Coalition (CVSC) is the intended lead of the P&O Study. Development and implementation of the P&O Study will be discussed in an open stakeholder process through the CV-SALTS Executive Committee or similar process approved by the Executive Officer.

Within one year of the effective date of the Basin Plan amendments the Central Valley Water Board will issue a Notice to Comply (NTC) with the Salt Control Program to permittees that discharge salt in the Central Valley Region. The permittees will have two compliance pathways from which to choose to comply with the Salt Control Program. No later than six months after receiving the NTC, permittees shall notify the Central Valley Water Board of its decision of which compliance pathway with documentation to support its decision (Table S-1 of the Basin Plan Amendment Language):

1. *Conservative Salinity Permitting Approach*, utilizes the existing regulatory structure that under Phase I focuses on source control, use of conservative permit limits, and limited use of assimilative capacity and/or compliance time schedules.

2. *Alternative Salinity Permitting Approach*, is an alternative approach to compliance through support of the facilitation and completion of the P&O Study. Discharges of salt to waste management units subject to the containment requirements of Division 2 of Title 27 of the California Code of Regulations are not eligible to be permitted under the Alternative Salinity Permitting Approach.

The conservative salinity permitting approach is the default-permitting pathway. A permittee must elect and notify the Central Valley Water Board to be permitted under the alternative salinity permitting approach.

The Conservative Salinity Permitting Approach assumes a discharge of salt will not degrade the receiving water. In this approach, staff assumes very conservative salinity values for protection of beneficial uses and limits availability of assimilative capacity.

Permittees electing the Alternative Permitting Approach will be required to maintain performance based salt limits when applicable, continue to implement salinity management practices and maintain existing salt discharge concentration or loading levels. Assimilative capacity may be granted for salinity at the discretion of the Central Valley Water Board. Under this approach, dischargers of salt regulated by an NPDES permit are eligible for a conditional salinity variance. For non-NPDES dischargers of salt, compliance with the P&O Study will be deemed as compliance with applicable basin plan requirements.

The P&O study will identify groundwater basins that may serve as salt management areas provided Basin Plan amendments are done to de-designate one or more beneficial uses due to salinity. Permittees with discharges of salt to these locations are required to participate in the Phase I Salt Control Program.

New permittees of salt, or existing permittees seeking permit modifications due to a substantial and/or material change to a facility that negatively impacts its salt discharges, shall indicate in its Report of Waste Discharge how the permittee intends to comply with the Salt Control Program.

The Salt Control Program establishes key milestones and an implementation schedule for the Phase I P&O Study (Table S-2 and Figure S-2 of the Basin Plan Amendment Language). Where key milestones are not met, or where the Central Valley Water Board finds reasonable progress is not being made towards achieving the milestones, the Board will notify all permittees in the

Alternative Salinity Permitting Approach of its findings. Failure to comply with the requirements in the notice will result in all permittees under the Alternative Permitting Approach to be subject to the requirements of the Conservative Salinity Permitting Approach.

At the completion of Phase I and prior to implementation of subsequent Phases, the Central Valley Water Board will re-evaluate the permitting compliance pathways to determine if they should be modified or continued. Basin Plan amendments to implement the determination and notification to the effected dischargers will be completed prior to the initiation of subsequent phases of the Salt Control Program.

The Salt Control Program proposed through this Basin Plan Amendment does not alter, revise or supersede the requirements and standards established through the Bay-Delta Plan that apply to permittees that discharge salt to the Delta. The proposed Salt Control Program does not alter, revise or supersede the Delta Strategic Plan approved by the Central Valley Water Board in 2008 and updated in 2014. The proposed Salt Control Program sets forth a phased control program with adequate measures to ensure controllable sources of salts remain at current levels and are not increased unless the permittee can adequately demonstrate such increases will not impact downstream users or that such discharges are compliant with the Drought and Conservation Policy also proposed by these Amendments.

Nitrate Control Program

The Nitrate Control Program is a prioritized program and applies only to groundwaters designated with the municipal and domestic supply (MUN) beneficial use, and was developed to achieve the following management goals:

Goal 1 – Ensure a Safe Drinking Water Supply;
Goal 2 – Achieve Balanced Salt and Nitrate Loadings; and,
Goal 3 – Implement Managed Aquifer Restoration where reasonable, feasible and practicable.

The Nitrate Control Program is prioritized to first address health risks associated with drinking water that exceeds the nitrate primary maximum contaminant level. Groundwater Basins/Sub-basins[3] have been prioritized based on ambient nitrate conditions (Table N-1 and Figure N-1 of the Basin Plan Amendment Language) and timelines for implementation of the Nitrate Control Program are established. Implementation of the Nitrate Control Program in non-prioritized basins and sub-basins will occur as directed by the Central Valley Water Board's Executive Officer. In areas of the Central Valley where there are no identified groundwater basins or sub-basins, the Nitrate Control Program will apply when the Board's Executive Officer determines it is necessary and appropriate and notifies the permittee accordingly (Table N-2 of the Basin Plan Amendment Language).

No later than 1 January 2024, the Central Valley Water Board will review and may adjust the priorities established through the SNMP after considering water quality-based factors and other relevant information. Basins identified in Priority 1 and 2 have specific timelines for implementation of the Nitrate Control Program requirements. The remaining basins will be prioritized at the discretion of the Central Valley Water Board.

3 The prioritized Groundwater Basins/Sub-basins identified in the public draft, including identification per DWR's Bulletin 118, are from Luhdorff and Scalmanini Consulting Engineers and Larry Walker Associates (2016a), and the Central Valley Water Board may adjust these priorities during a public review process.

This program provides the Central Valley Water Board authority to allow alternative compliance mechanisms in place of traditional permitting determinations. Permittees must request an Alternative Compliance Project (ACP) (Appendix H) approach subject to public review and comment. Implementation and enforcement of the ACP is through a permittee's Waste Discharge Requirements. A fundamental element of any ACP is that it must ensure that safe drinking water is provided to parties impacted by nitrate contaminated drinking water.

To protect groundwaters that are not contaminated by nitrates, the Nitrate Control Program establishes a nitrate trigger value that is 75% of the primary MCL of 10 mg/L (NO_3-N). The nitrate trigger is not a water quality objective but establishes a threshold value that requires additional actions by both the Central Valley Water Board and permittees when trigger levels are exceeded.

The Central Valley Water Board will issue Notices to Comply according to the schedule prescribed in the Nitrate Control Program (Table N-2 of the Basin Plan Amendment Language). The Board's Executive Officer retains discretion to adjust the timelines based on available resources.

For existing permittees of nitrate [4] implementation of the Nitrate Control Program occurs when a Notice to Comply is received from the Central Valley Water Board.

New dischargers of nitrates located in a groundwater basin/sub-basin regardless of priority, or those with a material change to their operation that increases the level of nitrate discharged to groundwater must comply with the Nitrate Control Program. This provision does not apply to dischargers located in areas that are not part of a designated groundwater basin/sub-basin unless notified by the Executive Officer.

Communities that are impacted by nitrates may petition the Central Valley Water Board to request a basin, sub-basin, or portion thereof be required to comply with the Nitrate Control Program. Permittees in priority basins may request that the Central Valley Water Board defer the issuance of a Notice to Comply for a sub-area of the basin to correspond with the schedule for a lower priority basin. Documentation is required for community and/or permittee requests as noted in the Nitrate Control Program under Issuance of Notice to Comply.

Permittees that receive a Notice to Comply with the Nitrate Control Program from the Central Valley Water Board must choose between two compliance pathways *(*Figure N-2 of the Basin Plan Amendment Language*)*:

1. *Path A –Individual Permitting Approach*

   Path A is utilized when an individual discharger (or third-party group subject to a General Order wishing to proceed under Path A) decides to comply with the nitrate requirements as

4 For the purposes of the Nitrate Control Program, the term "existing permitted dischargers" means dischargers subject to individual Waste Discharge Requirements, dischargers regulated as individual facilities under General Waste Discharge Requirements (e.g., facilities regulated under the Waste Discharge Requirements General Order for Existing Milk Cow Dairies), facilities or discharges subject to Conditional Waivers, or dischargers subject to General Waste Discharge Requirements that are regulated through a Third Party (e.g., dischargers regulated under Irrigated Lands Regulatory Program's Third-Party General Orders). For those dischargers that are part of a third party group, notifications required by the Nitrate Control Program may be issued to and received from the Third Party group on behalf of their members, who in turn will be responsible for notifying its members.

an individual/third party, or in circumstances when a management zone is not an available option.

Nitrate discharge impacts to groundwater are assessed in the shallow zone that represents the area of the aquifer available for use by the shallowest domestic wells (Figures 2-4 and 2-5). The Nitrate Control Program establishes conservative methodologies for determining the ambient nitrate concentrations in the shallow zone. The Nitrate Control Program establishes five categories of nitrate discharges (Table N-3 of the Basin Plan Amendment Language) used to determine how a permittee electing Path A will be permitted to discharge. The Central Valley Water Board will determine which nitrate category applies.

Existing permittees of nitrate electing an individual permit - Path A shall conduct an initial assessment of their discharge as it relates to nitrate upon receipt of a Notice to Comply. The initial assessment shall be submitted as part of a Notice of Intent and must contain the required elements prescribed in the Nitrate Control Program.

Path A is the default-permitting pathway. A permittee must affirmatively elect and notify the Central Valley Water Board to be permitted under Path B.

2. *Path B –Management Zone Approach*

Path B is utilized when multiple dischargers/permittees elect to participate in a management zone as the preferred method for complying with the Nitrate Control Program *(*Figure N-2 of the Basin Plan Amendment Language*)*.

Discharges of nitrate within a Management Zone are not categorized like discharges in Path A, and impacts to groundwater are assessed collectively in the upper zone that is the portion of groundwater basin, subbasin or management zone from which most domestic wells draw water (Figures 2-4 and 2-5). Availability and allocation of assimilative capacity are determined by the Central Valley Water Board based on a volume-weighted average of nitrate concentrations in the Upper Zone.

The Central Valley Water Board finds Path B - Management Zones to be a regulatory option that is both appropriate and preferable for many areas of the Central Valley as it maximizes resources to address the nitrate contamination, and provides a more integrated approach to developing local solutions.

Existing permittees electing the Management Zone permitting approach - Path B must work cooperatively with other permittees and local stakeholders and prepare and submit all the required documents to participate in a Management Zone (Table N-5B of the Basin Plan Amendment Language). Upon receipt of a Notice to Comply, the permittees in the Management Zone must prepare and submit a single Preliminary Management Zone Proposal for a geographic area they are proposing to establish as a Management Zone. A Preliminary Management Zone Proposal must include all the information within the time schedule prescribed in the Nitrate Control Program. Permittees that are identified as an Initial Participant in a Management Zone shall be presumed to be electing Path B for complying with the Nitrate Control Program, unless they otherwise notify the Central Valley Water Board of their intent to withdraw from Path B.

After Executive Officer approval of the Preliminary Management Zone proposal, participants must prepare and submit a Final Management Zone Proposal. The Final Management Zone

proposal must include all information from the Preliminary Management Zone Proposal, updated as necessary, and contain all the minimum prescribed information in the Nitrate Control Program and posted for public review and comment for at least 30 days. The Executive Officer determines if the Final Management Zone Proposal meets requirements of the Nitrate Control Program. A complete Final Management Zone Proposal functions as an equivalent to a Report of Waste Discharge for all existing permittees that are participating in the Management Zone.

A detailed Management Zone Implementation Plan must be submitted six months after approval of the Final Management Zone Proposal. The implementation plan indicates the method of compliance; i.e. through the allocation of assimilative capacity or through an exception to meeting the water quality objective (as defined in the Definitions and Terminology Section of the Basin Plan Amendment Language). The Management Zone Implementation Plan is the equivalent to an Alternative Compliance Project (as defined in the Definitions and Terminology Section of the Basin Plan Amendment Language). The Management Zone Implementation Plan is subject to public review and comment and must be approved by the Central Valley Water Board.

A Management Zone Implementation Plan must be reviewed periodically, and modified as appropriate. Any modifications that impact or change timelines, milestones or deliverables in the Plan must be approved by the Central Valley Water Board. Failure to implement or revise the Management Zone Implementation Plan in accordance with the Nitrate Control Plan will result in dischargers within that Management Zone being directed by the Executive Officer to comply with the Nitrate Control Program via Path A.

New dischargers that propose to discharge new or additional levels of nitrate[13], or existing permittees seeking a permit modification due to a material change to a facility that will increase nitrate discharges (either in volume or concentration), shall submit initial assessment information at the time of submittal of the Report of Waste Discharge. The discharger shall indicate how they intend to comply with the Nitrate Control Program, i.e., Path A or Path B, if a management zone exists.

Key Components of Nitrate Permitting Strategy

Early Action Plan

Regardless of whether a permittee chooses Path A or B, all permittees must assess nitrate levels in groundwater that may be impacted by nitrate in their discharge(s) over a 20-year planning horizon. If drinking water is impacted or threatened to be impacted a permittee shall submit an Early Action Plan (EAP). An EAP includes specific actions and a schedule of implementation to address the immediate needs of those drinking groundwater that exceeds the drinking water standard for nitrate. The timing of the submittal of the EAP depends on whether a permittee chooses permitting Path A or B. To be deemed complete, an EAP must at a minimum include the prescribed elements contained in the Nitrate Control Program. An Early Action Plan may be part of an Alternative Compliance Project.

Allocation of Assimilative Capacity

The allocation of assimilative capacity by the Central Valley Water Board shall be determined based on the nitrate permitting strategy pathway. For Path A assimilative capacity will be based

[13]In cases where there is an ownership transfer of a facility and where the level of nitrate being discharged does not change, an initial assessment may not be necessary.

on the quality of the groundwater in the shallow zone. For Path B assimilative capacity will be based on a volume-weighted average of groundwater quality in the upper zone and a condition that the quality will not exceed a trigger level of 75% of the nitrate water quality objective over a 20-year timeframe. For Path B, the Board will typically require an Alternative Compliance Project as a condition to granting any assimilative capacity. For Path A, the Board will determine the need for an ACP on a case-by-case basis.

Exceptions to Meeting the Water Quality Objective for Nitrate

The Nitrate Control Program establishes a new Exceptions Policy for nitrate. Using the authority provided under the Exceptions Policy, the Central Valley Water Board may authorize a discharge that may violate applicable water quality standards in the receiving groundwater basin[5] provided safe drinking water is provided to users of the nitrate contaminated water. Exceptions are used when there is no feasible, practicable or reasonable means for a discharge to meet water quality objectives within a time schedule typically allowed by the Board (i.e. 10 years or less) and it is not feasible, practicable or reasonable to prohibit the discharge. An Exception is available to permittees under Path A or Path B where assimilative capacity in the groundwater basin is not available. Exceptions are not intended to be a permanent waiver from compliance obligations. They are time bound, subject to conditions and reviewed periodically.

Alternative Compliance Projects

An Alternative Compliance Project (ACP) is a project proposed by a permittee or permittees and must assure short and long-term safe drinking water supplies while moving toward long-term managed restoration. An ACP is used to support a request for allocation of available assimilative capacity above certain triggers or to request use of an Exception. Under Path A, the ACP is submitted with the Notice of Intent, while under Path B the Management Zone Implementation Plan will serve as the ACP. An ACP must assure a significantly better outcome for the people of California than would occur under strict compliance with waste discharge requirements. As part of an ACP for nitrate, permittee(s) will need to show that groundwater users down-gradient of the discharge(s) have drinking water that meets applicable state and federal standards. ACPs may include both emergency actions (e.g., bottled water) in the short-term, permanent solutions (such as well-head treatment or alternative drinking water supplies) in the intermediate term, and efforts to re-attain the water quality objective (where feasible and practicable) over the long-term. Any short and/or long-term drinking water solutions must be developed with participation and concurrence of those benefiting from the project(s). Criteria for development of an ACP are included in the Nitrate Control Program.

ADDITIONAL POLICIES TO SUPPORT IMPLEMENTATION OF THE SALT AND NITRATE CONTROL PROGRAMS

Conditional Prohibition of Discharge for Surface and Groundwater discharges

The Salt and Nitrate Control Program requires actions by both dischargers and Central Valley Water Board staff. To fully implement the Salt and Nitrate Control program staff will amend, revise, renew or develop new waste discharge requirements or other orders to impose the requirements of the Salt and Nitrate Control Program. Staff resources may constrain staff's ability to do this in a timely manner. As a bridge to ensure compliance and timely

[5] Exceptions from compliance with water quality standards in a groundwater basin is similar to the concept of a "variance" for surface waters. The key distinction is that exceptions are governed exclusively by state law and variances are subject to both state and federal authority. See, for example, Resolution. No. R5-2014-0074.

implementation of the Salt and Nitrate Control Program, these proposed amendments establish Conditional Discharge Prohibitions of salt discharges to surface and groundwater and nitrate dischargers to groundwater. The conditional prohibition applies to all permitted dischargers of salt and nitrate upon receipt of a Notice to Comply with the provisions of the Salt and Nitrate Control Program. Once applicable, the prohibition will remain in effect until such time the permittees' existing waste discharge requirements are updated or amended to reflect Control Program Requirements. The Conditional Prohibition will not apply to permittees regulated by an Irrigated Lands General Order, instead they will be required to comply with the Salt and Nitrate Control Program through an amendment to the Irrigated Lands General Orders.

Variance Program for Salinity Water Quality Standards for Surface Water Discharges Subject to NPDES Permits Only

Variances are most commonly employed when there is no feasible, practicable or reasonable means for a point source discharge to surface water governed under the federal Clean Water Act, to meet water quality standards, when evaluating if a beneficial use or water quality standard represents the highest attainable condition consistent with federal regulations, or when a use or standard is unattainable today (or for a limited period of time) but feasible progress could be made toward attaining the designated use and criterion in the future. The current Variance Policy contains provisions for a streamlined salinity variance for a group of permittees with similar discharge characteristics that meet the above criteria. The salinity variance was to sunset with submittal of the CV-SALTS SNMP unless recommended for extension. The Salt and Nitrate Control Program recommends extension of the sunset date to coincide with completion of the P&O Study and that only permittees participating in the P&O Study be eligible for the salinity variance.

Exceptions from Basin Plan Provisions and Water Quality Objectives Other Than Nitrates for Groundwater and for Non-NPDES Dischargers to Surface Water

In addition to the discussion provided above for exceptions to the nitrate water quality objective for MUN, further amendments will be made to the current Exceptions policy provided in the Basin Plans.

The current Exceptions Policy only provides guidance for a limited number of salinity constituents (EC, TDS, chloride, sulfate and sodium) (Central Valley Water Board, 2014). This proposed amendment policy recommends revisions to the existing policy to provide guidance on obtaining exceptions for nitrates and boron in WDRs. In addition, the current Salinity Exceptions Policy is scheduled to sunset on 30 June 2019. This amendment proposes to remove the sunset date and limit terms for exceptions for salinity, nitrate or boron. Terms will generally not exceed 10-years; however, the Central Valley Water Board shall have the discretion to adopt an exception for longer than 10 years if the applicant(s) can demonstrate that it is necessary to further the management goals of the Salt or Nitrate Control Programs. The Central Valley Water Board has the authority to reauthorize (renew) an exception for one or more additional terms, the length of which shall be determined by the Board but may only exceed 50 years if the management practices under the exception are resulting in significant, measurable and continuing improvements in water quality. The authorization of an exception, or any reauthorization, shall require approval of the Board, after public notice and hearing. Status reports are required every five years with review conducted in a public hearing.

Under Phase I of the Salt Control Program, permittees that are in compliance with the conditions established by the Alternative Permitting Approach are in compliance with their

salinity limits. Additional conditions for exceptions to water quality objectives for salinity under Phase II and Phase III of the Salt Control Program may be incorporated in the future.

Drought and Conservation Policy for Surface and Groundwater

The proposed Basin Plan Amendments include incorporation of interim salinity permit limits that are in effect during droughts or through conservation and recycling. The policy establishes interim limits that are available for permittees who have documented that conservation or recycling is causing increased salinity in their discharge. The interim limits will not exceed an EC concentration of 2,200 uS/cm as a 30-day running average, or an equivalent measure in terms of concentration or TDS load. Concentration and loading limits shall not apply at the same time.

Further, the policy allows that permittees discharging to groundwater who document long-term commitment (20+ years) to water conservation and/or water recycling efforts may be eligible to use a long-term (10+ year) flow-weighted average to calculate compliance with effluent and or groundwater limitations.

The Drought and Conservation Policy is proposed to guide interim effluent limits as needed under the Variance Policy during Phase 1 of the Salt Control Program and may become generally applicable during future phases based upon review of the overall program.

Offsets for Groundwater Only

The proposed Basin Plan Amendment recommends an Offsets Policy for discharge of salt and nitrate to groundwater. An offset is an alternative means of achieving compliance with Waste Discharge Requirements (WDRs) either alone or in combination with other actions, for a given pollutant or pollutants authorized by the Central Valley Water Board. The decision to pursue an offset is voluntary. Offsets must be:

(1) Proposed by the permittee[6] as an Alternative Compliance Project (ACP)

(2) Approved by the Central Valley Water Board; and

(3) Enforced through a WDR or other order issued by the Board.

Requirements that apply to offsets are documented in the amendment language contained in the Offsets Policy.

Application of Secondary Maximum Contaminant Levels to Protect MUN for Surface and Groundwater

Current Basin Plan language simply incorporates the Secondary Maximum Contaminant Level (SMCLs) tables from Title 22 California Code of Regulation and not the contextual language. Lack of contextual language has led to inconsistent application of the SMCLs as permit limits, and conservative application of SMCLs can limit a permittee's ability to discharge water which is otherwise available for reuse. The proposed Basin Plan Amendments recommend revisions to the Water Quality Objectives Chapter 3 (Chemical Constituents) and to the Implementation Chapter 4 to clarify the intent and use of applying the SMCLs in permitting actions by staff.

[6] Throughout this document the term "permittee" can connote either an individual permittee or a coalition of dischargers regulated under a common set of categorical WDRs or watershed/groundwater basin/subbasin permit or order, or permittees working collaboratively within a management zone.

SURVEILLANCE AND MONITORING PROGRAM FOR SURFACE AND GROUND WATER

The overarching goals of the Salt and Nitrate Surveillance and Monitoring Program are to:

- Periodically assess the effectiveness of the Salt and Nitrate Control Programs and, if appropriate, support efforts to re-evaluate the requirements of the control program.
- Develop representative ambient water quality and trend information for Total Dissolved Salts (TDS)/Electrical Conductivity (EC) and Nitrate as Nitrogen.
- Maximize the use of existing monitoring programs to provide needed data and avoid duplication of efforts.

The Central Valley Water Board will require permittees discharging salt and nitrate to provide information to the Board to satisfy the monitoring goals. This information may come from, but not be limited to, permittees' monitoring efforts; consolidated or regional monitoring programs conducted by state or federal agencies or collaborative watershed efforts; or special studies evaluating effectiveness of management practices. Information gathered will be consolidated and evaluated by the entity leading the Monitoring Study and a summary report will be submitted to the Board every five years.

Recommendations to Other Agencies

The need to control and abate the impacts from increasing salinity through implementation of the Salt Control Program in the Central Valley is an important priority for the State of California, is critically important to the long-term sustainability of the Central Valley and its water supply, and is consistent with the goals and objectives of the California Strategic Growth Plan (California Bond Accountability, 2008). Failure to control salts will result in a decline of Central Valley surface and groundwater quality at an enormous cost to all water users of Central Valley waters. Due to the complexity and far-reaching impacts of salt management in the valley, the Central Valley Water Board has determined that all users of Central Valley waters, within and outside of the Board's jurisdictional area, are considered stakeholders responsible for the successful implementation of the Salt Control Plan. This will require significant participation and actions by federal, state, local agencies, districts, associations and other entities that use, transport or otherwise impact Central Valley's waters. These amendments propose recommended actions that should be taken by other governmental and public agencies and organizations to implement the Salt Control Program. A key recommendation applicable to all parties identified is for these entities participate in the P&O Study to be done under Phase I, and in the other two phases of the Salt Control Program as appropriate. Participation in the Phase I P&O Study may be done by providing financial, technical and policy support to the P&O Study. This participation is essential as findings from the P&O Study will direct the implementation of physical and non-physical projects in the phased Salt Control Program and coordination. An ongoing effort will be required to identify all stakeholders and to determine their financial responsibility and needed level of participation

AMENDMENT LANGUAGE FOR THE SACRAMENTO RIVER AND SAN JOAQUIN RIVER BASIN PLAN AND TULARE LAKE BASIN PLAN

The following sections identify proposed amendments to the Water Quality Control Plans for both the Sacramento River and San Joaquin River Basins and the Tulare Lake Basin (Basin Plans). Where the proposed changes to the Basin Plan revise existing language, text additions to the existing Basin Plan language are underlined and *italicized*. Text deletions to the existing Basin Plan are in ~~strikethrough~~.

For proposed amendments that add new sections to the Basin Plans, the new section is noted but not presented in underlined italics to facilitate clarity.

The following summarizes components of the proposed amendments:

Chapter 3 Water Quality Objectives

- Application Water Quality Objectives—Fourth Point (revision)
- Secondary Maximum Contaminant Levels (revision)

Chapter 4 Implementation

- Salt and Nitrate Control Program (new)
    - Program to Control and Permit Salt Discharges to Surface and Groundwater
        - Conservative Permitting Approach
        - Alternative Permitting Approach
        - Schedule of Implementation
        - Required Deliverables
        - Edits specific to the Tulare Lake Basin Plan Salinity Limits (revision)
    - Program to Control and Permit Nitrate Discharges to Groundwater (new)
        - Priority Basins and Subbasins
        - Permitting Approaches
            - Pathway A: Individual
            - Pathway B: Management Zone Approach
        - Schedule of Implementation
        - Required Deliverables by Pathway
            - Early Action Plans
            - Implementation Plans for Long-term Sustainability
    - Conditional Prohibition of Salt and Nitrate Discharges
    - Surveillance and Monitoring Program
    - Recommendations to Other Agencies
    - Definitions and Terminology Specific to the Salt and Nitrate Control Program
- Supporting Policies
    - Variance Policy (revised)
    - Exceptions Policy (revised)
    - Drought and Conservation Policy (new)
    - Offsets Policy (new)
- Application of Secondary Maximum Contaminant Levels to Protect Municipal and Domestic Supply (new)
- Estimated Costs to Agriculture

Appendix XX

- Nitrate Control Program Non-Prioritized Groundwater Basins (new)

CHAPTER 3 WATER QUALITY OBJECTIVES

The following edits are proposed for the Sacramento River and San Joaquin River Basin Plan's *Chapter 3 Water Quality Objectives* in the sections indicated below.

Points That Apply to Water Quality Objectives

Modify the Basin Plan in Chapter 3 Water Quality Objectives under the heading, “Water Quality Objectives” as follows:

The **fourth point** is that the *Central Valley Water Board*~~Regional Water Board~~ recognizes that immediate compliance with water quality objectives adopted by the *Central Valley Water Board* ~~Regional Water Board~~ or the State Water Board, or with water quality criteria adopted by the USEPA, may not be feasible in all circumstances. Where the *Central Valley Water Board* ~~Regional Water Board~~ determines it is infeasible for a discharger to comply immediately with such objectives or criteria, compliance shall be achieved in the shortest practicable period of time (determined by the *Central Valley Water Board*~~Regional Water Board~~), not to exceed ten years after the adoption of applicable objectives or criteria*, or for some specific pollutants, the Central Valley Water Board*~~*Regional Water Board*~~ *may grant an Exception or Variance pursuant to the terms of those policies as set forth in Chapter IV, Implementation*. ~~This policy shall apply to water quality objectives and water quality criteria adopted after the effective date of this amendment to the Basin Plan [25 September 1995].~~ The *Central Valley Water Board*~~Regional Water Board~~ will establish compliance schedules in NPDES permits consistent with the provisions of the State Water Board’s Compliance Schedule Policy (Resolution 2008-0025). Time schedules in waste discharge requirements are established consistent with Water Code Section 13263.

CHAPTER 3 WATER QUALITY OBJECTIVES

The following edits are proposed for the Sacramento River and San Joaquin River Basin Plan's *Chapter 3 Water Quality Objectives* in the sections indicated below. Note that these changes are also proposed for the Tulare Lake Basin Plan.

Secondary Maximum Contaminant Level Policy

Modify the Basin Plan in Chapter 3 Water Quality Objectives under the heading, "Water Quality Objectives for Inland Surface Waters, Chemical Constituents" as follows:

Water Quality Objectives For Surface Waters

Waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses…

At a minimum*, unless there is an approved site specific objective*, *surface* water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCLs) specified in the following provisions of Title 22 of the California Code of Regulations (*Title 22*), which are incorporated by reference into this plan: Tables 64431-A (Inorganic Chemicals) and 64431-B (Fluoride) of *s*~~S~~ection 64431, *and* Table 64444-A (Organic Chemicals) of *s*~~S~~ection 64444, and Tables 64449-A (Secondary Maximum Contaminant levels-Consumer Acceptance Limits) and 64449-B (Secondary Maximum Contaminant Levels-Ranges) and of Section 64449. This incorporation-by-reference is prospective, including future changes to the incorporated provisions as the changes take effect. At a minimum, water designated for use as domestic or municipal supply (MUN) shall not contain lead in excess of 0.015 mg/l. The *Central Valley Water Board* ~~Regional Water Board~~ acknowledges that specific treatment requirements are imposed by state and federal drinking water regulations on the consumption of surface waters under specific circumstances. *Some MCLs may not be appropriate as an untreated surface water objective without filtration or consideration of site-specific factors*. To protect all beneficial uses the *Central Valley Water Board*~~Regional Water Board~~ may apply limits more stringent than MCLs.

The annual average of sample results will be used to evaluate compliance with the Secondary Maximum Contaminant Levels identified in Tables 64449-A or 64449-B.

In addition, for surface waters designated MUN the concentration of chemical constituents shall not exceed the "secondary maximum contaminant level" specified in Title 22, Table 64449-A or the "Upper" level specified in Table 64449-B, unless otherwise authorized by the Central Valley Water Board in accordance with the provisions of Title 22, section 64449 et seq. Constituent concentrations ranging to the "Upper" level in Table 64449-B are acceptable if it is demonstrated that it is not reasonable or feasible to achieve lower levels; in addition, constituents ranging to the "Short Term" level in Table 64449-B may be authorized on a temporary basis consistent with the provisions of section 64449(d)(3), pending construction of treatment facilities or development of new water sources, and/or consistent with the Drought and Conservation Policy (Section XX). In cases where the surface water natural background concentration of a particular chemical constituent exceeds the maximum contaminant level specified in Table 64449-A or "Upper" level specified in Table 64449-B, the surface

water shall not exceed that natural background concentration due to controllable anthropogenic sources, unless the Central Valley Water Board authorizes it consistent with State Antidegradation Policy.

Modify the Basin Plan in Chapter 3 Water Quality Objectives under the heading, "Water Quality Objectives for Ground Waters, Chemical Constituents" as follows:

Water Quality Objectives For Groundwaters

Chemical Constituents

Ground waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses.

At a minimum, unless there is an approved site specific objective, ground waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCLs) specified in the following provisions of Title 22 of the California Code of Regulations *(Title 22)*, which are incorporated by reference into this plan: Tables 64431-A (Inorganic Chemicals) and 64431-B (Fluoride) of *s*~~S~~ection 64431, *and* Table 64444-A (Organic Chemicals) of *s*~~S~~ection 64444, and Tables 64449-A (Secondary Maximum Contaminant levels-Consumer Acceptance Limits) and 64449-B (Secondary Maximum Contaminant Levels-Ranges) of Section 64449. This incorporation-by-reference is prospective, including future changes to the incorporated provisions as the changes take effect. At a minimum, water designated for use as domestic or municipal supply (MUN) shall not contain lead in excess of 0.015 mg/l. To protect all beneficial uses the *Central Valley Water Board* ~~Regional Water Board~~ may apply limits more stringent than MCLs.

For Secondary MCLs identified in Tables 64449-A and 64449-B, appropriate long-term averaging periods shall be used to evaluate ambient groundwater quality and annual averages of sample results will be used to determine compliance with Secondary Maximum Contaminant Levels for discharge limitations prescribed in Waste Discharge Requirements.

In addition, for ground waters designated MUN, concentration of chemical constituents shall not exceed the "secondary maximum contaminant level" specified in Title 22, Table 64449-A or the "Upper" level specified in Table 64449-B unless otherwise authorized by the Central Valley Water Board in accordance with the provisions of Title 22, section 64449 et seq. Constituent concentrations ranging to the "Upper" level in Table 64449-B are acceptable if it is demonstrated that it is not reasonable or feasible to achieve lower levels; in addition, constituents ranging to the "Short Term" level in Table 64449-B may be authorized on a temporary basis consistent with the provisions of section 64449(d)(3) and/or consistent with the Drought and Conservation Policy (Section XX). In cases where the natural background concentration of a particular chemical constituent exceeds the maximum contaminant level specified in Table 64449-A or "Upper" level specified in Table 64449-B, the ground water shall not exceed that natural background concentration due to controllable anthropogenic sources, unless the Board authorizes it consistent with State Antidegradation Policy.

CHAPTER 4 IMPLEMENTATION

Following is a summary of a proposed addition for the Sacramento River and San Joaquin River Basin Plan and the Tulare Lake Basin Plan. The text noted below will comprise a new section under *Chapter IV—Implementation* within each Basin Plan.

Salt and Nitrate Control Program

The Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) initiative developed a comprehensive salt and nitrate management plan (SNMP) for the Central Valley Region, which was submitted to the Central Valley Water Board in January of 2017.[7] The SNMP is the basis for many components of this Salt and Nitrate Control Program and serves as one of the reference documents for the control efforts. The SNMP documented elevated salt and nitrate concentrations in portions of the Central Valley that impair or threaten to impair the region's water and soil quality which, in turn, adversely affects agricultural productivity and/or drinking water supplies. Excessive nitrates are significant issues for public health and safety in some areas. Based on the findings, the Central Valley Salt and Nitrate Control Program is designed to address both legacy and ongoing salt and nitrate accumulation issues in surface and groundwater; however, the primary focus of early actions (first ten years) is on groundwater quality and in particular nitrate impacts to drinking water supplies. The over-arching management goals and priorities are:

1. Ensure Safe Drinking Water Supply (short and long term)
2. Achieve Balanced Salt and Nitrate Loading
3. Implement Long-Term, Managed Restoration of Impaired Water Bodies

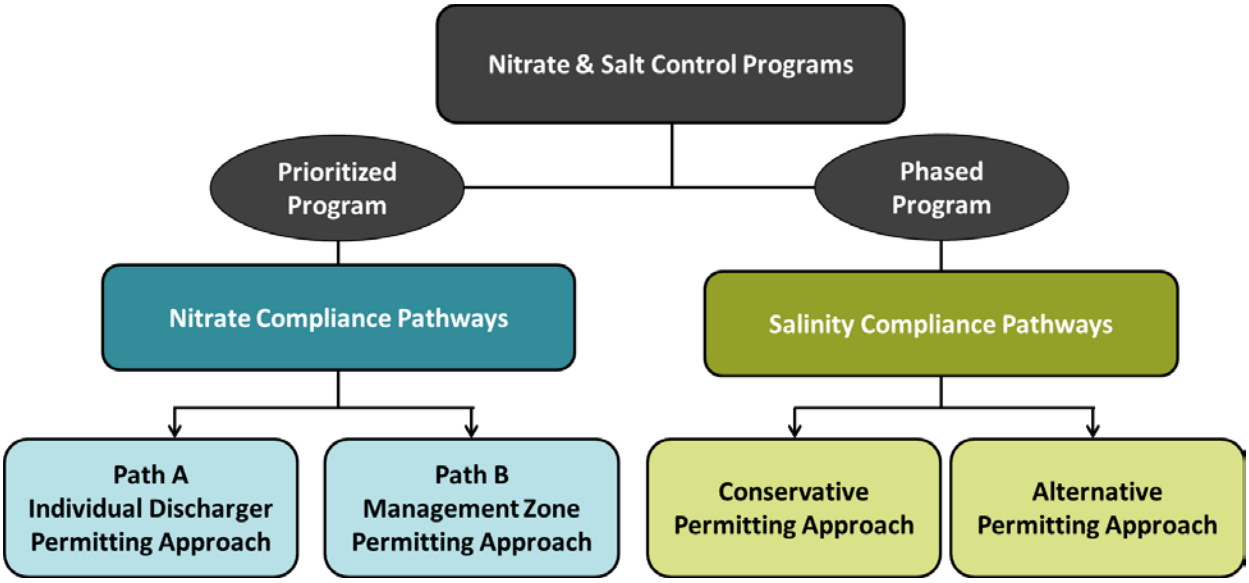
To meet these prioritized goals, the Salt and Nitrate Control Program has been phased with specific implementation activities required for salt and another set of implementation activities required for nitrate. Both implementation approaches provide permittees the option to select their means of compliance: either through a conservative permitting approach focused on individual source control or through an alternative coordinated, multi-discharger management approach (Figure I-1). For goals 2 and 3, the Salt and Nitrate Control Program recognizes that in some circumstances meeting these goals may not be reasonable, feasible or practicable.

The Salt and Nitrate Control Program is implemented through a combination of Central Valley Water Board authorities. First, to ensure timely implementation, a Conditional Discharge Prohibition has been established in the Basin Plans that will require that certain permittees begin to implement provisions of the Control Program upon receiving a Notice to Comply issued by the Board's Executive Officer. The Conditional Discharge Prohibition will assist in establishing enforceable conditions until the Board revises permits to incorporate applicable requirements from the Control Program or determines that existing permit requirements are adequate. Second, for certain other permittees subject to General Orders, the Board will hold a hearing to consider amending such Orders within 18 months of the effective date of the Salt and Nitrate Control Program to incorporate timelines and milestones for complying with the Control Program. Long-term implementation of the Salt and Nitrate Control Program is achieved primarily through Board permitting actions (i.e., waste discharge requirements or conditional waivers); however, to be successful, coordination, funding and support will be required from multiple state, federal and local agencies as well as from local stakeholders and those benefitting from Central Valley waters. Additional implementation authorities, affected entities,

[7] CV-SALTS SNMP (2016)

and required actions related to salt and nitrate control will be determined during the first phase of the effort.

FIGURE I-1. SALT AND NITRATE MANAGEMENT STRATEGY



The following identifies the major components of the Salt and Nitrate Control Program and policies that support its implementation:

- Salt Control Program (Discharges to Surface and Groundwater)
- Nitrate Control Program (Discharges to Groundwater)
    - Prioritized Groundwater Basins
    - Management Zones
- Conditional Prohibition
- Surveillance and Monitoring
- Policies to Support Implementation
    - Variance Policy
    - Exception Policy
    - Drought and Conservation Policy
    - Offsets Policy
    - Application of Secondary Maximum Contaminant Levels to Protect MUN

This amendment was adopted by the Central Valley Water Board on 31 May 2018, and approved by the State Water Resources Control Board on ___(date)___. The Effective Date of the Salt and Nitrate Control Program shall be ___(date)___, the date of Office of Administrative Law approval. For those components subject to USEPA approval, the effective date shall be ____(date)___, the date of USEPA approval. The Salt and Nitrate Control Program will be reviewed in its entirety prior to initiation of Phase II of the Salt Control Program, but no later than 15 years after Office of Administrative Law approval.

Program to Control and Permit Salt Discharges to Surface and Groundwater

The Salt Control Program is a program for the control and permitting of salt discharges in the Sacramento-San Joaquin River Basins and in the Tulare Lake Basin and applies to all surface and ground waters. The Salt Control Program will be implemented in conjunction with and not replace the requirements of the *Control Program for Salt and Boron Discharges into the Lower San Joaquin River (LSJR)* adopted by Central Valley Water Board Resolution R5-2017-0062[8], site specific salinity objectives in the Bay-Delta Plan, or other site-specific salinity objectives adopted by the Central Valley Water Board or State Water Board.

Program Overview

Based on the CV-SALTS SNMP and its supporting studies, salt concentrations in surface and ground waters generally continue to increase over time under existing water quality management programs and strategies to control salt. Given these findings, the SNMP identified the need for the implementation of a salt management strategy with the following goals:

- Control the rate of degradation through a "managed degradation" program;
- Protect beneficial uses by applying appropriate antidegradation requirements for high quality waters.
    - Implement salinity management activities to achieve long-term sustainability and prevent continued impacts to salt sensitive areas; and
    - Protect beneficial uses by maintaining water quality that meets applicable water quality objectives and pursuing long-term managed restoration where reasonable, feasible and practicable.

The supporting studies evaluated local salt management options in areas with significant salt concerns. These evaluations demonstrated that the volume and mass of unmanaged salt would remain high even under scenarios where existing salt management tools are widely adopted. A comprehensive solution to the salinity issues in the Central Valley will therefore need to rely on both local and sub-regional solutions as well as broad region-wide projects that will export salt out of the Central Valley. Additional studies are still needed to further define the range of solutions for surface and ground waters that may be deployed within each Central Valley hydrologic region to prevent continued impacts to salt sensitive areas in the Central Valley Region.

Given the need for these studies, the Central Valley Water Board will implement a phased Salt Control Program consistent with the goals of the salt management strategy. All permitted salt discharges shall comply with the provisions of this program. Two pathways to compliance are available for Phase I. Compliance pathways for subsequent phases will be identified prior to that phase. The Phase I Compliance pathways are:

1. ***Conservative Salinity Permitting Approach***, utilizes the existing regulatory structure and focuses on source control, use of conservative salinity limits and limited use of assimilative capacity and/or compliance time schedules.

[8] In the LSJR Basin, management activities are addressing salinity impact to surface water but are not sufficient to address the long-term accumulation in the basin as a whole.

2. ***Alternative Salinity Permitting Approach***, is an alternative approach to compliance through implementation of specific requirements, rather than application of conservative limits. Under Phase I, permittees must support facilitation and completion of the Salinity Prioritization and Optimization Study. Discharges of salt to waste management units subject to the containment requirements of Division 2 of Title 27 of the California Code of Regulations are not eligible to be permitted under the Alternative Salinity Permitting Approach.

Phased Control Program

The Salt Control Program will be implemented in three phases, with each of the three phases having a duration of ten to fifteen years (Figure S-1). Some portions of a subsequent phase may occur or be initiated prior to the end of an existing phase. At the discretion of the Central Valley Water Board's Executive Officer, the completion date and interim milestones for any phase may be modified or extended. The findings from each phase will inform the next phase, allowing for implementation of an adaptive management approach to salt management in the Central Valley Region.

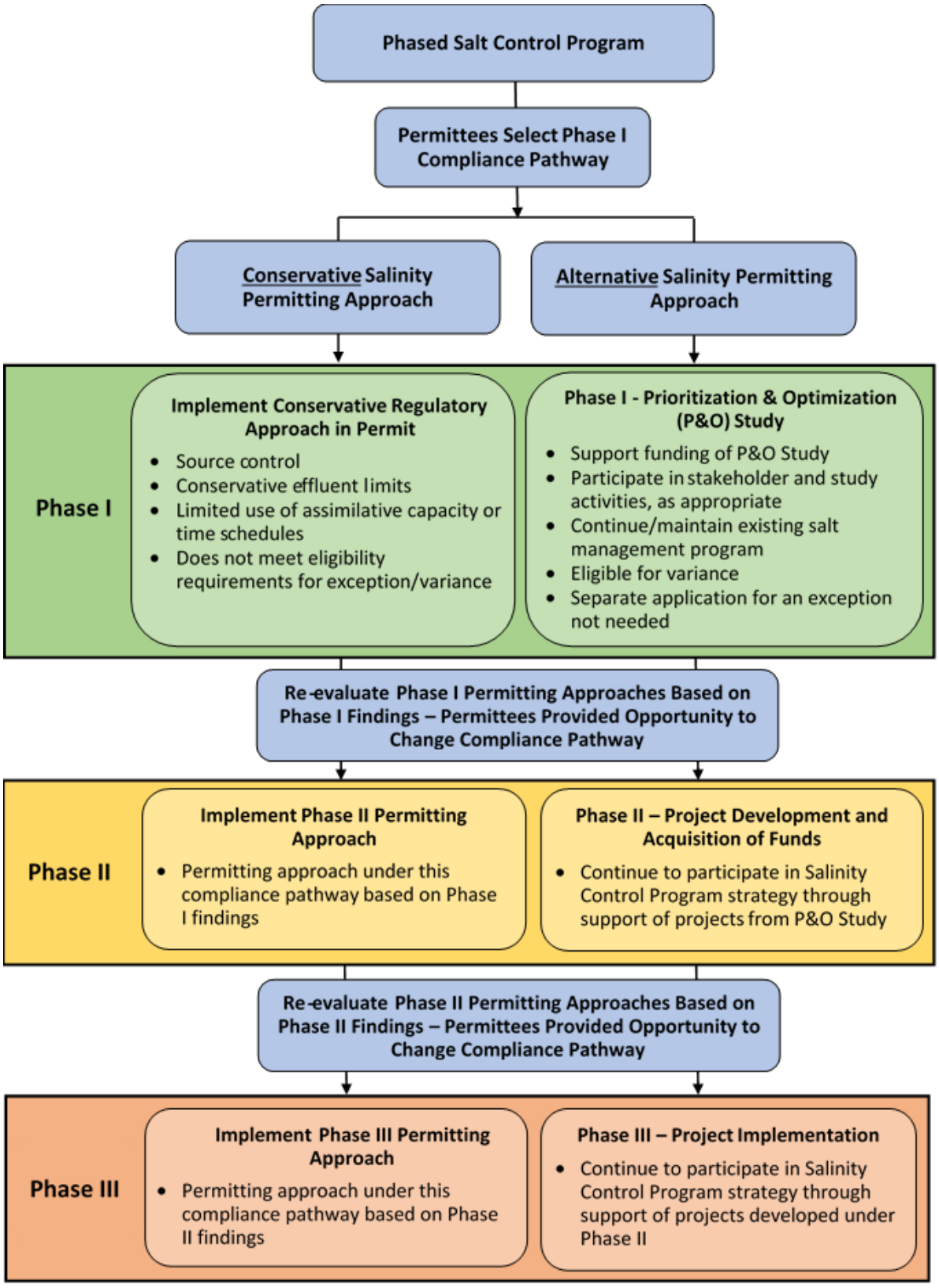
The phases of the Salt Control Program are linked to activities occurring under each the Alternative Salinity Permitting Approach, as follows:

Phase I – Prioritization and Optimization Study (P&O Study) - The P&O Study will facilitate the development of a long-term Salt Control Program to achieve the goals of the salinity management strategy by coordinating and completing tasks and securing funding. The P&O Study will:

- Develop groundwater and surface water-related salinity data and information for sensitive and non-sensitive areas for hydrologic regions within the entire Central Valley Region, including guidelines to protect salt-sensitive crops;
- Identify sources of salinity and actions that impact salinity in surface and ground waters;
- Evaluate impacts of state and federal policies and programs;
- Identify and prioritize preferred physical projects for long-term salt management (e.g. regulated brine line(s), salt sinks, regional/sub-regional de-salters, recharge areas, deep well injection, etc.);
- Develop the conceptual design of preferred physical projects and assess the environmental permitting requirements and costs associated with each of these projects;
- Identify non-physical projects and plan for implementation;
- Develop a governance structure and funding plan;
- Identify funding programs, including federal and state funds, and opportunities for future phase implementation; and
- Identify recommendations for Phase II of the Salt Control Program.

The P&O Study will inform Phases II and III of this Salt Control Program. Based on the findings of the P&O Study, the Central Valley Water Board must review the Basin Plan and consider whether modifications to the Basin Plan are required to facilitate implementation of Phases II or III.

FIGURE S-1: SALT CONTROL PROGRAM PATHWAYS TO COMPLIANCE



Phase II – Project Development and Acquisition of Funds - Phase II of this Salt Control Program will begin no later than at the end of Phase I, but some activities may be initiated during Phase I. Phase II includes the following key elements:

- Using available funding sources, complete the engineering design and environmental permitting of preferred physical projects identified in Phase I;
- Initiating or continuing implementation of preferred non-physical projects identified during Phase I and, if appropriate, identifying new preferred non-physical projects and the process or milestones for implementation; and
- Identifying sources and securing the funding to implement the preferred physical projects.

Phase III – Project Implementation - During Phase III, construction of preferred physical projects will be completed, unless already completed during Phase II. For large-scale capital projects, such as construction of a regulated brine line, construction may occur over multiple phases and additional time may be required to complete full build-out of the project.

Salt Control Program Implementation

Permittees will be subject to Phase I of the Salt Control Program from the issuance of the Notice to Comply until **date*** (ten years from the effective date of the Basin Plan Amendments). Phase I may be extended up to five years at the discretion of the Central Valley Water Board's Executive Officer based on the need to develop Basin Plan Amendments to support implementation of Phase II, reduction in anticipated staff resources, or other factors. Table S-1 depicts the key components of the two pathways to regulatory compliance under the Phase I Salt Control Program. The Board retains its discretion to adjust the established requirements on a case-by-case basis. However, because the Board finds that implementation of the Salt Control Program is best achieved through implementation of the Alternative Salinity Permitting Approach, application of such discretion will be limited under the Conservative Salinity Permitting Approach.

Under Phase I of the Salt Control Program, permitted dischargers of salinity (permittees) will be subject to the Conservative Salinity Permitting Approach unless the permittee elects to be permitted under the Alternative Salinity Permitting Approach.

Permittees may switch from one approach to another by submitting a written request to the Executive Officer of the Central Valley Water Board to change its selected compliance pathway. This request must include documentation regarding how the permittee will comply with the requirements applicable to the compliance pathway it is now requesting to be permitted under and the basis for the change. If the permittee requests to change from the Alternative to the Conservative Permitting Approach, the permittee must demonstrate to the Board that it has complied with all provisions associated with the Alternative Compliance Permitting Approach, including financial support to the P&O study, up through the time of permit revision to incorporate requirements for the Conservative Permitting Approach. If the permittee requests to change from the Conservative Permitting Approach to the Alternative Approach, the permittee shall meet the financial commitment requirements of the Alternative Approach as required by the entity conducting the P&O Study.

Prior to implementation of Phase II, the Central Valley Water Board must review the Salt Control Program and adopt compliance pathways for Phase II. The compliance pathways for Phase II may be similar or different from those in Phase I. Permittees will have an opportunity to review and select Phase II compliance pathways upon implementation of Phase II. The process shall repeat itself prior to implementation of Phase III.

TABLE S-1: COMPARISON BETWEEN THE CONSERVATIVE AND ALTERNATIVE SALINITY PERMITTING APPROACHES DURING PHASE I

Conservative Salinity Permitting Approach	Alternative Salinity Permitting Approach
<u>All Permittees</u> • Apply conservative assumptions for interpretation of the narrative objectives and application of numeric water quality objectives to protect AGR and MUN beneficial uses • Limited availability of a compliance or time schedule to meet a salinity-related effluent limit or waste discharge requirement (subject to the discretion of the Central Valley Water Board) <u>Groundwater Discharge and Non-NPDES Discharge Permittees</u> • Limited new or expanded allocation of assimilative capacity subject to the discretion of the Central Valley Water Board • Does not meet eligibility requirements for an exception <u>NPDES Surface Water Discharge Permittees</u> • A new or expanded allocation of assimilative capacity may be authorized only where a permittee can demonstrate that the impact of the new discharge or the increased discharge will be spatially localized or temporally limited, a determination subject to the discretion of the Central Valley Water Board Does not meet eligibility requirements for a variance	<u>All Permittees</u> • Participate in the Phase I Prioritization and Optimization Study throughout its duration • Continue implementing reasonable, feasible and practicable efforts to control salinity through performance-based measures as determined by the Central Valley Water Board, including: - Salinity management practices - Pollution prevention, watershed, and/or salt reduction plans - Monitoring - Maintenance of existing discharge concentration or loading levels of salinity <u>Groundwater and Non-NPDES Discharges</u> • Salinity limits not used as a compliance metric except to ensure implementation of performance-based measures; • Permittees that meet requirements of the alternative salinity permitting approach are considered in compliance with their salinity limits <u>NPDES Surface Water Discharges</u> • Eligible for a salinity variance

Phase I Conservative Salinity Permitting Approach

The Conservative Salinity Permitting Approach applies to all permitted dischargers, unless the permittee elects to participate in the Phase I Alternative Salinity Permitting Approach. Under the Conservative Salinity Permitting Approach, the Central Valley Water Board shall develop permit conditions based on the requirements established below.

Groundwater and Non-NPDES Surface Water Discharges

The Central Valley Water Board shall apply the following principles to permits being issued to regulate discharges of salt to groundwater or discharges of salt to surface waters that are not subject to NPDES permits (Chapter 5.5 of the Porter-Cologne Water Quality Control Act which contains state statutory requirements for issuing NPDES permits consistent with the federal Clean Water Act).

1. *Permit Provisions* – Permit limitations shall be set as follows:

    (a) Surface Water – Limitations shall be set based on the applicable water quality objective that protects the most sensitive beneficial use and based on the application of the Antidegradation Policy. The Central Valley Water Board may use its discretion to continue to authorize a previously approved mixing zone for salinity subject to the provisions in paragraph (4).

(b) Groundwater – Limitations will be set based on the applicable water quality objective that protects the most sensitive beneficial use and based on the application of the Antidegradation Policy. The Central Valley Water Board may use its discretion to continue to authorize previously allocated use of assimilative capacity in groundwater subject to the provisions in paragraph (4).

2. *Application of Applicable Water Quality Objectives* – When the most salinity sensitive beneficial use is AGR or MUN, the Central Valley Water Board will apply the associated narrative and range in numeric objectives as indicated below. When the applicable water quality objective for setting Permit Limitations is a site-specific numeric water quality objective, the Board shall apply that numeric objective. The values recommended below apply only for the conservative approach and are limited to use under Phase 1.

   (a) AGR Beneficial Use Protection – When it applies the narrative water quality objective, the Central Valley Water Board shall use a conservative, numeric value for electrical conductivity (EC) to protect the AGR beneficial use. During Phase I of the Salt Control Program, the numeric value of 700 µS/cm EC (as a monthly average) shall be considered to be a conservative value that is protective of the AGR beneficial use. This value is for use only as indicated here for the Conservative Permitting Approach and shall not be considered a water quality objective. For discharges where a site-specific numeric value has been developed and/or previously applied to the discharge for the protection of the AGR beneficial use, the Board shall continue to apply that value, as appropriate.

   (b) MUN Beneficial Use – When it applies a Secondary Maximum Contaminant Level (SMCL) for protection of a MUN beneficial use, the Central Valley Water Board shall use the recommended SMCL of 900 µS/cm EC (as an annual average).

3. *Consideration of Degradation to High Quality Waters* – Before authorizing degradation to high quality waters, and consistent with the state and federal antidegradation policies as applicable, the Central Valley Water Board must consider, among other things, if allowing the degradation is to the maximum benefit to the people of the state. Under the Phase I Conservative Permitting Approach, the Board must specifically find that allowing this permittee to degrade a high quality water better serves the people of the state rather than their participation in the P&O study for Phase I of the Salt Control Program.

4. *Allocation of Assimilative Capacity* – For both surface and groundwater discharges, the Central Valley Water Board will limit new or expanded allocations of salinity related assimilative capacity. If a permittee has previously received an allocation of assimilative capacity, and the allocation was granted with the support of an antidegradation study or analysis, then the Board may consider continuing the previously approved allocation of assimilative capacity.

5. *Salinity Exception* - Permittees operating under the Phase I Conservative Salinity Permitting Approach do not meet eligibility requirements for a salinity exception.

6. *Issuance of Time Schedules* – The Central Valley Water Board will limit use of time schedules for achieving compliance with salinity permit limitations and will use its discretion to limit the time allowed in the event that a time schedule is deemed necessary under the particular circumstances associated with that discharge.

NPDES Surface Water Discharges

The Central Valley Water Board shall apply the following principles to permits being issued to regulate discharges of salinity to surface waters that are subject to NPDES permit provisions as required by the federal Clean Water Act.

1. *Permit Provisions* – Permit limitations, if required, shall be set as follows:

   Limitations shall be set based on the applicable water quality objective that protects the most sensitive beneficial use and based on the application of the Antidegradation Policy. The Central Valley Water Board may use its discretion to continue to authorize a previously-approved mixing zone for salinity subject to the provisions in paragraph (4).

2. *Application of Applicable Water Quality Objectives* – When the most salinity sensitive beneficial use is AGR or MUN, the Central Valley Water Board will apply the associated narrative and range in numeric objectives as indicated below. When the applicable water quality objective for setting Permit Limitations is a site-specific numeric water quality objective, the Board shall apply that numeric objective. The values recommended below apply only for the conservative approach and are limited to use under Phase 1.

   (a) AGR Beneficial Use Protection – When it applies the narrative water quality objective, the Central Valley Water Board shall use a conservative, numeric value for electrical conductivity (EC) to protect the AGR beneficial use. During Phase I of the Salt Control Program, the numeric value of 700 µS/cm EC (as a monthly average) shall be considered to be a conservative value that is protective of the AGR beneficial use. This value is for use only as indicated here for the Conservative Permitting Approach and shall not be considered a water quality objective. For discharges where a site-specific numeric value has been developed and/or previously applied to the discharge for the protection of the AGR beneficial use, the Board shall continue to apply that value, as appropriate.

   (b) MUN Beneficial Use – When it applies a Secondary Maximum Contaminant Level (SMCL) for protection of a MUN beneficial use, the Central Valley Water Board shall use the recommended SMCL of 900 µS/cm EC (as an annual average).

3. *Consideration of Degradation to High Quality Waters* – Before authorizing degradation to high quality waters, and consistent with the state and federal antidegradation policies as applicable, the Central Valley Water Board must consider, among other things, if allowing the degradation is to the maximum benefit to the people of the state. Under the Phase I Conservative Permitting Approach, the Board must specifically find that allowing this permittee to degrade a high quality water better serves the people of the state rather than their participation in the P&O study for Phase I of the Salt Control Program.

4. *Allocation of Assimilative Capacity (i.e., mixing zone/dilution credit)* – The Central Valley Water Board will limit new or expanded allocations of assimilative capacity in surface water (i.e., mixing zone/dilution credit) and will consider whether a permittee can demonstrate that the reduction of water quality will be spatially localized or temporally limited with respect to the waterbody. The Board may consider maintaining any previously approved allocations of assimilative capacity, if the previously approved allocation was granted with the support of an antidegradation study or analysis.

5. *Salinity Variance* – Permittees operating under the Phase I Conservative Salinity Permitting Approach do not meet eligibility requirements for a salinity variance.

6. *Compliance Schedule* – Where a reasonable potential finding has been made and the permittee is unable to comply with the applicable salinity effluent limit, the Central Valley Water Board will use its discretion to limit the use of compliance schedules authorized by the State Water Board Compliance Schedule Policy for achieving compliance with salinity-based effluent limits, and will use its discretion to limit the time allowed in the event that a compliance schedule is deemed necessary under the particular circumstances associated with the discharge.

Phase I Alternative Salinity Permitting Approach

In lieu of being subject to the Conservative Permitting Approach, permittees may elect to be permitted for discharges of salinity by participating in the Phase I Alternative Salinity Permitting Approach. Permittees electing to participate in the Phase I Alternative Salinity Permitting Approach are given the opportunity to participate collectively in the P&O Study with other permittees, the Central Valley Water Board, and other stakeholders, including those importing and benefitting from water supplies from the Central Valley, to work toward full implementation of the Salt Control Program. Key milestones for the P&O Study are identified in Table S-2 and outlined in Figure S-2.

If the P&O Study does not meet the milestones established in Table S-2 or where the Central Valley Water Board finds reasonable progress is not being made towards achieving the milestones, the Board will notify the permittees that selected the Alternative Salinity Permitting Approach of its findings through public notice that includes a required schedule for completion of the P&O Study milestones. Failure to comply with the requirements in the notice will result in all permittees that elected to be permitted under the Phase I Alternative Salinity Permitting Approach to become subject to the requirements of the Conservative Salinity Permitting Approach.

The Central Valley Water Board shall develop salinity-related permit conditions based on the requirements established below. Permitted salinity discharges shall be implemented in a manner consistent with state and federal antidegradation policies (State Water Board Resolution No. 68-16 and 40 CFR §131.12), as applicable. Discharges of salt to waste management units subject to the containment requirements of Division 2 of Title 27 of the California Code of Regulations are not eligible to be permitted under the Alternative Salinity Permitting Approach.

TABLE S-2: KEY PHASE I PRIORITIZATION AND OPTIMIZATION STUDY MILESTONES

Implementation Schedule	Milestone/ Deliverable	Minimum Requirements
6 months from Notice to Comply	Phase I Workplan	*Workplan to include*: • Detailed P&O Study task descriptions • Cost estimate for each task • Task completion schedule • Stakeholder participation elements
Within 12 months from Notice to Comply	Phase I Funding & Governance Plan	*Complete Phase I implementation planning:* • Establish the entity and procedures for governance of the P&O Study • Develop funding plan to complete the P&O Study
Per Workplan	Special Studies	*Special Studies to include*: • Groundwater Quality Trace Constituent Study • Recycled Water Imports Study • Stormwater Recharge Master Plan Study • Emerging Technical Updates (every 5 years)
12 months from Workplan approval and annually there after	Annual Progress Report	*Annual Report to summarize*: • Progress on Workplan execution • Status of Phase I funding and expenditures • Stakeholder participation
5 years from Notice to Comply	Interim Project Report	*By Central Valley Hydrologic Region, identify*: • Recommended preferred physical projects with recommended next steps for development • Recommended non-physical projects and a schedule for implementation
9 years from Notice to Comply	Long-term Governance Plan for Phases II and III	*Governance Plan that establishes*: • Describes planned implementation approach for Phases II & III • Governance structure including: - Stakeholder roles and responsibilities - Committees responsible for development of policies, technical documents, BMPs and funding
	Long-term Funding Plan for Phases II and III	*Funding Plan that establishes*: • Financial approach for long-term funding including sources and funding types (grants, bonds, loans, etc.) • Approach for the equitable management and funding of long-term, large-scale salinity management projects
	Basin Plan Amendment Recommendations	*As needed, recommended amendments to Basin Plans to:* • Facilitate implementation of Phase II of the Salt Control Program • Consider extension of salinity variance and revision of salinity exception policies • As appropriate, modify the Salinity Permitting Approaches;
10 years from Notice to Comply	Final Phase I Project Report	• *For preferred physical projects*: - Conceptual designs - Assessment of environmental permitting requirements • Status of implementation of non-physical projects per Interim Project Report with recommendations for modifications, as needed

Groundwater and Non-NPDES Surface Water Discharges

The Central Valley Water Board shall apply the following principles to permits being issued for regulating discharges of salt to groundwater or discharges of salt to surface waters that are not subject to NPDES permits (Chapter 5.5 of the Porter-Cologne Water Quality Control Act which contains state statutory requirements for issuing NPDES permits consistent with the federal Clean Water Act).

1. *Participation in P&O Study* - Permittees electing the Alternative Salinity Permitting Approach shall be required to participate in efforts related to conducting the P&O Study, including providing the minimum required level of financial support. The level of participation may vary based on salinity in the discharge, local conditions or other factors. The needed level of participation would be established by the lead entity (i.e., Central Valley Salinity Coalition [CVSC]) that is overseeing the P&O Study. The lead entity shall document and confirm full participation by the permittee(s) until the P&O Study is completed or until such time that the Central Valley Water Board otherwise revises the applicable waste discharge requirements and/or conditional waiver or determines permittee is in compliance with the requirements of the Phase 1 Conservative Salinity Permitting Approach. The timeframe for completion of the P&O Study is expected to be ten years from the effective date of this Salt Control Program but may be extended by the Central Valley Water Board's Executive Officer for a period of up to five years.

2. *Implementation of Reasonable, Feasible and Practicable Efforts to Control Salt* - The Central Valley Water Board will require dischargers to continue to implement reasonable, feasible and practicable efforts to control levels of salt in discharges. Such efforts may include, but are not limited to, implementation of management practices that are designed to reduce salt in discharges; implementation of pollution prevention plans, watershed plans, and/or salt reduction plans that help to reduce salt loads in discharges to groundwater or surface water; and, monitoring for salt in surface water or groundwater as part of existing local, watershed-based or regional monitoring programs, in coordination with monitoring under the SNMP.

3. *Maintain Current Discharge Concentrations for Salt or Mass Loading Levels* - To the extent reasonable, feasible and practicable (and while accounting for conservation and drought, salinity levels in the water supply source, and some appropriate increment of growth), the Central Valley Water Board may use its discretion to adopt performance-based limits or action levels to the extent the Board finds it appropriate and necessary for salinity for permittees electing the Alternative Salinity Permitting Approach.

4. *Setting Permit Requirements* - In regulating discharges of salt in waste discharge requirements and conditional waivers, the Board shall require dischargers to fully participate in the P&O study (as documented by the lead entity overseeing the study), implement reasonable, feasible and practicable efforts to control salt, and meet any performance-based limits or action levels deemed appropriate and necessary by the Central Valley Water Board. Compliance with these requirements shall constitute compliance with the water quality control plan and shall be deemed adequately protective of beneficial uses and the water quality objectives reasonably required for that purpose consistent with this salt control program.

NPDES Surface Water Discharges

The Central Valley Water Board shall apply the following principles to permits being issued for authorizing discharges of salt to surface waters subject to NPDES permits under the federal Clean Water Act.

1. *Participation in P&O Study* - Permittees electing the Alternative Salinity Permitting Approach shall be required to fully participate in efforts related to conducting the P&O Study including providing at least the minimum required level of financial support determined by the lead entity. The level of participation may vary based on salinity in the discharge, local conditions or other factors. The needed level of participation would be established by the lead entity (i.e., CVSC) that is overseeing the P&O Study. The lead entity shall document and confirm adequate participation by the permittee(s) until the P&O Study is completed or until such time that the Central Valley Water Board otherwise revises the applicable NPDES permit consistent with this Control Program. The timeframe for completion of the P&O Study is expected to be ten years from the effective date of this Salt Control Program but may be extended by the Board's Executive Officer for a period of up to five years.
2. *Requirements for Ensuring Reasonable Protection of Beneficial Uses* - Full participation in the P&O study as documented and confirmed by the lead entity overseeing the P&O Study shall be found by the Central Valley Water Board to provide for in lieu or alternative compliance to receiving water limits or effluent limits based on salinity. To determine reasonable potential, the Board maintains its discretion to conduct such analysis by using the approach set forth in U.S. EPA's Technical Support Document, by using the approach set forth in the SIP, or by using another approach that is consistent with applicable federal regulations. To the extent that the discharge in question is found to have reasonable potential for causing or contributing to a violation of an applicable salinity water quality objective pursuant to applicable federal regulations, the Board may consider granting use of assimilative capacity by allowing for a mixing zone and dilution credits. The permittee is also eligible for consideration of receiving a salinity variance pursuant to the Salinity Variance Policy.
3. *Implementation of Reasonable, Feasible, and Practicable Efforts to Control Salt* - The Central Valley Water Board will continue to require implementation of reasonable, feasible and practicable efforts to control levels of salt in discharges. Such efforts may include, but are not limited to, implementation of management practices that are designed to reduce salt in discharges; implementation of pollution prevention plans, watershed plans, and/or salt reduction plans that help to reduce salt loads in discharges to surface waters; and, continued monitoring for salt in surface water as part of existing local, watershed-based or regional monitoring programs, in coordination with monitoring under the Salt and Nitrate Control Program.
4. *Maintain Current Discharge Concentrations for Salt or Mass Loading Levels* - To the extent reasonable, feasible and practicable (and while accounting for conservation and drought, salt levels in the water supply source, and some appropriate increment of growth), the Central Valley Water Board may use its discretion to prescribe performance-based limits or triggers to the extent the Board finds such additional actions appropriate and necessary for salinity for permittees electing the Alternative Salinity Permitting Approach.

Permitted Discharge to a Water Body Subject to De-designation of a Beneficial Use

The P&O Study will establish a program for the long-term management of salts in the Central Valley, including identifying locations that may serve as salt management area. For example, a

groundwater basin that has had one or more beneficial uses de-designated due to salinity may be a considered a potential location for establishment of a salt management area. Accordingly, under the Phase I Salt Control Program:

- Permittee(s) that selects either the Conservative or Alternative Permitting Approach and then requests the de-designation of one or more beneficial uses from a surface water body or all or part of a groundwater basin based on salinity shall participate in the P&O Study even after the beneficial use de-designation is approved by providing at least the minimum level of required financial support throughout the Phase I program. The P&O Study shall evaluate all areas de-designated based on salinity for suitability as salt management areas.
- Permittee(s) that discharges to a surface water body or a groundwater basin where one or more beneficial uses were de-designated due to salinity prior to the beginning of Phase I of the Salt Control Program shall participate in the P&O Study by providing at least the minimum level of required financial support.

Process to Initiate Phase I of the Salt Control Program

This section establishes the process and schedule for initiation of Phase I of the Salt Control Program and for selection of a compliance pathway during Phase I. For permittees that select the Alternative Salinity Permitting Approach, nothing here prevents, or should be interpreted to prevent, permittees from implementing elements of the Phase I P&O Study prior to receiving a Notice to Comply.

Existing Discharges of Salt

The Central Valley Water Board shall issue a Notice to Comply with the Salt Control Program to existing permittees that discharge salt in the Central Valley Region within one year of the effective date of the Basin Plan Amendments. Upon receipt of the Notice to Comply, permittees receiving the notice will be subject to the Conditional Prohibition of Salinity Discharges (Section ##), which establishes enforceable requirements for implementation of Phase I of the Salt Control Program.

No later than six months after receiving the Notice to Comply, existing permittees shall notify the Central Valley Water Board of its decision of whether to be permitted under the Conservative Salinity Permitting Approach or the Alternative Salinity Permitting Approach. Based on the selection of the permitting approach, the permittee shall comply with the following requirements:

- *Conservative Salinity Permitting Approach* – A permittee that selects this approach must submit an assessment of how the discharge will comply with the conservative permitting requirements set forth in the Conservative Salinity Permitting Approach. The permittee shall submit this assessment to the Central Valley Water Board with the notification to the Board of its permit compliance pathway decision. If the Board does not concur with the findings of the assessment, the Board may request additional technical and/or monitoring information with a deadline for submittal. When conducting the assessment, the permittee may use historical water quality information if the information adequately represents the character of the current discharger and/or receiving water and is approved by the Board's Executive Officer.
- *Alternative Salinity Permitting Approach* – A permittee that selects this approach shall participate in the Phase I P&O Study by providing at least the minimum required level of financial support throughout Phase I as determined by the lead entity overseeing the P&O

Study. The permittee shall provide documentation of its compliance with the required level of support with the notification to the Central Valley Water Board of its permitting decision. If the permittee has an approved salinity-related Time Schedule Order, Compliance Schedule or variance that expires prior to the completion of the Phase I P&O Study, the Board, at its discretion, may extend the Time Schedule Order or Compliance Schedule or renew or grant a variance, as appropriate and allowed by other applicable policies.

New or Substantively Modified Discharges

A new permittee, or existing permittee seeking a permit modification due to a substantial and/or material change which increases salt concentration or load from a facility, shall indicate how the permittee intends to comply with the Salt Control Program at the time of application and provide the required information to support the decision, as described above.

Failure to Comply

Any permittee that does not submit a response to the Notice to Comply within the required six-month period may be subject to an enforcement action. Permittees who do not respond in the required six-month period are subject to enforcement for failure to respond to the Notice to Comply but may still select the Alternative Salinity Permitting Approach. Permittees selecting the Alternative Salinity Permitting Approach after the originally allocated six-month period will need to obtain approval from the lead entity conducting the P&O Study to join late and will be subject to the lead entity's requirements in addition to providing the minimum required level of financial support.

A permittee that elects to participate in the Alternative Salinity Permitting Approach must continue to provide at least the minimum required level of financial support to the lead entity for the P&O Study throughout the duration of Phase I of the Salt Control Program, unless the Central Valley Water Board has revised the permittee's permit in a manner that authorizes them to be subject to the Conservative Permitting Approach. In such cases, the permittee must remain in compliance with the Alternative Salinity Permitting Approach until such time that their permit is amended to allow compliance under the Conservative Permitting Approach. Where a permittee fails to provide the minimum required level of financial support to the P&O Study, the Board may require the permittee to comply with the requirements of the Conservative Salinity Permitting Approach.

Salt Control Program - Phase I to Phase II Re-Evaluation

Upon completion of Phase I and prior to initiation of Phase II of the Salt Control Program, the Central Valley Water Board will re-evaluate the Conservative and Alternative Salinity Permitting Approaches applicable under Phase I of the Salt Control Program. The Regional Water Board shall consider convening a stakeholder group to assist in the re-evaluation. In this re-evaluation, the Regional Water Board shall consider the findings of the P&O Study, results from surveillance and monitoring programs, proposals for use of other permitting options or approaches, and progress made towards meeting the overarching goals of the Salt Control Program. Based on the findings of this re-evaluation, the Regional Water Board may modify or re-adopt the Phase I permitting approaches and policies (e.g., variance and exceptions), thereby making them applicable to Phase II. Such amendments must be completed prior to the initiation of Phase II of the Salt Control Program.

Prior to the initiation of Phase II of the Salt Control Program, the Central Valley Water Board will notify all existing permittees in the Central Valley Region of the salinity-related permitting

approaches applicable to Phase II. This notification must occur even if the Phase I permitting approaches are re-adopted. The purpose of the notification is to provide the opportunity for permittees to change the compliance pathway selected for Phase I. A permittee that elects to change its compliance pathway shall submit documentation to support the change within 180 days of the Board's notification.

A similar notification process will be utilized prior to the initiation of Phase III of the Salt Control Program.

Figure S-2: General Schedule of Key Phase I Prioritization and Optimization Study Activities and Milestones

Category	Year of Implementation (From Notice to Comply)									
	1	2	3	4	5	6	7	8	9	10
Stakeholder Coordination	Stakeholder Coordination Meetings (as needed frequency)									
	SGMA GSA Coordination Meetings (as needed frequency)									
Phase I Workplan	Phase I Work-plan									
Governance	Phase I Governance Plan	Long-term Governance Plan for Phases II & III								
Funding	Phase I Funding Plan	Long-term Funding Plan for Phases II & III								
Preferred Physical/Non-Physical Salt Management Projects		Development of Recommended Preferred Physical and Non-Physical Projects			Interim Project Report					
						Conceptual Design and Assessment of Environmental Permitting Requirements for Preferred Physical Projects				Final Project Report
Special Studies				Groundwater Quality Trace Constituent Study						
						Recycled Water Imports Study				
								Stormwater Recharge Master Plan Study		
					Emerging Tech Update No. 1				Emerging Tech Update No. 2	
Basin Planning									Phase II Recommendations	
Reports		Progress Reports at Key Milestones (Years 1; 5; and 10 with documentation (electronic or otherwise) of participation)								

Edits Specific to the Tulare Lake Basin Plan Salinity Limits (Revision)

The following paragraphs include proposed modifications to the Tulare Lake Basin Plan in the sections indicated below.

CHAPTER 3 WATER QUALITY OBJECTIVES

Modify the Basin Plan in Chapter 3 Water Quality Objectives under the heading “Salinity” (page III-8 and III-9), as follows:

No proven means exist at present that will allow ongoing human activity in the Basin and maintain ground water salinity at current levels throughout the Basin. ~~Accordingly, the water quality objectives for ground water salinity control the rate of increase.~~

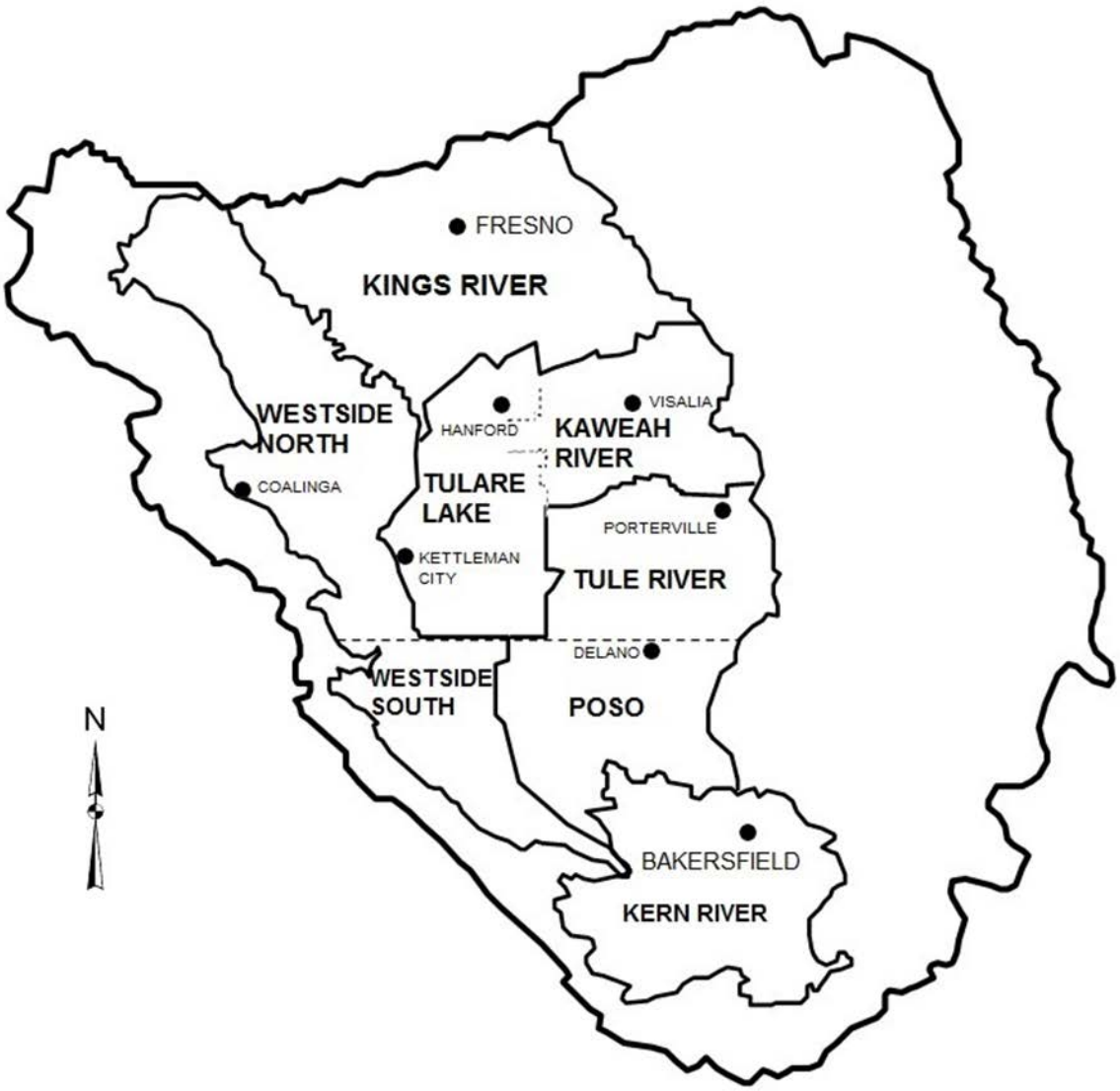
~~The maximum average annual increase in salinity measured as electrical conductivity shall not exceed the values specified in Table III-4 for each hydrographic unit shown on Figure III-1. The average annual increase in electrical conductivity will be determined from monitoring data by calculation of a cumulative average annual increase over a 5- year period.~~

~~**TABLE III-4**~~
~~**TULARE LAKE BASIN**~~
~~**GROUND WATER QUALITY OBJECTIVES FOR SALINITY**~~

~~Hydrographic Unit~~	~~Maximum Average Annual Increase in Electrical Conductivity (µmhos/cm)~~
~~Westside (North and South)~~	~~1~~
~~Kings River~~	~~4~~
~~Tulare Lake and Kaweah River~~	~~3~~
~~Tule River and Poso~~	~~6~~
~~Kern River~~	~~5~~

~~FIGURE III-1~~

~~TULARE LAKE BASIN~~
~~GROUND WATER HYDROGRAPHIC UNITS~~



CHAPTER 4 IMPLEMENTATION

Modify the Basin Plan in Chapter 4 Implementation under the heading "Irrigated Agriculture" (page IV-3), as follows:

Agricultural drainage may be discharged to surface waters provided it does not exceed ~~1,000 µmhos/cm EC, 175 mg/l chloride, nor 1 mg/l~~ *an applicable water quality objective for* boron. Other requirements also apply. An exception from ~~the EC and/or the chloride~~*boron* limit*s* for agricultural drainage discharged to surface waters may be permitted consistent with the Program for Exception from Implementation of Water Quality Objectives for ~~Salinity~~*boron*.

Modify the Basin Plan in Chapter 4 Implementation under the heading "Discharges to Navigable Waters" (page IV-10), as follows:

- ~~The maximum electrical conductivity (EC) of a discharge shall not exceed the quality of the source water plus 500 micromhos per centimeter (µmhos/cm) or 1,000 µmhos/cm, whichever is more stringent. When the water is from more than one source, the EC shall be a weighted average of all sources.~~

- Discharges shall not exceed ~~an EC of 1,000 µmhos/cm, a chloride content of 175 mg/l, or~~ *an applicable water quality objective for* boron ~~content of 1.0 mg/l~~.

- A~~n exception~~*variance* from ~~the EC and/or the chloride~~*boron* limitations ~~identified here~~ may be granted for municipal and domestic wastewater discharges to navigable waters if a variance is granted pursuant to the Variance Policy for Surface Water.

Modify the Basin Plan in Chapter 4 Implementation under the heading "Discharges to Land" (page IV-11), as follows:

Additional effluent limits follow…

- The incremental increase in salts from use and treatment must be controlled to the extent ~~possible~~*that it is reasonable, feasible and practicable*. ~~In most circumstances, the maximum EC shall not exceed the EC of the source water plus 500 µmhos/cm. When the source water is from more than one source, the EC shall be a weighted average of all sources. However, under certain circumstances, the Regional Board, upon request of the discharger, may adopt an effluent limit for EC that allows EC in the effluent to exceed the source water by more than 500 µmhos/cm. This request will be granted consistent with the Policy for Exception from Implementation of Water Quality Objectives for Salinity.~~

- Discharges to areas that may recharge to good quality ground waters shall not exceed ~~an EC of 1,000 µmhos/cm, a chloride content of 175 mg/l, or~~ *an applicable boron* ~~*content of 1.0 mg/l*~~*water quality objective*.

- An exception from ~~the EC and/or the chloride~~*boron* limit*s* for discharges to land may be permitted consistent with the Program for Exception from Implementation of Water Quality Objectives ~~for Salinity~~.

Modify the Basin Plan in Chapter 4 Implementation under the heading “Industrial Wastewater” (page IV-13 and IV-14), as follows:

Generally, the effluent limits established for municipal waste discharges will apply to industrial wastes. Industrial dischargers shall be required to…

(1) Comply with water quality objectives established in Chapter 3.

(2) Comply with Chapter 15 for discharges of designated or hazardous waste unless the discharger demonstrates that site conditions and/or treatment and disposal methods enable the discharge to comply with this Basin Plan and otherwise qualify for exemption from Chapter 15.

(3) Comply with effluent limitations set forth in 40 CFR 400 when discharge is to surface water.

(4) Comply with, or justify a departure from, effluent limitations set forth in 40 CFR 400 if discharge is to land.

~~(5) Limit the increase in EC of a point source discharge to surface water or land to a maximum of 500 µmhos/cm. A lower limit may be required to assure compliance with water quality objectives.~~

~~An exception from the EC limit may also be permitted consistent with the Program for Exception from Implementation of Water Quality Objectives for Salinity.~~

Modify the Basin Plan in Chapter 4 Implementation under the heading “Oil Field Wastewater” (page IV-15), as follows:
Policies regarding the disposal of oil field wastewater are…

- *Discharges of oil field wastewater to unlined sumps, stream channels, or surface waters shall be regulated consistent with applicable laws, regulations and policies requiring the protection of beneficial uses in surface water and groundwater and the need to prevent nuisance conditions. Limits for the White Wolf subarea are discussed in the “Discharges to Land” subsection of the “Municipal and Domestic Wastewater” section.*

- ~~Maximum salinity limits for wastewaters in unlined sumps overlying ground water with existing and future probable beneficial uses are 1,000 µmhos/cm EC, 200 mg/l chlorides, and 1 mg/l boron, except in the White Wolf subarea where more or less restrictive limits apply. The limits for the White Wolf subarea are discussed in the “Discharges to Land” subsection of the “Municipal and Domestic Wastewater” section.~~

- ~~Discharges of oil field wastewater that exceed the above maximum salinity limits may be permitted to unlined sumps, stream channels, or surface waters if the discharger successfully demonstrates to the Regional Water Board in a public hearing that the proposed discharge will not substantially affect water quality nor cause a violation of water quality objectives~~

- ~~Maximum salinity limits~~*~~boron~~* ~~*limit*~~ ~~for wastewaters in unlined sumps overlying ground water with existing and future probable beneficial uses are 1,000 umhos/cm EC, 200 mg/l chlorides, and~~ *~~is~~* ~~1 mg/l boron, except in the White Wolf subarea where more or less restrictive limits apply. The limits for the White Wolf subarea are discussed in the "Discharges to Land" subsection of the "Municipal and Domestic Wastewater" section.~~
- ~~Discharges of oil field wastewater that exceed the above maximum salinity limits may be permitted to unlined sumps, stream channels, or surface waters if the discharger successfully demonstrates to the Regional Water Board in a public hearing that the proposed discharge will not substantially affect water quality nor cause a violation of water quality objectives.~~An exception from ~~the EC and/or the chloride~~*boron* limit*s* may be permitted consistent with the Program for Exception from Implementation of Water Quality Objectives for ~~*Salinityb*~~*Boron*.

Program to Control and Permit Nitrate Discharges to Groundwater

The Nitrate Control Program is a program for the control and permitting of nitrate discharges to groundwater in the Sacramento-San Joaquin River Basins and in the Tulare Lake Basin and applies to all groundwater basins that are designated with the municipal and domestic supply (MUN) beneficial use.[9]

This amendment was adopted by the Central Valley Water Board on 31 May 2018, and approved by the State Water Resources Control Board on X _____ 2018. The Effective Date of the Nitrate Control Program shall be X _____ 2018, the date of Office of Administrative Law approval.

Program Overview

Based on the CV-SALTS SNMP and its supporting studies, several groundwater basins and sub-basins in the Central Valley currently exceed the water quality objective for nitrate, which is set at the primary maximum contaminant level of 10 mg/L-N for drinking water. In addition, the SNMP and supporting studies identified that the cost for treating groundwater that exceeds 10 mg/L-N to be in the range of $36 to $81 billion, and in some scenarios would take more than 70 years for groundwater to meet the standard. Based on this and other information, the SNMP identified the need for a Nitrate Control Program that includes the following management goals:

Goal 1 – Ensure a Safe Drinking Water Supply;
Goal 2 – Achieve Balanced Salt and Nitrate Loadings; and,
Goal 3 – Implement Managed Aquifer Restoration where reasonable, feasible and practicable.

The timeframe for meeting these three goals is largely unknown and will vary from basin to basin. Further, the SNMP recognized that it may not be reasonable, feasible or practicable to achieve balanced loadings or fully restore groundwater in some basins/sub-basins. For other basins, it may take multiple decades to achieve the goals of the Nitrate Control Program. In some limited cases, where restoration of the groundwater basin for MUN uses may not be reasonable, feasible or practicable it may be necessary for the Central Valley Water Board to consider de-designating the MUN beneficial use designations from that groundwater basin.

The Nitrate Control Program is prioritized to first address health risks associated with drinking water that exceeds the nitrate primary maximum contaminant level (i.e., nitrate drinking water standard). Priority Groundwater Basins/Sub-basins[10] have been identified based on ambient nitrate conditions, and timelines have been established for implementation of the Nitrate Control Program in these prioritized basins and sub-basins. Implementation of the Nitrate Control Program in non-prioritized basins and sub-basins will occur as directed by the Central Valley Water Board's Executive Officer. In areas of the Central Valley where there are no identified groundwater basins or sub-basins, the Nitrate Control Program will apply when the Central

[9] The implementation provisions in this Nitrate Control Program apply to discharges of nitrate to groundwater. To extent that the Central Valley Water Board uses other forms of nitrogen speciation (e.g., total Nitrogen and nitrite+nitrate) to address nitrate discharges, this Control Program would also apply in those circumstances.

[10] The prioritized Groundwater Basins/Sub-basins identified in the public draft, including identification per DWR's Bulletin 118, are from Luhdorff and Scalmanini Consulting Engineers and Larry Walker Associates (2016a), and the Central Valley Water Board may adjust these priorities during the public review process.

Valley Water Board's Executive Officer determines it is necessary and appropriate to address nitrate discharges to localized groundwater.

Permittees within the prioritized basins and sub-basins that have received notice must generally assess nitrate levels in groundwater used for MUN that may be impacted by nitrate discharge(s). The assessment, using readily available data and information, must determine if the groundwater in question is a safe, reliable source of drinking water with respect to nitrates. If the groundwater is impacted, and if the permittee is causing an exceedance of nitrate in the groundwater in public water supply or domestic wells beyond the primary maximum contaminant level, then the permittee shall submit an Early Action Plan (EAP) that includes specific actions and a schedule of implementation to address the immediate needs of those drinking groundwater from public water supply or domestic wells that exceed the primary maximum contaminant level for nitrate.

For longer-term implementation of the Nitrate Control Program, the Central Valley Water Board's permitting actions specific to nitrate discharges to groundwater will fall within one of the two following approaches:

- Individual Approach (Path A) is the approach utilized when an individual permittee (or third party group subject to a General Order wishing to proceed under Path A) decides to comply with the nitrate requirements as an individual/third party, or in circumstances when a management zone is not an available option.

- Management Zone Approach (Path B) is the approach utilized when multiple permittees elect to participate in a management zone as the preferred method for complying with the Nitrate Control Program.

Path A is considered the default permitting approach while Path B is an optional approach. Where appropriate, the Central Valley Water Board will encourage permittees to work cooperatively with each other and other stakeholders to implement the Nitrate Control Program through a Management Zone

The Nitrate Control Program provides the Central Valley Water Board with flexibility and authority to permit discharges of nitrate to groundwater using Alternative Compliance mechanisms rather than traditional permitting determinations. The Board's options for Alternative Compliance include: (1) determining availability of assimilative capacity on a volume-weighted average basis for a management zone; (2) granting a conditional exception for meeting nitrate water quality objectives in discharges and/or in groundwater; and, (3) offsets. To authorize Alternative Compliance through one of these options, the Board must approve an Alternative Compliance Project as part of the authorization. A fundamental element of any Alternative Compliance Project is that it must ensure that groundwater users impacted by discharges of nitrates have access to drinking water that meets state and federal drinking water standards, and must provide specific milestones and timelines for meeting all three management goals of the program. In circumstances where it is not reasonable, feasible or practicable to meet management goal 2 and/or goal 3, permittees must still indicate how discharges of nitrate will be controlled to the extent that is reasonable, practicable and feasible.

The Nitrate Control Program protects high quality groundwater by establishing nitrate triggers. Nitrate triggers are not water quality objectives themselves. The Central Valley Water Board may authorize a discharge, or collective discharges in a Management Zone, to exceed a nitrate

trigger level, but to do so the Board must approve an Alternative Compliance Project, except in limited and unique circumstances.

Geographic Areas of Application

Considering the extent and size of the Central Valley Water Board's jurisdictional boundaries, it is necessary to categorize and prioritize the region's groundwater basins/sub-basins based on currently known ambient water quality conditions (where information is available), location (e.g., valley floor versus foothill and mountainous areas), and areas that are not part of an identified basin/sub-basin.

Priority Basins and Sub-basins

Basins/sub-basins have been prioritized and within Priority 1 and 2 have been identified as having the most serious ambient water quality concerns for nitrate. Priority 1 and 2 Groundwater Basins/Sub-basins are identified in Table N-1 and are depicted in Figure N-1.

Non-Prioritized Basins/Sub-basins

Groundwater Basins/Sub-basins that are not currently prioritized are identified in Appendix X. These basins/sub-basins or areas with the basins/sub-basins may be designated by the Central Valley Water Board as a high priority on a case-by-case basis when determined necessary by the Board.

Areas Within Central Valley Water Board's *Jurisdictional Boundary That Are Not Part of a Basin/Sub-basin*

Due to geologic conditions, some areas within the Central Valley Water Board's jurisdictional area are not part of an identified groundwater basin/sub-basin. These areas tend to be outside of the valley floor, and nitrate concerns in drinking water are generally not an issue of concern.

Figure N-1: PRIORITIZED DWR BULLETIN 118 GROUNDWATER BASINS/SUB-BASINS

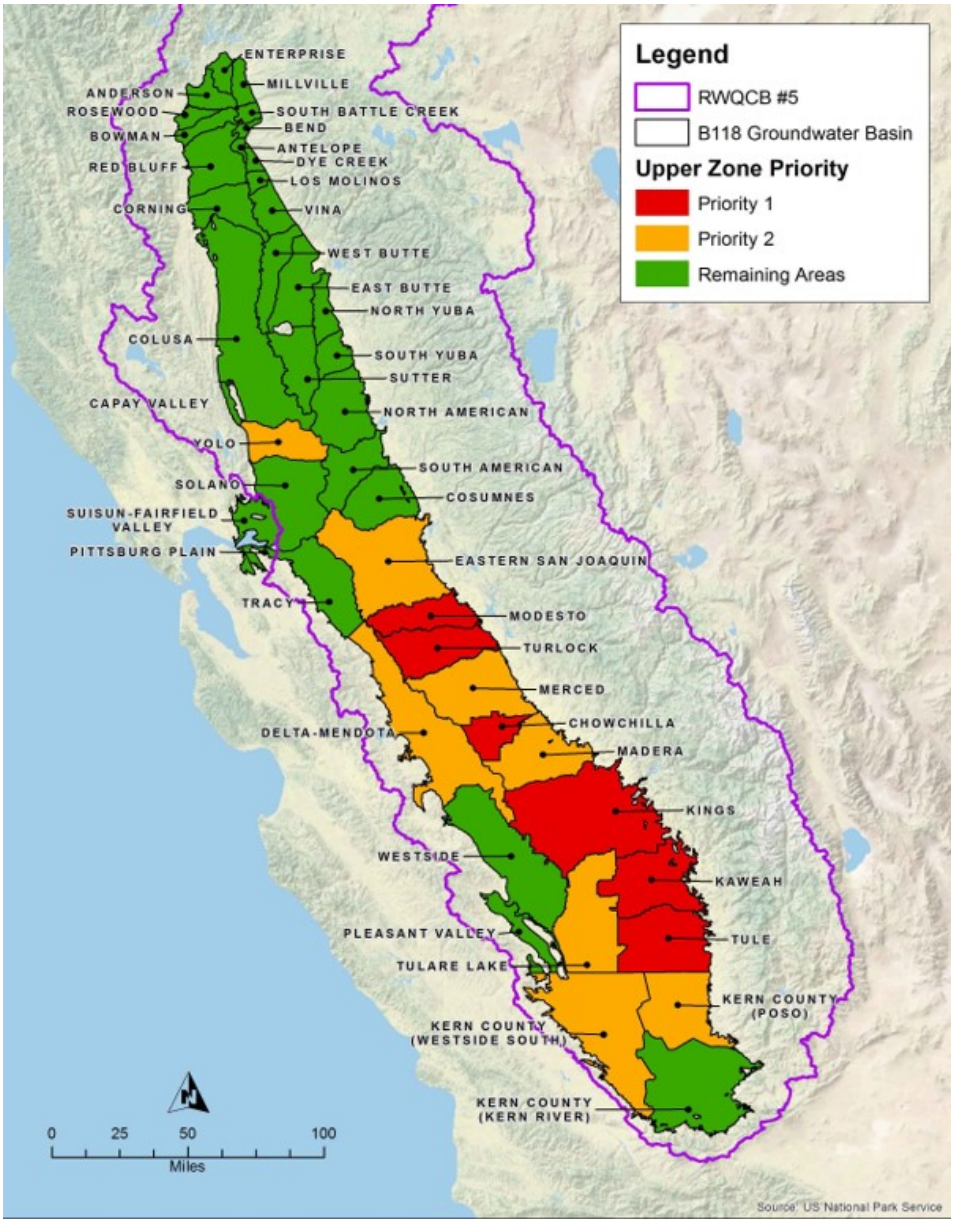


TABLE N-1: PRIORITIZED DWR BULLETIN 118 GROUNDWATER BASINS/SUB-BASINS

PRIORITY 1		PRIORITY 2	
5-22.11	Kaweah	5-21.67	Yolo
5-22.03	Turlock	5-22.04	Merced
5-22.05	Chowchilla	5-22.14	Kern County (Westside South)
5-22.13	Tule	5-22.12	Tulare Lake
5-22.02	Modesto	5-22.14	Kern County (Poso)
5-22.08	Kings	5.22-07	Delta Mendota
		5-22.01	Eastern San Joaquin
		5-22.06	Madera

Central Valley Water Board Review of Priorities

No later than January 1, 2024, the Central Valley Water Board shall review the priorities listed in Table N-1, and may adjust these priorities after considering water quality-based factors, and other relevant information. Factors the Board may consider in its review include, but are not limited to, the following:

(1) Degree to which areas (or subareas) with known nitrate drinking water supply contamination will be addressed under the current prioritization;
(2) Additional data/information provided by permittee(s) and/or other stakeholders within a basin/sub-basin (or subarea) that demonstrates that the nitrate concerns have or have not been addressed or will be addressed via another program or activity;
(3) Degree to which the area identified by water quality factors actually has impacted drinking water users (i.e., drinking water is predominately a surface water supply or drinking water supplies are primarily groundwater);
(4) Changes in groundwater basin/sub-basin boundaries by the Department of Water Resources, which may affect the spatial order as presented in Table N-1; and
(5) Maximization of efficient use of resources, which may affect the number of basins/sub-basins (or subareas) that may be included on the prioritized schedule of implementation.

Issuance of Notices to Comply

Existing Permitted Dischargers[11]

The Nitrate Control Program establishes timelines for implementation based on the priority designation of the groundwater basin/sub-basin, or lack of location within a groundwater basin/sub-basin. Implementation of the Nitrate Control Program for existing permitted dischargers occurs when notification is received from the Central Valley Water Board through the issuance of Notices to Comply. The Board will issue Notices to Comply according to the schedule in Table N-2. The Executive Officer of the Central Valley Water Board retains discretion to adjust the timelines in Table N-2 based on available resources.

New or Expanding Dischargers

After the effective date of the Nitrate Control Program, new dischargers located in groundwater basin/sub-basin (regardless of priority) or those with a material change to their operation that increases the level of nitrate discharged to groundwater must comply with the Nitrate Control Program and provide data and information as applicable. This provision does not apply to dischargers located in areas that are not part of a designated basin/sub-basin unless the Executive Officer of the Central Valley Water Board determines, based on the specific facts of the discharge, that it should be subject to the Nitrate Control Program and the Board's Executive Officer notifies the discharger accordingly.

[11] For the purposes of the Nitrate Control Program, the term "existing permitted dischargers" means dischargers subject to individual Waste Discharge Requirements, dischargers regulated as individual facilities under General Waste Discharge Requirements (e.g., facilities regulated under the Waste Discharge Requirements General Order for Existing Milk Cow Dairies), facilities or discharges subject to Conditional Waivers, or dischargers subject to General Waste Discharge Requirements that are regulated through a Third Party (e.g., dischargers regulated under Irrigated Lands Regulatory Program's Third-Party General Orders). For those dischargers that are part of a third party group, notifications required by the Nitrate Control Program may be issued to and received from the Third Party group on behalf of their members, who in turn will be responsible for notifying its members.

Table N-2. Timeline for Issuance of Notice to Comply with Nitrate Control Program

Basin Priority	Time for Issuance of Notice to Comply
Priority 1 Basins	As soon as is reasonably feasible after the effective date of the Nitrate Control Program, but no later than 1 year from xxxx (effective date).
Priority 2 Basins	Within 2 to 4 years after effective date of the Nitrate Control Program.
Basins/sub-basins not Prioritized	Based on available resources, and as determined necessary by the Executive Officer of the Central Valley Water Board.
Areas that are Not Part of a Basin	As determined necessary by the Executive Officer of the Central Valley Water Board.

Community Request

Nothing in the Nitrate Control Program is intended to prevent or prohibit a community from specifically requesting that the Central Valley Water Board subject a basin, sub-basin, or portion thereof to the Nitrate Control Program in advance of the timelines identified here. Upon such a request, the Central Valley Water Board will consider the same factors evaluated during initial prioritization utilizing any additional information provided and will consider whether the request appropriately enhances ongoing efforts to address nitrate contamination on a region-wide scale.

Permittees Requesting Deferral for a Sub-basin or Portion of a Sub-basin

Permittees may request that, for a sub-basin or a portion of a sub-basin, the Central Valley Water Board defer the issuance of Notices to Comply so that the notices for that sub-basin or portion of a sub-basin are issued along with the notices issued for a lower priority basin. Such a request must be accompanied by documentation related to the factors considered during the original prioritization. The request may be provided at any time up to six months prior to the scheduled issuance of a Notice to Comply as outlined in the section titled *Implementation of Permitting Approache*s.

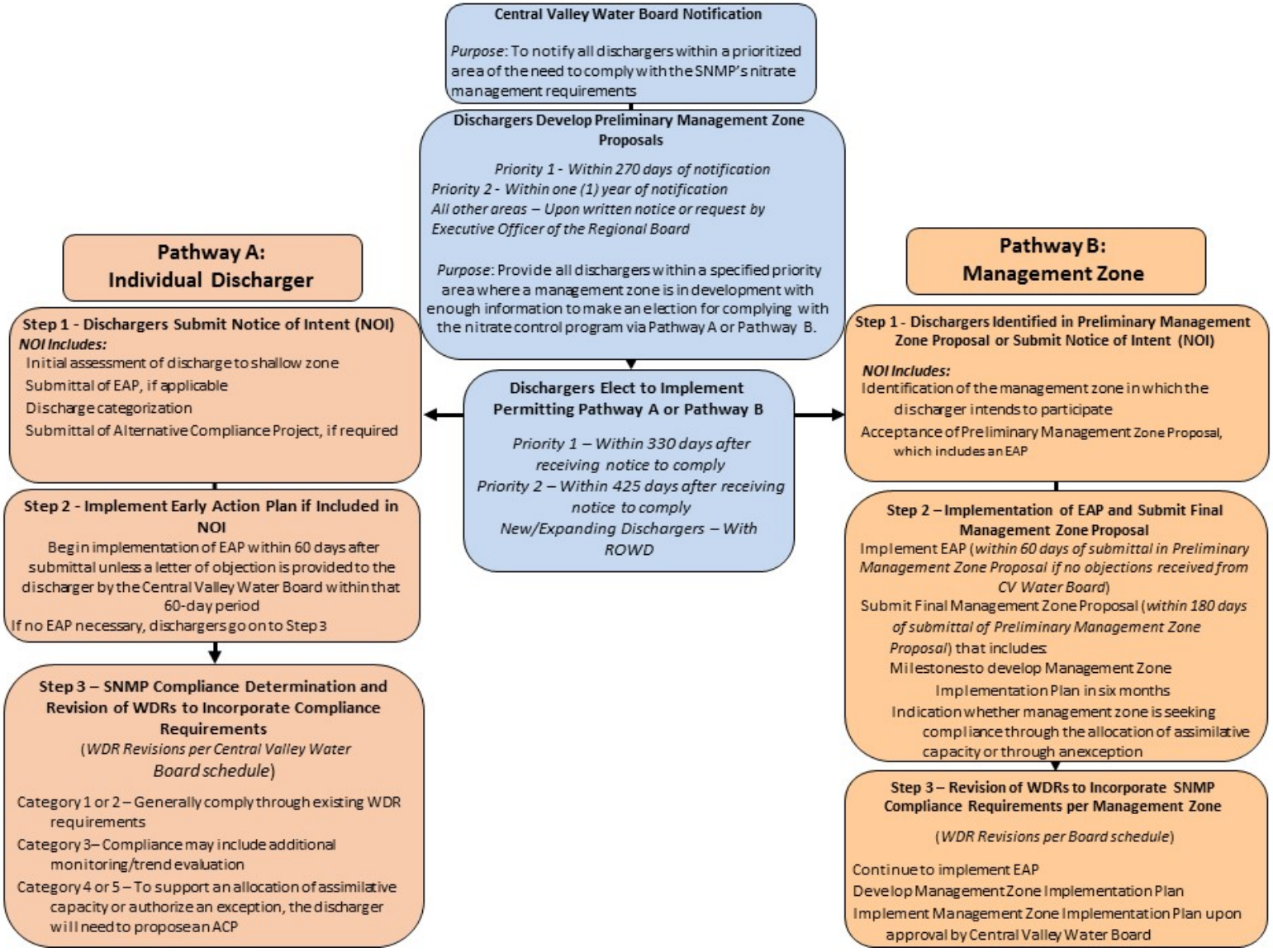
Permitting Approaches

Long-term implementation of the Nitrate Control Program will occur through updates of existing waste discharge requirements or conditional waivers, or through the issuance of new waste discharge requirements or conditional waivers for new sources of nitrate. Permit actions must fall under one of the two following approaches (Figure N-2):

(1) Individual Permitting Approach (Path A): Individual requirements (or per a General Order); or,

(2) Management Zone Approach (Path B): Participation in a Management Zone.

FIGURE N-2. NITRATE PERMITTING STRATEGY



Path A –Individual Permitting Approach

Path A applies to all permitted dischargers unless the discharger affirmatively elects to participate in the Management Zone Approach under Path B. For Path A, nitrate discharge impacts to groundwater are assessed in shallow groundwater underlying the area of discharge, otherwise referred to as the "Shallow Zone." What constitutes the Shallow Zone in any given area may vary but the purpose is to represent the area of the aquifer available for use by the shallowest domestic wells. To determine ambient nitrate concentrations in the Shallow Zone for purposes of the Nitrate Control Program only, several options are available:

(1) Use readily available data and information to calculate ambient nitrate concentrations for the shallowest ten percent (10%) of the domestic water supply wells in the Upper Zone[12] of a groundwater basin/sub-basin as defined and established in *Region 5: Updated Groundwater Quality Analysis and High Resolution Mapping for Central Valley Salt and Nitrate Management Plan* (June 2016);

(2) Conduct a site (or area) specific evaluation based on various types of available data and information, including but not limited to, depth and age of domestic wells in the area of contribution, groundwater table, well completion report data, and other available and relevant information; or,

(3) An equivalent alternative approved by the Central Valley Water Board's Executive Officer.

Based on the impact of the discharge to the Shallow Zone and the quality of the discharge, nitrate discharges will be characterized and placed into one of five categories (see Table N-3). Central Valley Water Board determinations regarding availability and allocation of assimilative capacity will be based on ambient water conditions in the Shallow Zone.

To protect high quality groundwater throughout the Central Valley, a nitrate trigger level of 75% of the water quality objective for nitrate is established. The trigger level is not a water quality objective. Permitted discharges that cause or may cause nitrate in the Shallow Zone to exceed a nitrate trigger may be subject to development and implementation of an Alternative Compliance Project.

[12] Upper Zone is defined to mean, "the portion of groundwater basin, sub-basin or management zone from which most domestic wells draw water. The Upper Zone generally extends from the top of the saturated zone to the depth to which domestic wells are generally constructed (screened). The lower boundary of the upper zone varies based on well construction information for a given basin or sub-basin. The Corcoran Clay layer may define the lower boundary of the upper zone or the lower zone, pending the available well construction and groundwater use information."

TABLE N-3: NITRATE DISCHARGE CATEGORIES

Category	Discharge Quality and Impact to Groundwater
Category 1 No Degradation	Discharge quality, as it reaches the Shallow Zone[13], is better than the applicable water quality objective and is better than the average nitrate concentration in the Shallow Zone.
Category 2 *De Minimis* Impacts	The average nitrate concentration in the Shallow Zone is better than the applicable water quality objective, and, over a 20-year planning horizon: • The effect of the discharge on the average nitrate concentration in the Shallow Zone is expected to use less than 10% of the available assimilative capacity in the Shallow Zone; and • The discharge, in combination with other nitrate inputs to the Shallow Zone, is not expected to cause average nitrate concentrations in the Shallow Zone to exceed a nitrate trigger of 75% of the applicable water quality objective.
Category 3 Degradation Below Trigger	The average nitrate concentration in the Shallow Zone is better than the applicable water quality objective. Estimated that discharge is more than *de minimis*, but will not cause the average nitrate concentration in the Shallow Zone to exceed a trigger of 75% of the applicable water quality objective over a 20-year planning horizon.
Category 4 Degradation Above Trigger	The average nitrate concentration in the Shallow Zone is better than the water quality objective. Though the discharge is reasonably expected to cause the average nitrate concentration in the Shallow Zone to exceed a trigger of 75% of the applicable water quality objective over a 20-year planning horizon, the average nitrate concentration in the Shallow Zone is expected to remain at or below the applicable water quality objective over the same 20-year planning horizon.
Category 5 Discharge Above Objective	Either: • The average nitrate concentration in the Shallow Zone is better than the applicable water quality objective, but the discharge may cause the average nitrate concentration in the Shallow Zone to exceed the water quality objective over a 20-year planning horizon; or, • The average nitrate concentration in the Shallow Zone exceeds the applicable water quality objective and the discharge quality, as it reaches the Shallow Zone, also exceeds the applicable water quality objective.

[13] For the purposes of this Table, the "Shallow Zone" is the portion of the aquifer whose areal extent is defined by the boundaries of the discharge area and whose vertical extent is defined by the depth of the shallowest 10% of the domestic water supply wells near the discharge or an equivalent alternative.

Path B –Management Zone Approach

Permittees with nitrate discharges may elect to comply with the Nitrate Control Program by participating in a Management Zone. The Central Valley Water Board finds Management Zones to be a regulatory option that is both appropriate and preferable for many areas of the Central Valley, because the use of Management Zones can maximize resources to address the varying degrees of nitrate concentrations found in groundwater basins/sub-basins, and can provide a more integrated approach to developing local solutions for localized areas of contaminated groundwater. Management Zones are a type of "Alternative Compliance Project" and are subject to Alternative Compliance Project requirements. Table N-4 summarizes the characteristics, intent and purposes of a Management Zone.

Individual nitrate discharges from permittees participating in a Management Zone are not categorized like discharges in Path A. Rather, impacts to groundwater are assessed collectively in the upper zone, which is defined to mean, "the portion of groundwater basin, sub-basin or management zone from which most domestic wells draw water. It generally extends from the top of the saturated zone to the depth to which domestic wells are generally constructed (screened). The lower boundary of the upper zone varies based on well construction information for a given basin or sub-basin. The Corcoran Clay layer may define the lower boundary of the upper zone or the lower zone, pending the available well construction and groundwater use information."

For a Management Zone, Central Valley Water Board determinations of availability and allocation of assimilative capacity are based on a volume-weighted average of nitrate concentrations in the Upper Zone.

Implementation of Permitting Approaches

Due Dates for Deliverables

To implement the Permitting Approaches set forth in this control program, permittees need to provide the Central Valley Water Board with information regarding their discharge of nitrate. Deadlines for submitting this information varies based on the priority of the basin/sub-basin, and the permitting approach selected. Table N-5.A and Table N-5.B identify the various deliverables based on which permitting approach a discharger seeks to follow, and associated due dates for these deliverables.

TABLE N-4: CHARACTERISTICS, INTENT AND PURPOSE OF A MANAGEMENT ZONE

Characteristics

- A defined area which incorporates a portion of a large groundwater basin(s)/sub-basin(s)
- Encompasses all groundwater for those permittees that discharge nitrate to said groundwater that have selected to comply with the Nitrate Control Program through participation in the defined Management Zone.
- Voluntarily proposed by those regulated permittees located within the proposed Management Zone boundary that have decided to work collectively and collaboratively to comply with the Nitrate Control Program.

Intent and Purposes

- Defined area that serves as a discrete regulatory compliance unit for complying with the Nitrate Control Program for multiple permittees.
- Basis for the establishment of local management plans to manage nitrate within the Management Zone's boundary.
- Participants work collectively to implement SNMP management goals: (1) safe drinking water, (2) achieving balance, and (3) restoring groundwater basins/sub-basins (where reasonable, feasible and practicable) across the Management Zone.
- Where groundwater within the Management Zone boundary, and groundwater impacted by those permittees within the Management Zone boundary, is being used as a drinking water supply, and where those drinking water supplies are impacted by nitrates and exceed or are likely to exceed nitrate drinking water standards in the foreseeable future, Management Zone participants will ensure the provision of safe drinking water to all residents in the area adversely affected by those dischargers of nitrates from those that are participating in the Management Zone.
- Ensure the provision of safe drinking water for the Management Zone through stakeholder coordination and cooperation.
- Work towards better resource management through appropriate allocation of resources.
- Central Valley Water Board imposes reasonable provisions collectively for the Management Zone, and its permittee participants, that recognize the need to prioritize nitrate management activities over time for compliance with the Nitrate Control Program and the SNMP's Management Goals.

TABLE N-5.A: PATHWAY A, SUMMARY SCHEDULE FOR IMPLEMENTATION

Deliverable	Application	Due Dates[A]	
Initial Assessment/Notice of Intent	All existing and new permittees electing Pathway A.	Existing Permittees - Priority 1 Basins/Sub-basins	330 days after receiving Notice to Comply
		Existing Permittees - Priority 2 Basins/Sub-basins & Non-Prioritized Basins	425 days after receiving Notice to Comply
		New or Expanding Permittees	With Report of Waste Discharge
Early Action Plan	Required if permittee is causing any public water supply or domestic well to exceed nitrate water quality objective.	To be submitted with Notice of Intent and initiated within 60-days if no objection received by the Central Valley Water Board	
Alternative Compliance Project if needed	Required for Category 4 and Category 5 Permittees	To be submitted with Notice of Intent	

A. The Executive Officer of the Central Valley Water Board retains the discretion to extend the due dates identified here for submittal of identified deliverables if proper justification is provided to the Executive Officer at least 30 days prior to required date for submittal.

TABLE N-5.B: PATHWAY B, SUMMARY SCHEDULE FOR IMPLEMENTATION

Deliverable	Application	Due Dates[A]	
Notice of Intent	All existing and new Permittees electing Pathway B.	Existing Permittees - Priority 1 Basins/Sub-basins	330 days after receiving Notice to Comply
		Existing Permittees - Priority 2 Basins/Sub-basins & Non-Prioritized Basins	425 days after receiving Notice to Comply
		New or Expanding Permittees	With Report of Waste Discharge
Preliminary Management Zone Proposal	Permittees electing Path B that are actively participating in development of Preliminary Management Zone Proposal.	Existing Permittees - Priority 1 Basins/Sub-basins	270 days after receiving Notice to Comply
		Existing Permittees - Priority 2 Basins/Sub-basins & Non-Prioritized Basins	1 year after receiving Notice to Comply
		New or Expanding Permittees	With Report of Waste Discharge
Early Action Plan	Required element of Preliminary Management Zone Proposal for public water supply and domestic wells within the Management Zone area that exceed nitrate water quality objective.	To be submitted with Preliminary Management Zone Proposal and initiated within 60-days if no objection received by the Central Valley Water Board	
Alternative Compliance Project if needed	Equivalent to Management Zone Implementation Plan noted below		
Final Management Zone Proposal		180 days after receiving comments from Central Valley Water Board on Preliminary Management Zone Proposal	
Management Zone Implementation Plan		Six (6) months after the Final Management Zone Proposal is accepted by the Executive Officer of the Central Valley Water Board.	

A. The Executive Officer of the Central Valley Water Board retains the discretion to extend the due dates identified here for submittal of identified deliverables if proper justification is provided to the Executive Officer at least 30 days prior to required date for submittal.

Deliverables

Initial Assessment/Notice of Intent (Path A)

Permittees, or those seeking a permit to discharge that includes the discharge of nitrate, must prepare an Initial Assessment and Notice of Intent, unless the permittee is actively engaged in developing a Management Zone proposal and is identified as an initial participant in a Preliminary Management Zone Proposal submitted pursuant to Path B.

Existing Permittees

Upon receipt of a Notice to Comply, existing permittees shall conduct an initial assessment of their discharge as it relates to nitrate. The initial assessment shall be submitted as part of a Notice of Intent and must include the following unless as otherwise approved by the Central Valley Water Board's Executive Officer:

(i.) Estimated impact of discharge of nitrate on the Shallow Zone over a 20-year planning horizon;
- May be estimated based on a simple mass balance calculation assuming 20 years of loading as nitrate reaches the water table.

(ii.) Initial assessment of water quality conditions based on readily available existing data and information.
- May use default information in or referenced by, the Central Valley SNMP (2016) or provide supplemental information that includes water quality conditions in the shallow and upper zones;[14]

(iii.) Survey of the discharge, and determination if the discharge is causing any public water supply or domestic well to be contaminated by nitrate;

(iv.) If causing contamination of a public water supply or domestic well, an Early Action Plan; Identification/summary of current treatment and control efforts, or management practices;[15]

(v.) Identification of any overlying or adjacent Management Zone;

(vi.) Identification of Category of the Discharge, and information to support the categorization;[16]

(vii.) Information necessary to support request for allocation of assimilative capacity, if applicable;

(viii.) For category 4 dischargers, identification of an Alternative Compliance Project or justification as to why the Central Valley Water Board should not require implementation of an Alternative Compliance Project.

[14] Dischargers may rely on previous groundwater assessments conducted by the discharger, assessments conducted by others that are applicable and relevant, or previous antidegradation analysis that have been submitted to the Central Valley Water Board.

[15] If the discharger seeking compliance through this option is a third party submitting the NOI on behalf of the individual members of the third party, the third party will need to take reasonable efforts to summarize the management practices being used by its members with respect to protecting groundwater quality from the impacts of nitrates from member farming operations.

[16] If the discharger seeking compliance through this option is a third party submitting the NOI on behalf of the individual members of the third party, the third party will need to take reasonable efforts to categorize the various geographic areas as covered by the third party general order.

(ix.) For category 5 dischargers, information as required to support an Application for an Exception pursuant to the Exceptions Policy, which would include identification of an Alternative Compliance Project.

Previous groundwater assessments conducted by the discharger (or third party group on behalf of collective dischargers), and/or antidegradation analyses that have been submitted and approved by the Central Valley Water Board's Executive Officer may satisfy all or part of initial assessment requirement.

Recycled Water Permittees

Permittees for recycled water that meets the requirements of Title 22 of the California Code of Regulations may substitute the information requested above with the same information that is otherwise required for a Recycled Water Application under State Water Resources Control Board Order No. 2014-0090-DWQ, General Waste Discharge Requirements for Recycled Water Use.

New Dischargers, or Existing Permitted Dischargers Proposing Material Changes to their Regulated Discharge

New dischargers that propose to discharge new or additional levels of nitrate[13], or existing dischargers seeking a permit modification due to a material change to a facility that requires submittal of a Report of Waste Discharge and that includes an increase in nitrate discharges (either in volume or concentration), shall include the initial assessment information at the time of submittal of the Report of Waste Discharge. If a Management Zone exists for the area where the new or expanded discharge shall occur, the discharger shall indicate how the discharger intends to comply with the Nitrate Control Program, i.e., Path A or Path B. If a Management Zone does not exist at the time of application, the Central Valley Water Board may use its discretion to issue a time schedule to the discharger for complying with the Nitrate Control Program through a later formed Management Zone.

Option In lieu of Individual Initial Assessment/Notice of Intent

In lieu of conducting an initial assessment and submitting a Notice of Intent, existing permitted dischargers may work collaboratively and cooperatively to prepare a Preliminary Management Zone Proposal that meets the requirements specified under Path B.

Preliminary Management Zone Proposal (Path B)

Existing permitted dischargers may work cooperatively to prepare a single Preliminary Management Zone Proposal for an identified geographic area. A Preliminary Management Zone Proposal must include all of the following unless otherwise approved by the Central Valley Water Board's Executive Officer:

(i.) Proposed preliminary boundaries of the Management Zone area;
(ii.) Identification of Initial Participants/Dischargers;
(iii.) Identification of other dischargers and stakeholders in the management zone area that the initiating group is in contact with regarding participation in the management zone;

[13]In cases where there is an ownership transfer of a facility and where the level of nitrate being discharged does not change, an initial assessment may not be necessary.

(iv.) Initial assessment of groundwater conditions based on readily available existing data and information.
- May use default information in or referenced by, the Central Valley SNMP or provide supplemental information that includes water quality conditions in the upper zone;

(v.) Identification/summary of current treatment and control efforts, or management practices;[14]

(vi.) Initial identification of public water supplies or domestic wells within the Management Zone area with nitrate concentrations exceeding the water quality objective;

(vii.) An Early Action Plan to address drinking water needs for those that rely on public water supply or domestic wells with nitrate levels exceeding the water quality objective;

(viii.) Documentation of process utilized to identify affected residents and the outreach utilized to ensure that they are given the opportunity to participate in development of an Early Action Plan;

(ix.) Identification of areas within or adjacent to the management zone that overlap with other management areas/activities;

(x.) Any constituents of concern that the individual discharger/group of dischargers intend to address besides nitrate (not required but is an option available);

(xi.) Proposed timeline for:
- Identifying additional participants;
- Further defining boundary areas;
- Developing proposed governance and funding structure for administration of the Management Zone;
- Additional evaluation of groundwater conditions across the management zone boundary area, if necessary; and,
- Preparing and submitting a Final Management Zone Proposal and a Management Zone Implementation Plan.

Preliminary Management Zone Proposals must be submitted to the Central Valley Water Board according to the due dates identified in Table N-5.

Permittees that are identified as an Initial Participant in a Management Zone shall be presumed to be electing Path B for complying with the Nitrate Control Program, unless they otherwise notify the Central Valley Water Board of their intent to withdrawal from Path B. If a permittee withdraws from Path B, the permittee must submit an initial assessment and Notice of Intent within 30 days from withdrawing from Path B.

Early Action Plan (Path A and Path B as applicable)

Early Action Plans are required if public water supply or domestic wells in the area of contribution exceed the water quality objective for nitrate. Implementation of an Early Action Plan that is addressing elevated nitrate concentrations in public water supply and/or domestic wells by providing an alternative water supply does not create a presumption of liability for the cause of the elevated concentrations.

[14] If the discharger seeking compliance through this option is a third party submitting the NOI on behalf of the individual members of the third party, the third party will need to take reasonable efforts to summarize the management practices being used by its members with respect to protecting groundwater quality from the impacts of nitrates from member farming operations.

An Early Action Plan must include the following, unless otherwise approved by the Central Valley Water Board's Executive Officer:

(i.) A process to identify affected residents and the outreach utilized to ensure that impacted groundwater users are informed of and given the opportunity to participate in the development of proposed solutions;

(ii.) A process for coordinating with others that are not dischargers to address drinking water issues, which must include consideration of coordinating with affected communities, domestic well users and their representatives, the State Water Board's Division of Drinking Water, Local Planning Departments, Local County Health Officials, Sustainable Groundwater Management Agencies and others as appropriate;

(iii.) Specific actions and a schedule of implementation that is as short as practicable to address the immediate drinking water needs of those initially identified within the management zone, or area of contribution for a Path A discharger, that are drinking groundwater that exceeds nitrate standards and that do not otherwise have interim replacement water that meets drinking water standards; and

(iv.) A funding mechanism for implementing the Early Action Plan, which may include seeking funding from Management Zone participants, and/or local, state and federal funds that are available for such purposes;

An Early Action Plan may be part of an Alternative Compliance Project.

Final Management Zone Proposal (Path B)

Management Zone participants must prepare and submit a Final Management Zone Proposal. The Final Management Zone Proposal must include all information from the Preliminary Management Zone Proposal, updated as necessary, as well as the following:

(i.) Timeline for development of the Management Zone Implementation Plan;
(ii.) Updated list of participants;
(iii.) Governance structure that, at a minimum, establishes the following: (a) roles and responsibilities of all participants; (b) identification of funding or cost-share agreements to implement short term nitrate management projects/activities, which may include local, state and federal funds that are available for such purposes; and (c) a mechanism to resolve disputes among participating dischargers;
(iv.) Additional evaluation of groundwater conditions across management zone area, if necessary;
(v.) Identification of proposed approach for regulatory compliance (i.e., use of assimilative capacity and/or seeking approval of an exception for meeting nitrate water quality objectives);
(vi.) Explanation of how the management zone intends to interact and/or coordinate with other similar efforts such as those underway pursuant to the SGMA; and,
(vii.) Documentation of actions taken to implement the Early Action Plan.

Final Management Zone Proposals shall be submitted to the Central Valley Water Board for review and comment according to the due dates identified in Table N-5B.

Management Zone Implementation Plan (Path B)

A Management Zone Implementation Plan is the equivalent of an Alternative Compliance Project. Management Zone Implementation Plans shall:

(i.) Identify how emergency, interim and permanent drinking water needs for those affected by nitrates in the Management Zone area are being addressed, and how a drinking water supply that ultimately meets drinking water standards will be available to all drinking water users within the Management Zone boundary, and the timeline and milestones necessary for addressing such drinking water needs;

(ii.) Show how the Management Zone plans to achieve balanced nitrate loadings within the management zone (to the extent reasonable, feasible and practicable);

(iii.) Include a plan for establishing a managed aquifer restoration program to restore nitrate levels to concentrations at or below the water quality objectives to the extent it is reasonable, feasible and practicable to do so;

(iv.) Document collaboration with the community and/or users benefitting from any proposed short/long-term activities to provide safe drinking water;

(v.) Identify funding or cost-share agreements, or a process for developing such funding or cost-share agreements, to implement intermediate and long-term nitrate management projects/activities, which may include identification of local, state and federal funds that are available for such purposes;

(vi.) Identify nitrate management activities within a Management Zone which may be prioritized based on factors identified in the Central Valley SNMP (2016) and the results of the characterization of nitrate conditions. Prioritization provides the basis for allocating resources with resources directed to the highest water quality priorities first;

(vii.) Include a water quality characterization and identification of nitrate management measures that contains:

- Characterization of nitrate conditions within the proposed management zone, which will be used as the basis for demonstrating how nitrate will be managed within the Management Zone over short and long-term periods to meet the management goals established in the Central Valley Region SNMP.
- Short (≤ 20 years) and long-term (> 20 years) projects and/or planning activities that will be implemented within the Management Zone, and in particular within prioritized areas (if such areas are identified in the Implementation Plan) to make progress towards attaining each of the management goals identified by the Nitrate Control Program. Over time as water quality is managed in prioritized areas, updates to the plan may shift the priorities in the Management Zone.
- Milestones related to achieving balanced nitrate loadings and managed aquifer restoration.
- A short and long-term schedule for implementation of nitrate management activities with interim milestones.
- Identification of triggers for the implementation of alternative procedures or measures to be implemented if the interim milestones are not met.
- A water quality surveillance and monitoring program that is adequate to ensure that the plan when implemented is achieving the expected progress towards attainment of management goals. All or parts of the surveillance and monitoring program may be coordinated or be part of a valley-wide and/or regional groundwater monitoring, if appropriate.
- Consideration of areas outside of the Management Zone that may be impacted by discharges that occur within the Management Zone boundary areas.

(viii.) Identify the responsibilities of each regulated discharger, or groups of regulated dischargers participating in the Management Zone, to manage nitrate within the Zone.
(ix.) Include information necessary for obtaining an Exception as set forth in the Exceptions Policy, or information necessary for the Central Valley Water Board to grant use of assimilative capacity for Management Zones.

Management Zone Request for Allocation of Assimilative Capacity

A request for allocation of assimilative capacity for a Management Zone may not be for an area larger than an identified basin or sub-basin from Table N-2, and must include the following:

(i.) A comprehensive antidegradation analysis, consistent with the State Antidegradation Policy, which includes an evaluation of impacts to down-gradient areas.[17]
(ii.) Demonstration that there is sufficient assimilative capacity to ensure that discharges of nitrate from participants to the Management Zone, including discharges to recharge projects, will not cause the volume-weighted average water quality in the upper zone underlying the management zone to exceed the applicable Basin Plan objective(s);
(iii.) Demonstration that the proposed discharges covered by the management zone will not unreasonably affect present and anticipated beneficial uses in or down-gradient to the Management Zone;
(iv.) Demonstration that the allocation of assimilative capacity, and the resulting net effect on receiving water quality, is consistent with maximum benefit to the people of the State; and
(v.) Demonstration that Best Practicable Treatment or Control will be implemented to ensure that pollution or nuisance will not occur and that any degradation authorized by Central Valley Water Board will be consistent with the maximum benefit to the people of the state.
(vi.) Demonstration that allocation of assimilative capacity to dischargers participating in the Management Zone will not result in groundwater, as a volume-weighted average in the upper zone, to exceed a trigger level of 75% of the nitrate water quality objective over a 20-year timeframe. The Central Valley Water Board retains the discretion to allocate assimilative capacity above this trigger level as long as the Board can find that use of assimilative capacity above the trigger level will not result in pollution or nuisance over the longer term.

<u>Management Zone Request for Exception to Meeting a Nitrate Water Quality Objective</u>

A Management Zone may request an Exception to meeting a Nitrate Water Quality Objective. The request for application of the Exception may apply to all permitted dischargers participating in the Management Zone. The Central Valley Water Board must find that all required components of the Management Zone Implementation Plan, which is equivalent to an Alternate Compliance Project, is complete to consider an Exception. A complete Management Zone Implementation Plan is considered to meet the application requirements for an Exception for nitrate under the Exceptions Policy

<u>Modification to Management Zone Implementation Plan</u>

A Management Zone Implementation Plan shall be reviewed periodically, and may be modified periodically to incorporate changes based on new data or information. Any such modifications

should generally be changes that will benefit water quality or user protection in the management zone. Any modifications to the Management Zone Implementation Plan that impact or change timelines, milestones or deliverables identified in the Implementation Plan must be approved by the Central Valley Water Board.

Central Valley Water Board Actions

Individual Permitting Approach – Path A

The Central Valley Water Board will use the information contained in a submitted Initial Assessment/Notice of Intent or Report of Waste Discharge to determine if the discharge in question complies with the Nitrate Control Program. If the Board finds that the discharge as currently permitted is in compliance with the Nitrate Control Program, then revisions to existing waste discharge requirements or conditional waivers may not be necessary. In such cases, the Board will provide the permittee with a letter stating its finding with respect to the adequacy of existing waste discharge requirements and compliance with the Nitrate Control Program.

If the discharge as permitted, or proposed to be discharged, does not comply with the Nitrate Control Program, or if the Central Valley Water Board needs additional information to make such a determination, the Board may request additional information using its existing authorities.

Based on the categorization of the discharge, the Central Valley Water Board may require the permittee to conduct additional monitoring and/or implement an Alternative Compliance Project as part of permit conditions.

Upon receipt of a completed Initial Assessment/Notice of Intent or Report of Waste Discharge, the Central Valley Water Board shall take all reasonable efforts to revise applicable waste discharge requirements or conditional waivers within one year, as resources allow.

Implementation of an Early Action Plan shall begin as soon as is reasonably feasible, but no later than 60 days after submittal, unless the Central Valley Water Board deems the Early Action Plan to be incomplete. A revised Early Action Plan must be resubmitted and implemented within the time period directed by the Board's Executive Officer.

Management Zone Permitting Approach – Path B

Preliminary Management Zone Proposal

Upon receipt of a Preliminary Management Zone Proposal, the Central Valley Water Board shall prominently post the proposal on its website, circulate the Proposal publicly through its Lyris list-serve and provide individual post card notices (as resources allow) of the Proposal's availability to dischargers within the Management Zone boundary area that are not already identified as Initial Participants. The Board will work with the group of initiating dischargers to help communicate the availability of the Proposal to other dischargers and stakeholders within the Management Zone area. The Preliminary Management Zone Proposal shall be available for public comment for at least 30 days after being posted by the Board.
Early Action Plan

Implementation of the Early Action Plan shall begin as soon as is reasonably feasible, but no later than 60 days after submittal, unless the Central Valley Water Board deems the Early

Action Plan to be incomplete. A revised Early Action Plan must be resubmitted and implemented within the time period directed by the Board's Executive Officer.

Final Management Zone Proposal

Upon receipt of a Final Management Zone Proposal, the Central Valley Water Board shall prominently post the proposal on its website, circulate the Final Proposal publicly through its Lyris list-serve, and make the Final Proposal available for public review and comment for at least 30 days. The Executive Officer of the Board shall determine if the Final Management Zone Proposal meets the minimum requirements set forth under Path B and must determine if the Final Management Zone Proposal is deemed complete. A complete Final Management Zone Proposal functions as an equivalent to a Report of Waste Discharge for all existing permitted dischargers that are participating in the Management Zone.

Management Zone Implementation Plan

Within a reasonable time period, but not longer than six months after finding the proposed Management Zone Implementation Plan is complete or finding that requests for modifications to an approved Management Zone Implementation Plan that would alter timelines, milestones or deliverables are complete, the Central Valley Water Board shall provide public notice, request comment and schedule and hold a public hearing on the Management Zone Implementation Plan and the request for Alternative Compliance (i.e., volume weighted assimilative capacity or exception) embedded within the plan.

When the Central Valley Water Board finds it necessary to revise existing or issue new waste discharge requirements or conditional waivers to implement the Management Zone Implementation Plan, the notice, request for comment and public hearing requirement may be conducted in conjunction with the Board's process for revising or adopting waste discharge requirements or conditional waivers for those permittees participating in the Management Zone.

The Central Valley Water Board may approve all or part of a request for use of assimilative capacity to a Management Zone using a volume-weighted average in the upper zone, if the Board finds all of the following:

(i.) The request is consistent with the State Antidegradation Policy;
(ii.) The request is supported with a comprehensive antidegradation analysis;
(iii.) The request includes a Management Zone Implementation Plan that meets the requirements identified herein;
(iv.) Allocation of assimilative capacity to dischargers participating in the Management Zone will not adversely impact available assimilative capacity in areas outside of the Management Zone; and,
(v.) Allocation of assimilative capacity to dischargers participating in the Management Zone will not result in groundwater, as a volume-weighted average in the upper zone, to exceed a trigger level of 75% of the nitrate water quality objective for MUN over a 20-year timeframe. The Central Valley Water Board retains the discretion to allocate assimilative capacity above this trigger level as long as the Central Valley Water Board can find that use of assimilative capacity above the trigger level will not result in pollution or nuisance over the longer term.

The Central Valley Water Board may grant an exception to meeting nitrate water quality objectives to existing permitted dischargers participating in the Management Zone, if the Board finds all of the following:

(i) The request is consistent with the Exceptions Policy; and,
(ii) The request includes a Management Zone Implementation Plan that meets the requirements identified herein and serves as an Alternative Compliance Project for an exception to be granted.

If a Management Zone Implementation Plan is found to not be complete, and if the permittees of a Management Zone does not revise the Management Zone Implementation Plan in a timely manner that makes it complete for consideration by the Central Valley Water Board, then permittees within that Management Zone must comply with the Nitrate Control Program via Path A as directed by the Board's Executive Officer.

Requirements for Alternative Compliance Projects

The Central Valley Water Board will require a permittee(s) to develop and implement an Alternative Compliance Project to support an allocation of assimilative capacity on a volume-weighted basis, above a trigger level (except in unique or limited circumstances), or to authorize an exception.

- For permittees electing to comply under Path A, the Alternative Compliance Project must be submitted with the Initial Assessment/Notice of Intent.

- For permittees electing to comply under Path B, the Alternative Compliance Project is the Management Zone Implementation Plan.

At a minimum, an Alternative Compliance Project must include the following:

(1) Identification of public water supply and domestic wells that exceed nitrate water quality objectives and that are within the discharge areas zone of contribution;
(2) A schedule, with identified milestones, for addressing those nitrate-related drinking water issues; and,
(3) Identification of steps to be taken to meet the management goals of the Nitrate Control Program, which may be phased in over time[18]

The Central Valley Water Board has developed *Guidelines for Developing Alternative Compliance Projects*, which dischargers should consider in development of an Alternative Compliance Project. The guidelines may be found in the Staff Report to Incorporate a Salt and Nitrate Control Program for the Central Valley (Central Valley Water Board, 2018).

[18] The Central Valley Water Board recognizes that full compliance with management goals 2 and 3 (i.e., reaching balance and managed restoration) may not be reasonable, feasible or practicable in all circumstances. In such cases, the discharger is responsible for providing the Board with all necessary information to show why full compliance with management goals 2 and 3 are not reasonable, feasible or practicable. Dischargers shall still implement actions towards meeting the management goals that are reasonable, feasible and practicable.

Program Review

The Nitrate Control Program will be reviewed on the same schedule as the Salt Control Program with the first review occurring no later than ___(date)___ (15 years after Office of Administrative Law approval).

Conditional Prohibition for Salt and Nitrate Control Program

Salt Control Program

During Phase 1 of the Salt Control Program, a Conditional Prohibition shall apply to all permittees discharging salt pursuant to Board-issued waste discharge requirements and conditional waivers, except those dischargers regulated under the Board's Irrigated Lands Regulatory Program (ILRP). Dischargers regulated under the ILRP will instead be required to comply with the initial phase of the Salt Control Program through an amendment to the ILRP General Orders, which the Central Valley Water Board shall consider within 18 months of the effective date of the Basin Plan Amendment.

For permittees subject to the Conditional Prohibition, the prohibition shall apply from the time of receiving a Notice to Comply until such time that the permittees' existing waste discharge requirements or conditional waivers regulating the discharge of salts are updated or amended to reflect requirements of Phase I of the Salt Control Program, or until such time that the Central Valley Water Board affirmatively notifies the permittee that their permit complies with the Phase I of the Salt Control Program without the need for further update or amendments. Until the discharger receives a Notice to Comply, the relevant waste discharge requirements or conditional waiver provisions governing the discharge of salts, including any applicable compliance schedule, shall remain in force.

Conditional Prohibition on Salt Discharges

Upon receiving a Notice to Comply from the Central Valley Water Board, discharges of salts at concentrations that exceed salinity numeric values identified in the Phase 1 Conservative Permitting Approach of the Salt Control Program are prohibited unless the permittee is implementing the Phase I requirements of the Salt Control Program.

Permittees subject to the Conditional Prohibition must notify the Central Valley Water Board within six months of receiving a Notice to Comply whether they elect to be regulated under the Conservative or Alternative permitting approaches. Dischargers who do not reply to the Notice to Comply will be required to meet the requirements of the Salt Control Program's Conservative permitting approach. The following information must be submitted with the permittee's response to the Central Valley Water Board of its permit compliance pathway decision (i.e. within six months of receiving a Notice to Comply).

(a) Conservative Salinity Permitting Approach

Permittees not selecting the alternative approach must submit an assessment of how their discharge complies with the conservative permitting requirements set forth in the Salt Control Program. If the Central Valley Water Board's Executive Officer does not concur with the findings of the assessment, the Executive Officer may request additional information from the permittee to verify that the permittee will meet those conservative permitting requirements.

(b) Alternative Salinity Permitting Approach

Permittees selecting the alternative salinity permitting approach must submit written documentation from the lead entity for the Salinity Prioritization and Optimization Study (P&O Study) confirming the discharger's full participation in the P&O Study. Status of the P&O Study

must be documented and confirmed through reports to the Central Valley Water Board from the lead entity. Dischargers maintaining full participation in the P&O Study will be deemed in compliance with salinity discharge requirements in their waste discharge requirements or conditional waivers consistent with the Salt Control Program. During the P&O Study, the permittee must maintain current efforts to control levels of salinity in the discharge.

The Salinity Conditional Prohibition shall sunset at the end of Phase I of the Salt Control Program.

Nitrate Control Program

The Conditional Prohibition of Nitrate Discharges shall apply to all permittees discharging nitrate pursuant to Board-issued waste discharge requirements and conditional waivers, except those dischargers regulated under the Board's Irrigated Lands Regulatory Program (ILRP). Dischargers regulated under the ILRP will instead be required to comply with the initial phase of the Nitrate Control Program through an amendment to the ILRP General Orders, which the Central Valley Water Board shall consider within 18 months of the effective date of the Basin Plan Amendment.

For those permittees subject to the Conditional Prohibition, the prohibition shall apply from the time of receiving a Notice to Comply until such time that the permittees' existing waste discharge requirements or conditional waivers regulating the discharge of nitrate are updated or amended to reflect requirements of the Nitrate Control Program, or such time that the Central Valley Water Board affirmatively notifies the permittee that their permit complies with the Nitrate Control Program without the need for further update or amendments. Until such time as the discharger receives a Notice to Comply, the relevant waste discharge requirements or conditional waiver provisions governing the discharge of nitrate shall remain in force.

Conditional Prohibition of Nitrate Discharges to Groundwater

Upon receiving a Notice to Comply from the Central Valley Water Board, discharges of nitrate are prohibited unless a permittee is implementing the requirements of the Nitrate Control Program. These requirements include, but are not limited to, the development of an Early Action Plan (EAP), when so required, and the initiation of that EAP within 60 days of the submittal of the EAP to the Board, unless an extension has been granted by the Executive Officer. If a discharger has not elected to participate in the Management Zone Approach (Path B), the requirements of the Individual Permitting Approach (Path A) shall apply to the discharge. Compliance timelines are identified in the Nitrate Control Program.

After receiving a Notice to Comply with the Nitrate Control Program, all permittees subject to the Conditional Prohibition must provide either a Notice of Intent to comply with the Nitrate Control Program under Path A or be included as a participant in a previously-submitted Preliminary Management Zone Proposal (Path B). The Notice of Intent must be submitted within 330 days of receiving the Notice to Comply for Priority 1 Basins and within 425 days for remaining basins.

(a) Path A – Individual Permitting Approach

Permittees electing Path A must submit a Notice of Intent that includes an Initial Assessment to the Central Valley Water Board that complies with the applicable requirements of the Nitrate Control Program. Should the Initial Assessment identify the need for an Early Action Plan

(EAP), the proposed EAP must be submitted with the Notice of Intent. The discharger must initiate the activities proposed under the EAP within 60 days of the submittal of the EAP, unless the Board's Executive Officer deems the EAP to be incomplete. Revised EAPs must be submitted and implemented within timelines directed by the Board's Executive Officer. Should the Initial Assessment identify the need for an Alternative Compliance Project (ACP), the permittee must submit the proposed ACP with the Notice of Intent.

(b) Path B – Management Zone Approach

Permittees electing to comply under a Management Zone Approach must meet the timelines identified in the Nitrate Control Program, including, but not limited to, submitting a Preliminary Management Zone Proposal within 270 days (Priority 1 Basins) or within one year (remaining basins) of receiving a Notice to Comply with the Nitrate Control Program. The Preliminary Management Zone Proposal must document all permittees considering compliance under Path B for the Management Zone. When an EAP is required, the EAP must be submitted with the Preliminary Management Zone Proposal. Activities proposed under the EAP must be initiated within 60 days after submittal unless the Central Valley Water Board deems the EAP incomplete. Revised EAPs must be re-submitted and implemented within timelines directed by the Board's Executive Officer.

Surveillance and Monitoring Program Requirements for the Central Valley Salt and Nitrate Control Program

The overarching goals of the Salt and Nitrate Surveillance and Monitoring Program are to:

- Periodically assess the progress of the Salt and Nitrate Control Program and, if appropriate, support efforts to re-evaluate the requirements of the control program.
- Develop statistically-representative ambient water quality determinations and trend analyses for Total Dissolved Salts (TDS)/Electrical Conductivity (EC) and Nitrate as Nitrogen.
- Maximize the use of existing monitoring programs to provide needed data and avoid duplication of efforts.

The Central Valley Water Board will require permittees discharging salt and nitrate to provide information to the entity leading the surveillance and monitoring program to allow the Board to satisfy the monitoring goals. This information may come from the dischargers' monitoring efforts; monitoring programs conducted by state or federal agencies or collaborative watershed efforts; or from special studies evaluating effectiveness of management practices. Information gathered will be consolidated and evaluated by the entity leading this surveillance and monitoring effort and a Program Assessment Report will be submitted to the Board every five years that answers the following management questions.

- What are the ambient conditions and trends of salinity in surface waters throughout the Central Valley?
- What are the ambient conditions and trends of salinity and nitrate in the following groundwater zones for groundwater basins within the Central Valley Region: upper; lower; and production?

Within two years of the effective date of the Salt and Nitrate Control Program, or as extended with the approval of the Central Valley Water Board's Executive Officer, the entity leading the effort will submit to the Board a Work Plan that is compliant with all surface water and groundwater requirements set forth in this section. The Work Plan will include a Quality Assurance Project Plan (QAPP). Implementation of the Work Plan will be initiated within 30 days of the approval by the Central Valley Water Board's Executive Officer.

Permittees that discharge salt or nitrate in the Central Valley Region shall participate in the preparation of the Program Assessment Report by contributing funding for the preparation of the report and any additional activities necessary to ensure that all required information is available to the lead entity. Permittees that discharge salt or nitrate must either gather needed information required by the Work Plan for their area of contribution and provide the information to the lead entity in a format acceptable to the lead entity, or permittees must demonstrate their support for the lead entity to gather needed information by submitting documentation of such support from the lead entity. The requirements for participation shall be established by the lead entity and will consider factors such as participation in other existing groundwater quality monitoring programs that will contribute data to the Salt and Nitrate Monitoring Program, resources required to develop and implement the Monitoring Program, including preparation of the Program Assessment Reports, and other factors.

Surface Water Requirements

To assess ambient conditions and trends of salinity and other secondary MCLs in surface waters throughout the Central Valley, the monitoring program for surface waters will rely on data collected by existing Central Valley monitoring and assessment programs already established in the region as well as any additional information collected under the Salt and Nitrate Control Program.

The portion of the Work Plan that addresses the surface water component will include at a minimum:

- Description of how the entity leading the Salt and Nitrate Surveillance and Monitoring Program will utilize data collected by existing monitoring and assessment programs to evaluate ambient conditions and trends in major water bodies including but not limited to the Sacramento River, Feather River, San Joaquin River and Delta as well as their major tributaries;
- Identification of the monitoring programs and associated monitoring locations that will be utilized;
- Approach that will be used to compile data from existing surface water quality databases and other sources for use in the assessment;
- Approach to assess ambient water quality conditions and trends for selected secondary Maximum Contaminant Levels (SMCLs), including but not necessarily limited to salinity-related SMCLs. Identification of the specific SMCLs to be assessed by the SAMP and frequency of analysis will be included in the work plan.

Groundwater Requirements

The Salt and Nitrate Groundwater Monitoring Program (Groundwater Monitoring Program) shall be sufficiently robust to evaluate ambient water quality and trends in groundwater basins in the floor of the Central Valley Region, including all sub-basins within the following groundwater basins defined by Department of Water Resources Bulletin 118: Redding Area (#5-6); Sacramento Valley (#5-21); and San Joaquin Valley (#5-22). Remaining groundwater basins will be considered for incorporation after completion of the Phase I Prioritization and Optimization Study and before initiation of Phase II of the Salt Control Program.

The Groundwater Monitoring Program shall consider, as appropriate, Chapter 5 of the CV-SALTS SNMP (2016) as guidance during the development of the work plan and shall include, at a minimum, the following components:

- Groundwater Monitoring Program goals;
- Entities responsible for the collection and reporting of data from groundwater wells incorporated into the Groundwater Monitoring Program;
- Identification of the groundwater monitoring wells to be included in the program and how the selected wells will provide a representative assessment of ambient water quality and trends by basin/sub-basin;
- Governance and funding mechanisms and agreements necessary to ensure the Groundwater Monitoring Program obtains the required data;
- Procedures for review and revision of the Groundwater Monitoring Program;
- A QAPP that includes:
    - Characteristics of each well incorporated into the program, e.g., well types, logs and construction data, where available;

    - Sample collection requirements, e.g., water quality parameters, sampling frequency and collection methods;
    - Data reporting and management requirements
  - Approach to assess ambient water quality conditions and water quality trends for TDS/EC and Nitrate as Nitrogen in the Upper, Lower and Production Zones for each groundwater basin/sub-basin included in the Groundwater Monitoring Program; and
  - Approach to evaluate the progress of the Salt and Nitrate Control Program based on trends in water quality.

To the extent practicable, the Groundwater Monitoring Program will utilize data collected by existing Central Valley Water Board water quality monitoring programs to be cost-effective and establish consistency in how groundwater quality data are collected, managed, assessed and reported. In this regard, the Irrigated Lands Regulatory Program Groundwater Quality Trend Monitoring Program implemented by the Central Valley Groundwater Monitoring Collaborative is anticipated to provide the foundation for the development of the Groundwater Monitoring Program. Data developed under the Irrigated Lands Regulatory Program will be supplemented as needed, to ensure that the periodic Program Assessment Report is completed on schedule. Sources of supplemental data include but are not limited to Groundwater Ambient Monitoring and Assessment (GAMA) shallow domestic well monitoring program; USGS Oil and Gas Regional Groundwater Monitoring Program; routine Title 22 sampling program; monitoring programs associated with implementation of Groundwater Sustainability Plans; monitoring programs established to comply with WDRs/Conditional Waivers; monitoring programs established as part of the approval of a management zone under the nitrate control program, or through the direct collection of groundwater quality data.

Program Assessment Report Requirements

An assessment of ambient water quality conditions and trends shall be completed at least once every five years consistent with the requirements of the approved work plan. The first Program Assessment Report shall be submitted to the Central Valley Water Board no later than five years after the approval of the Work Plan and every five years thereafter, unless a revised reporting schedule is approved by the Board's Executive Officer.

Recommendations for Implementation to Other Agencies

Modify the Basin Plan in Chapter 4 Implementation as follows:

Recommendations to Other Agencies

General
The implementation of long-term salinity management in the Central Valley is critically important to the long-term sustainability of the Central Valley and its water supply. Failure to control salts will result in a decline of Central Valley surface and groundwater quality at an enormous cost to all water users of Central Valley waters, eventually creating greater hardship for the environment, agriculture, industry, municipal utilities, and the entire economy of the Central Valley and the State. The need to control and abate the impacts from increasing salinity through implementation of the Salt Control Program in the Central Valley is an important priority for the State of California and is consistent with the goals and objectives of the California Strategic Growth Plan (California Bond Accountability, 2008). Nearly two-thirds of the State's population and over 3 million acres of irrigated agricultural lands rely on waters from the Central Valley via the State's water project to meet their daily needs. A significant portion of the southern Central Valley's domestic, agricultural and industrial water supply is imported from the Sacramento/San Joaquin Delta via State and federal water projects. Delta water is of lower water quality than the Sierra Mountain waters that historically fed the valley and water projects import nearly 400 thousand tons of salt a year from the Delta into the valley.

Due to the complexity and far-reaching impacts of salt management in the valley, the Central Valley Water Board has determined that all users of Central Valley waters, within and outside of the Board's jurisdictional area, are considered stakeholders responsible for the successful implementation of the Salt Control Plan. Successful implementation will require significant participation and actions by federal, state, local agencies, districts, associations and other entities that use or transport Central Valley's waters. It is recommended that these entities participate in the P&O Study to be done under Phase I, and in the other two phases of the Salt Control Program as appropriate. Participation in the Phase I P&O Study may be done by providing financial, technical and policy support to the P&O Study. This participation is essential as findings from the P&O Study will direct the implementation of physical and non-physical projects in the phased Salt Control Program and coordination.

Recommendations to Federal Officials
The U.S. Federal Legislature should establish the Central Valley Salinity Act[19] to develop a Central Valley Salt Control Program and authorize the construction, operation, and maintenance of certain works in the San Joaquin and Tulare Lake Hydrologic Regions in the Central Valley to control the salinity of water delivered to users in the Central Valley and the State.

Recommendations to Federal Agencies and Departments
The U.S. Natural Resource Conservation Service, U.S. Department of Agriculture, U.S. Fish and Wildlife Service, U.S. Geological Service, U.S. Army Corps of Engineers and U.S. Bureau of Reclamation should participate in the P&O Study to understand how the Salt Control Program supports their agency's mission and provide funding for the P&O Study and subsequent phases of the Salt Control Program as appropriate.

[19] Similar to the Colorado River Basin Salinity Control Act (SCA), Public Law 93-320, enacted 24 June 1974.

The U.S. Environmental Protection Agency should participate in the P&O Study to understand how to integrate the agency's goals into the study. The Agency should provide funding to the P&O Study and future salt control implementation programs for studies on the impacts of salt discharges on the environment and determining appropriate mitigating measures to address the impacts.

Recommendations to the State Legislature
The State of California Legislature should include in future budgets or funding mechanisms a means to fund a portion of the P&O Study, fund implementation of the salt management solutions identified through P&O solutions, and fund other elements of the Salt and Nitrate Control Program for the Central Valley.

Recommendations to the State Water Board
The State Water Board should use its water rights permitting and enforcement authorities, as appropriate, to require participation in the P&O Study to those holders of water right permits for waters in the Central Valley. This is especially important when granting water rights separates water from its watershed resulting in the accumulation of salt in inland areas or the reduction in assimilative capacity of surface and groundwater, such as exporting of surface waters to areas outside of the Central Valley.
The State Water Board should seek and prioritize funding opportunities to fund a portion of the P&O Study and future implementation of the salt management solutions identified through P&O Solutions.
The State Water Board should support water resource programs that are related to salt management and should prioritize grant and other funding sources to support implementation of the Salt and Nitrate Control Program.

The State Water Board should develop or revise drought and conservation regulations, policies and plans to be consistent with maintaining a salt balance in the Central Valley. Such policies should balance the need for conservation where adequate recharge is needed to protect and maintain high quality groundwaters.

Recommendations to Other State Agencies and Departments
The California Department of Food and Agriculture, California Department of Fish and Wildlife, California Department of Conservation and the California Department of Water Resources should participate and provide funding to the P&O Study to ensure that the implementation of its programs and policies are consistent with the requirements of the Salt Control Program.

The California Environmental Protection Agency, the California Department of Fish and Wildlife and the Delta Stewardship Council should participate in the P&O Study to ensure that proposed solutions found through the study are sound and will not adversely impact our resources or the Delta.

Recommendations to Counties and Municipalities
Municipalities within the Central Valley, as well as those outside of the Central Valley that benefit from the export and import of Central Valley surface waters, should participate in and support the P&O Study to ensure that actions they plan, permit and implement minimize reductions in surface water and groundwater quality, while promoting water sustainability.

County and municipal planning departments within the Central Valley should ensure their land use and development policies, ordinances and actions are consistent with the goals and

objectives of the Salt and Nitrate Control Program and requirements of the Groundwater Sustainability Agencies.

Recommendations to Groundwater Sustainability Agencies (GSAs)
Groundwater Sustainability Agencies (GSAs) within the Central Valley should participate in and support the P&O Study under the Salt Control Program as well as any Management Zones developed under the Nitrate Control Program to ensure that actions they plan, permit and implement minimize reductions in groundwater quality, while promoting water sustainability.

Recommendations to Local Agencies, **Districts, Associations, Commissions, Coalitions, Industries and other Entities Within and Outside of the Central Valley**

Agencies, Districts, Associations, Commissions, Coalitions, Industry and other entities[20] include parties that may or may not have been participating in the CV-SALTS initiative to develop the Salt and Nitrate Management Plan and that benefit from the export and import of State Water Project and Central Valley Water Project surface waters. These entities should participate in and provide funding for the P&O Study, and subsequent phases of the Salt Control Program as appropriate, and participate in management zone implementation plans as appropriate to ensure that actions they plan, permit or implement minimize reductions in surface and groundwater quality within the Central Valley while promoting water sustainability.

Agencies, Districts, Associations, Commissions, Coalitions, Industry and other entities[21] responsible for existing and future water resource and/or salinity treatment and/or disposal facilities within the Central Valley should participate in and provide funding for the P&O Study, and subsequent phases of the Salt Control Program as appropriate, and participate in management zone implementation plans as appropriate to ensure that actions they plan, permit or implement minimize reductions in surface and groundwater quality within the Central Valley while promoting water sustainability.

[20] These parties include, but are not limited to, Resource Conservation Districts, California League of Food Processors, Dairy CARES, Wine Institute, California Urban Water Agencies, Association of California Water Agencies, California Association of Sanitation Districts, Contra Costa Water District, Metropolitan Water District, San Joaquin River Authority, Kern Water District, Westlands Water District, East San Joaquin Water Quality Coalition, South Delta Water Agency, Friant Water Users Authority, San Joaquin River Water Contractors, State Water Contractors, Santa Clara Water District, East Bay Municipal Utility District, and others.

[21] These parties include, but are not limited to, Resource Conservation Districts, California League of Food Processors, Dairy CARES, Wine Institute, California Urban Water Agencies, Association of California Water Agencies, California Association of Sanitation Districts, Contra Costa Water District, Metropolitan Water District, San Joaquin River Authority, Kern Water District, Westlands Water District, East San Joaquin Water Quality Coalition, South Delta Water Agency, Friant Water Users Authority, San Joaquin River Water Contractors, State Water Contractors, Santa Clara Water District, East Bay Municipal Utility District, and others.

Definitions and Terminology Specific to the Salt and Nitrate Control Program

ALTERNATIVE COMPLIANCE PROGRAM (ACP): project(s) designed to provide the same or higher level of intended protection to water users that may be adversely affected by the discharge. For example, where a discharge is unable to comply with water quality objectives for nitrate, the permittee may seek an exception and offer to provide a safe and reliable alternative water supply for nearby drinking water wells that exceed or threaten to exceed the primary MCL for nitrate. Alternative Compliance Programs may be used in conjunction with other non-traditional regulatory options (including variances, exceptions, offsets, management zones and assimilative capacity allocations) to mitigate the adverse effects from a discharge until a feasible, practicable and reasonable means for meeting water quality objectives becomes available.

AQUIFER: A body of rock or sediment that is sufficiently porous and permeable to store, transmit and yield significant or economic quantities of groundwater to wells or springs.

AREA OF CONTRIBUTION: The portion(s) of Basin or Sub-basin where a discharge or discharges will co-mingle with the receiving water and where the presence of such discharge(s) could be detected.

ASSIMILATIVE CAPACITY: The capacity of a high-quality receiving water to absorb discharges of chemical constituents and still meet applicable water quality objectives that are protective of beneficial uses. State Water Board Resolution 68-16, the Statement of Policy with Respect to Maintaining High Quality of Waters in California (*State Antidegradation Policy*) requires a consideration, to the extent feasible, of the degree to which a discharge will affect the available assimilative capacity of a high-quality water relative to baseline water quality when the Central Valley Water Board is authorizing degradation. For the purposes of the Nitrate Control Program, available assimilative capacity may be calculated based on the average groundwater concentration of nitrate in the receiving water.

AVERAGE GROUNDWATER CONCENTRATION: The mean, volume-weighted concentration of a chemical constituent computed using the reasonably available, representative and reliable well data collected in a given Basin or Sub-basin during the most recent 10-year sampling period. The Central Valley Water Board may authorize longer or shorter averaging periods where necessary and appropriate. Statistical tools and transformations or other QA/QC data may be used to identify and disqualify outliers, to normalize data, or to spatially and temporally de-cluster well data to reduce the potential for sampling bias when estimating a mean concentration.

GROUNDWATER BASIN: A groundwater basin is an alluvial aquifer comprised of soils and sediments that are sufficiently porous and permeable to store, transmit and yield significant or economic quantifies of water to wells or springs. Groundwater basins have a definable bottom and well-defined lateral boundaries that are usually characterized by impermeable formations of rock or clay or by subsurface gradients that physically constrain subsurface flows to a limited direction. The California DWR (2006) has identified 126 groundwater basins or sub-basins in the Central Valley Region.

BEST EFFORTS: The applicable standard that must be met by a permittee when the Central Valley Water Board is authorizing waste discharges that may impact waters that are not considered "high quality waters." The Best Efforts approach involves making a showing that the constituent is in need of control and establishing limitations which the permittee can be expected to achieve using reasonable control methods. Factors that should be considered include: the water supply available to the permittee; the past effluent quality of the permittee; the effluent quality achieved by other similarly situated permittees; the good-faith efforts of the permittee to limit the discharge of the constituent; and the measures necessary to achieve compliance

BEST MANAGEMENT PRACTICES (BMP): Structural or non-structural (operational) control techniques designed to reduce the discharge of pollutants into receiving waters, especially for non-point sources where conventional wastewater treatment technologies are not a feasible or practicable compliance option.

BEST PRACTICABLE TREATMENT OR CONTROL (BPTC): The applicable standard that must be met by a permittee when the Central Valley Water Board is authorizing the degradation of high-quality waters pursuant to the State Antidegradation Policy. BPTC is conceptually comparable (but not legally synonymous) with other similar phrases commonly used to proscribe the most effective, efficient and affordable means for minimizing pollution, such as: Best Available Technology Economically Achievable (BATEA), Best Practicable Control Technology (BPT), Best Conventional Pollution Control Technology (BCT), and Best Management Practices (BMP).

CONDITIONAL PROHIBITION: Conditional prohibitions of discharge can be established in the Basin Plan for any type of discharge. (Wat. Code § 13243.) A conditional prohibition may specify conditions or areas where the discharge of waste, or the discharge of certain types of waste, will not be permitted unless specific conditions are met. A conditional prohibition established in the Basin Plan is directly enforceable by the Central Valley Water Board even in the absence of WDRs or a waiver regulating the discharge or discharger.

CURRENT GROUNDWATER QUALITY: For the purposes of the Salt and Nitrate Control Program, "current groundwater quality" is defined as the volume-weighted Average Concentration of a chemical constituent in a given Basin or Sub-basin. Current water quality can be computed separately for the Production Zone, Upper Zone, Lower Zone, Shallow Zone and Management Zone.

DE MINIMIS DISCHARGE: *De minimis* discharges of nitrate are specifically defined in the Central Valley Water Board's Nitrate Control Program.

DOMESTIC WELL: A water well used to supply water for the domestic needs of an individual residence or systems of four or less service connections (DWR Bulletin 74).

EARLY ACTION PLAN (EAP): For the purposes of the Central Valley Water Board's Nitrate Control Program, an EAP is a plan that identifies specific activities, and a schedule for implementing those activities, that will be undertaken to ensure immediate access to safe drinking water for those who are dependent on groundwater from wells that exceed the Primary MCL for nitrate. (See also the SNMP Nitrate Permitting Strategy).

EXCEPTION TO A WATER QUALITY OBJECTIVE: A special authorization, adopted by the Central Valley Water Board through the normal public review and approval process, that allows a discharge or group of discharges to groundwater, subject to various conditions, without an obligation to comply with certain water quality objectives that would normally apply to the given discharge for the period of the exception. Exceptions are limited to a specific term that is determined by the Central Valley Water Board. (See also the SNMP Exceptions Policy).

LOWER GROUNDWATER ZONE (see Fig. 1): The remaining portion of a groundwater basin or sub-basin's Production Zone excluding the Upper Zone. Wells constructed in the Lower Zone are generally used for some municipal supply and/or agricultural purposes. The upper boundary of the Lower Zone varies based on well construction information for a given basin or sub-basin (see reference citation in the definition of Upper Zone). Where the Corcoran Clay layer exists, the Corcoran Clay layer may define the lower boundary of the Upper Zone or the Lower Zone, pending the available well construction and groundwater use information. The groundwater beneath the Corcoran Clay is referred to as the lower aquifer system.

MANAGEMENT ZONE: A discrete and generally hydrologically contiguous area for which permitted discharger(s) participating in the management zone collectively work to meet the goals of the SNMP and for which regulatory compliance is evaluated based on the permittees collective impact, including any alternative compliance programs, on a defined portion of the aquifer. Where Management Zones cross groundwater basin or sub-basin boundaries, regulatory compliance is assessed separately for each basin or sub-basin. Management Zones must be approved by the Central Valley Water Board. (See also SNMP Management Zone Policy).

NATURALLY-OCCURRING BACKGROUND CONCENTRATION: The concentration of a chemical constituent that is likely to be present a given groundwater Basin or Sub-basin without the influence of anthropogenic activities that may have occurred over time, accounting for temporal and spatial variability.

OFFSET PROJECT: Project(s) implemented in conjunction with, but separately from, a discharge where the net impact of both on receiving water quality is better than what would be expected to occur if the discharge was required to comply with waste discharge requirements prescribed in the absence of any offset. (See also the Offsets Policy).

PERCHED GROUNDWATER (see Fig. 1): Groundwater that is supported by a zone of material of low permeability located above an underlying main body of groundwater with little or no hydrologic connectivity to the underlying main aquifer. In most cases, Perched Groundwater is excluded when characterizing the Production Zone, Upper Zone or Shallow Zone of the main Aquifer which makes up a given DWR Basin or Sub-basin.

PRODUCTION ZONE FOR GROUNDWATER (see Fig. 1): The portion of a basin or sub- basin from which the majority of groundwater is being pumped and utilized. The Production Zone includes the Upper Zone and the Lower Zone.

RECEIVING WATER(S): A surface waterbody (lake or stream) or a groundwater Basin or Sub-basin into which pollutants are discharged.

SALINITY: For purposes of implementing the Salt and Nitrate Control Plan, the definition of "salinity" and "salt" includes only: electrical conductivity, total dissolved solids, fixed dissolved solids, chloride, sulfate, and sodium.

SALT MANAGEMENT AREA: A defined groundwater basin or sub-basin that can be used receive and contain water with elevated salinity concentrations in order to remove the salt from sensitive areas until such time that the collected salts can be removed from the area for disposal or use.

SATURATED GROUNDWATER ZONE (see Fig. 1): The area below the land surface in which all pore space between soil, sand and rock particles is filled with water. The Saturated Zone is below the Unsaturated Zone and excludes areas of soil moisture where water is held by capillary action in the upper unsaturated soil or rock.

SHALLOW GROUNDWATER ZONE (see Fig. 1): The shallowest portion within the upper zone where groundwater would be considered to constitute an aquifer (which is defined as a "body of rock or sediment that is sufficiently porous and permeable to store, transmit, and yield significant or economic quantities of groundwater to wells and springs" [DWR, 2003]). In all cases, relevant groundwater does not include perched water. For example, this may be the upper portion of the upper zone that generally encompasses the shallowest 10% of the domestic water supply wells in a given basin or sub-basin. When determining the upper portion of the upper zone based on the shallowest 10% of the domestic wells in a given area, variations in well depth across the basin or sub-basin due to hydrogeologic conditions or other factors should be considered.

SUB-BASIN: A sub-basin is a smaller, but contiguous, area of the aquifer within a larger groundwater basin. The sub-basin boundaries can be defined both vertically and horizontally by a number of factors including, but not limited to: mineral or chemical concentrations, pumping practices, porosity, ownership, overlying land uses, jurisdictional oversight, flow gradients, tributary relationships, or other variables that merit the sub-basin be managed differently from adjacent areas in the same larger groundwater basin. The California DWR (2006) has identified 126 groundwater basins or sub-basins in the Central Valley Region; 41 of these aquifers are located on the valley floor, and the remainder are located in the surrounding foothills and mountains.

TRIGGER(s): A concentration or level for a specific constituent (e.g. TDS) or parameter (e.g. Electrical Conductivity) which, when equaled or exceeded, may require some permittees to initiate certain actions or implement certain measures.

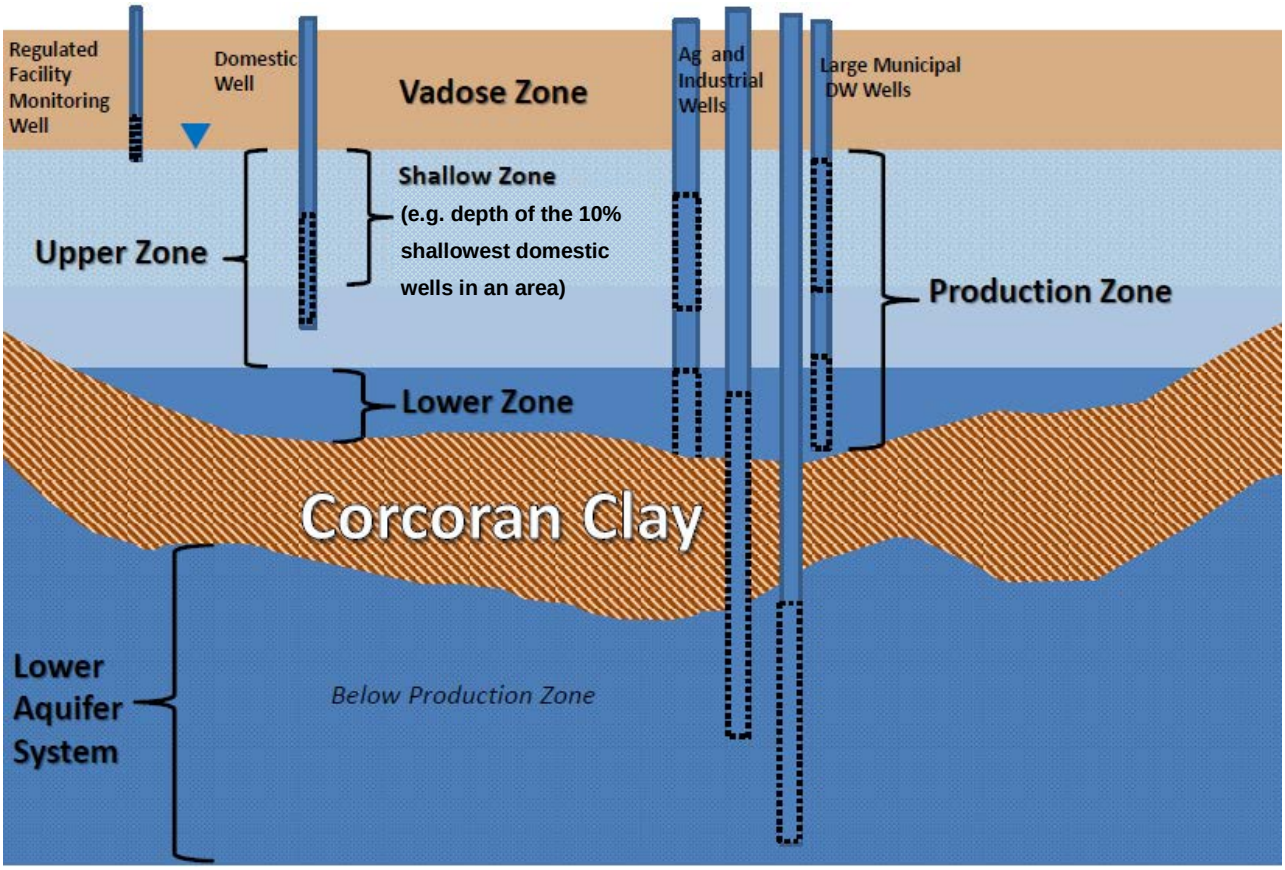
UNSATURATED ZONE (see Fig. 1): The area below the land surface in which the pore space between soil, sand and rock particles contains varying degrees of both air and water in ratios that inhibit extraction of significant or economic quantities of groundwater extraction. The term "Unsaturated Zone" is generally considered to be synonymous with the term "Vadose Zone."

UPPER GROUNDWATER ZONE (see Fig. 1): The portion of the groundwater basin, sub-basin or management zone from which most domestic wells draw water. It generally extends from the top of the saturated zone to the depth to which domestic wells are generally constructed (screened). The lower boundary of the Upper Zone varies based on well construction information for a given basin or sub-basin. The Corcoran Clay layer may define the lower boundary of the Upper Zone or the Lower Zone, pending the available

well construction and groundwater use information. (as described in Section 2 of LWA/LSCE; Region 5: Updated Groundwater Quality Analysis and High Resolution Mapping for Central Valley Salt and Nitrate Management Plan; June, 2016).

VARIANCE TO WATER QUALITY STANDARD: A special authorization, adopted by the Central Valley Water Board through the normal public review and approval process, that allows an NPDES-permitted discharge(s) to surface waters or a waterbody, subject to various conditions, without an obligation to comply with certain water quality standards that would normally apply to the given discharge(s) or waterbody. Variances are limited to specific terms governed by federal law and must also be approved by U.S. EPA. Variances apply solely to surface waterbodies or discharges to those surface waters.

Figure X-1: Schematic of Aquifer System Within Corcoran Clay Extent[1]



Legend

Unsaturated (Vadose) Zone

Groundwater Table - Top of saturated aquifer at the top of Upper Zone

Shallow Zone - Depth of the shallowest 10% of the domestic wells in an area (or alternative identified in the Nitrate Control Program).

Production Zone

The portion of basin or sub-basin from which the majority of groundwater is being pumped and utilized.

Upper Zone The portion of the groundwater basin, sub-basin or management zone from which most domestic wells draw water (Defined by well depths and screening intervals).

Lower Zone The remaining portion of a groundwater basin or sub-basin's Production Zone excluding the Upper Zone. Wells constructed in the Lower Zone are generally used for some municipal supply and/or agricultural purposes.

Below Production Zone

Well Depth

Screen Depth

[1] For the purposes of this program, calculations for Upper, Lower and Production Zones do not extend below the Corcoran Clay

Proposed Modifications to the Basin Plans' Variance Policy

Variance Policy

The following paragraphs include proposed modifications and additions to the Sacramento River and San Joaquin River Basin Plan's *Chapter 4 Implementation* in the sections indicated below. Note that these changes are also proposed for the Tulare Lake Basin Plan.

Control Action Considerations of the Central Valley ~~Regional~~ Water Board

Policies and Plans

Variance Policy for Surface Waters

As part of its state water quality standards program, states have the discretion to include variance policies. (40 C.F.R., §131.13.) This policy provides the *Central Valley Water Board*~~Regional Water Board~~ with the authority to grant a variance from application of water quality standards under certain circumstances.

I. Variances from Surface Water Quality Standards for Point Source Dischargers

A. A permit applicant or permittee subject to an NPDES permit may apply to the *Central Valley Water Board*~~Regional Water Board~~ for a variance from a surface water quality standard for a specific constituent(s), as long as the constituent is not a priority toxic pollutant identified in 40 C.F.R., §131.38(b)(1). A permit applicant or permittee may not apply to the *Central Valley Water Board*~~Regional Water Board~~ for a variance from a surface water quality standard for temperature. The application for such a variance shall be submitted in accordance with the requirements specified in section II of this Policy. The Central Valley Water Board may adopt variance programs that provide streamlined approval procedures for multiple dischargers that share the same challenges in achieving their water quality based effluent limitation(s) (WQBELs) for the same pollutant(s). The *Variance Program for Salinity Water Quality Standards* in section III, below, is a multiple discharger variance program. Permittees that qualify for the *Variance Program for Salinity Water Quality Standards* by meeting the criteria in section III.1. may submit a salinity variance application in accordance with the requirements specified in section III of this Policy.

B. The *Central Valley Water Board*~~Regional Water Board~~ may not grant a variance if:

(1) Water quality standards addressed by the variance will be achieved by implementing technology-based effluent limitations required under sections 301(b) and 306 of the Clean Water Act, or

(2) The variance would likely jeopardize the continued existence of any endangered species under section 4 of the Endangered Species Act or result in the destruction or adverse modification of such species' critical habitat.

C. The *Central Valley Water Board*~~Regional Water Board~~ may approve all or part of a requested variance, or modify and approve a requested variance, if the permit applicant demonstrates a variance is appropriate based on at least one of the six following factors:

(1) Naturally occurring pollutant concentrations prevent the attainment of the surface water quality standard; or
(2) Natural, ephemeral, intermittent, or low flow conditions or water levels prevent the attainment of the surface water quality standard, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating state water conservation requirements to enable surface water quality standards to be met; or
(3) Human caused conditions or sources of pollution prevent the attainment of the surface water quality standard and cannot be remedied or would cause more environmental damage to correct than to leave in place; or
(4) Dams, diversions, or other types of hydrologic modifications preclude the attainment of the surface water quality standard, and it is not feasible to restore the waterbody to its original condition or to operate such modification in a way that would result in the attainment of the surface water quality standard; or
(5) Physical conditions related to the natural features of the waterbody, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality preclude attainment of aquatic life protection of surface water quality standards; or
(6) Controls more stringent than those required by sections 301(b) and 306 of the Clean Water Act would result in substantial and widespread economic and social impact.

D. In making a determination on a variance application that is based on factor (3) in paragraph C above, the *Central Valley Water Board*~~Regional Water Board~~ may consider the following:

(1) Information on the type and magnitude of adverse or beneficial environmental impacts, including the net impact on the receiving water, resulting from the proposed methodologies capable of attaining the adopted or proposed WQBEL.
(2) Other relevant information requested by the *Central Valley Water Board*~~Regional Water Board~~ or supplied by the applicant or the public.

E. In making a determination on a variance application that is based on factor (6) in paragraph C.~~,~~ above, the *Central Valley Water Board*~~Regional Water Board~~ may consider the following:

(1) The cost and cost-effectiveness of pollutant removal by implementing the methodology capable of attaining the adopted or proposed WQBEL for the specific constituent(s) for which a variance is being requested.
(2) The reduction in concentrations and loadings of the pollutant(s) in question that is attainable by source control and pollution prevention efforts as compared to the reduction attainable by use of the methodology capable of attaining the adopted or proposed WQBEL.
(3) The overall impact of attaining the adopted or proposed WQBEL and implementing the methodologies capable of attaining the adopted or proposed WQBEL.

(4) The technical feasibility of installing or operating any of the available methodologies capable of attaining the WQBEL for which a variance is sought.

(5) Other relevant information requested by the *Central Valley Water Board*~~Regional Water Board~~ or supplied by the applicant or the public.

F. A determination to grant or deny a requested variance shall be made in accordance with the procedures specified in section II, below. Procedures specified in section III, below, will be used for applicants that qualify for the *Variance Program for Salinity Water Quality Standards*.

G. A variance applies only to the permit applicant requesting the variance and only to the constituent(s) specified in the variance application.

H. A variance or any renewal thereof shall be for a time as short as feasible and shall not be granted for a term greater than ten years.

I. Neither the filing of a variance application nor the granting of a variance shall be grounds for the staying or dismissing of, or a defense in, a pending enforcement action. A variance shall be prospective only from the date the variance becomes effective.

J. A variance shall conform to the requirements of the State Water Board's Antidegradation Policy (State Water Board Resolution 68-16).

II. Variance Application Requirements and Processes

A. An application for a variance from a surface water quality standard for a specific constituent(s) subject to this Policy may be submitted at any time after the permittee determines that it is unable to meet a WQBEL or proposed WQBEL based on a surface water quality standard, and/or an adopted wasteload allocation. The variance application may be submitted with the renewal application (i.e., report of waste discharge) for a NPDES permit. If the permittee is seeking to obtain a variance after a WQBEL has been adopted into a NPDES permit, the WQBEL shall remain in effect until such time that the *Central Valley Water Board*~~Regional Water Board~~ makes a determination on the variance application.

B. The granting of a variance by the *Central Valley Water Board*~~Regional Water Board~~ is a discretionary action subject to the requirements of the California Environmental Quality Act. As such, the *Central Valley Water Board*~~Regional Water Board~~ may require the variance applicant to prepare such documents as are necessary so that the *Central Valley Water Board*~~Regional Water Board~~ can ensure that its action complies with the requirements set forth in the California Environmental Quality Act, or the ~~Regional Water~~ Board may use any such documents that have been prepared and certified by another state or local agency that address the potential environmental impacts associated with the project and the granting of a variance.

C. A complete variance application must contain the following:

(1) Identification of the specific constituent(s) and water quality standard(s) for which a variance is sought;

(2) Identification of the receiving surface water, and any available information with respect to receiving water quality and downstream beneficial uses for the specific constituent;

(3) Identification of the WQBEL(s) that is being considered for adoption, or has been adopted in the NPDES permit;

(4) List of methods for removing or reducing the concentrations and loadings of the pollutants with an assessment of technical effectiveness and the costs and cost effectiveness of these methods. At a minimum, and to the extent feasible, the methods must include source control measures, pollution prevention measures, facility upgrades and end-of-pipe treatment technology. From this list, the applicant must identify the method(s) that will consistently attain the WQBELs and provide a detailed discussion of such methodologies;

(5) Documentation of at least one of the following over the next ten years. Documentation that covers less than ten years will limit the maximum term that the *Central Valley Water Board*~~Regional Water Board~~ can consider for the variance:

(i) That naturally occurring pollutant concentrations prevent the attainment of the surface water quality standard; or

(ii) That natural, ephemeral, intermittent, or low flow conditions or water levels prevent the attainment of the surface water quality standard, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges to enable surface water quality standards to be met; or

(iii) That human caused conditions or sources of pollution prevent the attainment of the surface water quality standard from which the WQBEL is based, and it is not feasible to remedy the conditions or sources of pollution; or

(iv) That dams, diversions, or other types of hydrologic modifications preclude the attainment of the surface water quality standard from which the WQBEL is based, and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in attainment of the surface water quality standard; or

(v) Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection of surface water quality standards from which the WQBEL is based; or

(vi) That installation and operation of each of the available methodologies capable of attaining the WQBEL would result in substantial and widespread economic and social impact.

(6) Documentation that the permittee has reduced, or is in the process of reducing, to the maximum extent practicable, the discharge of the pollutant(s) for which a variance is sought through implementation of local pretreatment, source control, and pollution prevention efforts; and,

(7) A detailed discussion of a proposed interim discharge limitation(s) that represents the highest level of ~~treatment~~ *constituent reduction* that the permittee can consistently achieve during the term of the variance. Such discussion shall

also identify and discuss any drought, water conservation, and/or water recycling efforts that may cause certain constituents in the effluent to increase, or efforts that will cause certain constituents in the effluent to decrease with a sufficient amount of certainty. When the permittee proposes an interim discharge limitation(s) that is higher than the current level of the constituent(s) in the effluent due to the need to account for drought, water conservation or water recycling efforts, the permittee must provide appropriate information to show that the increase in the level for the proposed interim discharge limitation(s) will not adversely affect beneficial uses, is consistent with state and federal antidegradation policies (State Water Board Resolution No. 68-16 and 40 C.F.R., § 131.12.), and is consistent with anti-backsliding provisions specified in section 402(o) of the Clean Water Act. If the permittee indicates that certain constituents in the effluent are likely to decrease during the term of the variance due to recycling efforts or management measures, then the proposed interim discharge limitation(s) shall account for such decreases.

(8) Copies of any documents prepared and certified by another state or local agency pursuant to Public Resources Code section 21080 et seq.; or, such documents as are necessary for the *Central Valley Water Board*~~Regional Water Board~~ to make its decision in compliance with Public Resources Code section 21080 et seq.

D. Within 60 days of the receipt of a variance application, the *Central Valley Water Board*~~Regional Water Board~~ shall determine that the variance application is complete, or specify in writing any additional relevant information, which is deemed necessary to make a determination on the variance request. Such additional information shall be submitted by the applicant within a time period agreed upon by the applicant and the ~~Regional Water~~ Board*'s* Executive Officer. Failure of an applicant to submit any additional relevant information requested by the ~~Regional Water~~ Board*'s* Executive Officer within the agreed upon time period may result in the denial of the variance application.

E. The *Central Valley Water Board*~~Regional Water Board~~ shall provide a copy of the variance application to USEPA Region 9 within 30 days of finding that the variance application is complete.

F. Within a reasonable time period after finding that the variance application is complete, the *Central Valley Water Board*~~Regional Water Board~~ shall provide public notice, request comment, and schedule and hold a public hearing on the variance application. When the variance application is submitted with the NPDES permit renewal application (i.e., report of waste discharge), the notice, request for comment and public hearing requirement on the variance application may be conducted in conjunction with the ~~Regional Water~~ Board's process for the renewal *or amendment* of the NPDES permit.

G. The *Central Valley Water Board*~~Regional Water Board~~ may approve the variance, either as requested, or as modified by the ~~Regional Water~~ Board. The ~~Regional Water~~ Board may take action to approve a variance and renew and/or modify an existing NPDES permit as part of the same Board meeting. The permit shall contain all conditions needed to implement the variance, including, at a minimum, all of the following:

(1) An interim effluent limitation for the constituent(s) for which the variance is sought. The interim effluent limitation(s) must be consistent with the current level of the constituent(s) in the effluent and may be lower based on anticipated improvement in effluent quality. The *Central Valley Water Board*~~Regional Water Board~~ may consider granting an interim effluent limitation(s) that is higher than the current level if the permittee has demonstrated that drought, water conservation, and/or water recycling efforts will cause the quality of the effluent to be higher than the current level and that the higher interim effluent limitation will not adversely affect beneficial uses. When the duration of the variance is shorter than the duration of the permit, compliance with effluent limitations sufficient to meet the water quality criterion upon the expiration of the variance shall be required;

(2) A requirement to prepare and implement a pollution prevention plan pursuant to Water Code section 13263.3 to address the constituent(s) for which the variance is sought;

(3) Any additional monitoring that is determined to be necessary by the *Central Valley Water Board*~~Regional Water Board~~ to evaluate the effects on the receiving water body of the variance from water quality standards;

(4) A provision allowing the *Central Valley Water Board*~~Regional Water Board~~ to reopen and modify the permit based on any revision to the variance made by the *Central Valley Water Board*~~Regional Water Board~~ during the next revision of the water quality standards or by *U.S.* EPA upon review of the variance; and

(5) Other conditions that the *Central Valley Water Board*~~Regional Water Board~~ determines to be necessary to implement the terms of the variance.

H. The variance, as adopted by the *Central Valley Water Board*~~Regional Water Board~~ in section G, is not in effect until it is approved by U.S. EPA.

I. Permit limitations for a constituent(s) contained in the applicant's permit that are in effect at the time of the variance application shall remain in effect during the consideration of a variance application for that particular constituent(s), *unless a stay is granted by the State Water Resources Control Board under Water Code section 13321*.

J. The permittee may request a renewal of a variance in accordance with the provisions contained in paragraphs A, B and C and this section. For variances with terms greater than the term of the *NPDES* permit, an application for renewal of the variance may be submitted with the renewal application for the NPDES permit in order to have the term of the variance begin concurrent with the term of the permit. The renewal application shall also contain information concerning ~~its~~ *the permittee's* compliance with the conditions incorporated into its permit as part of the original variance and shall include information to explain why a renewal of the variance is necessary. As part of its renewal application, a permittee shall also identify all efforts the permittee has made, and/or intends to make, towards meeting the standard(s). Renewal of a variance may be denied if the permittee did not comply with any of the conditions of the original variance.

K. All variances and supporting information shall be submitted by the *Central Valley Water Board*~~Regional Water Board~~ to the U.S. EPA Regional Administrator within 30 days of the date of the ~~Regional Water~~ Board's final variance decision for approval and shall include the following:

(1) The variance application and any additional information submitted to the *Central Valley Water Board*~~Regional Water Board~~;
(2) Any public notices, public comments, and records of any public hearings held in conjunction with the request for the variance;
(3) The *Central Valley Water Board*~~Regional Water Board~~'s final decision; and
(4) Any changes to NPDES permits to include the variance.

L. All variances shall be reviewed during the *Central Valley Water Board*~~Regional Water Board~~'s triennial review process of this Basin Plan. For variances with terms that are greater than the term of the permit, the ~~Regional Water~~ Board may also review the variance upon consideration of the permit renewal.

III. Variance Program for Salinity Water Quality Standards

The State Water Board and the *Central Valley Water Board*~~Regional Water Board~~ recognize that salt is impacting beneficial uses in the Central Valley and management of salinity in surface and ground waters is a major challenge for dischargers. *No proven means exist at present that will allow ongoing human activity in the Basin and maintain salinity at current levels throughout the Basin.* ~~In response, the Water Boards initiated t~~ *T*he Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) ~~in 2006. The State Water Board *Recycled Water Policy* requires the development of salt and nutrient management plans protective of ground water and submittal of these plans to the Regional Water Board by May 2016. These plans are to become the basis of basin plan amendments to be considered by the Regional Water Board by May 2017. CV-SALTS~~ is ~~the~~*a* stakeholder ~~effort working to~~*that* develop*ed a* comprehensive salt and nitrate management plan~~s~~ (SNMP~~s~~) that ~~will satisfy the Recycled Water Policy's salt and nutrient management plans. CV-SALTS is undertaking technical work to analyze~~*documents* salt and nitrate conditions in surface and ground water in the Central Valley, *and* ~~identify~~ *identifies* implementation measures~~,~~ and ~~develop~~monitoring strategies to ensure environmental and economic sustainability. ~~The technical work under development includes developing the models for loading and transport of salt, development and evaluation of effective management practices, and implementing activities to ensure beneficial uses are protected. Participation by all stakeholders is necessary to assure that the work is scientifically justified, supported by broad stakeholder representation, and completed in a timely fashion. The Regional Water Board has indicated its support for the comprehensive effort through CV-SALTS in Resolutions R5-2006-0024, R5-2010-0024, and R5-2013-0149 and the March 2010 Memorandum of Agreement between the Regional Water Board, the Central Valley Salinity Coalition and the State Water Board.~~ *The SNMP recommends a long-term salinity management strategy that is phased over time. The first phase (Phase I) consists of developing a Prioritization and Optimization Study for long-term salinity management which is intended to be a feasibility study that identifies appropriate regional and sub-regional projects, including location, routing and implementation and operations of salt management projects. Phase II will consist of environmental permitting, obtaining funding, and engineering and design. Phase III would then consist of construction of physical projects as identified in the previous phases. Because the salinity management strategy is phased over time, there is a need for an interim salinity permitting approach to be implemented during Phase 1 and while transitioning from Phase I to Phase II. The interim salinity permitting approach is anticipated to require 15 years and will be re-evaluated prior to implementation of Phase II. Only permittees that are participating in the Prioritization and Optimization Study may apply for a variance under this Salinity Variance Program.*

A. During the development ~~and initial implementation of the SNMPs by CV-SALTS~~*of the Prioritization and Optimization Study*, permittees who qualify may apply for a variance

from salinity water quality standards if they have or will have WQBELs for salinity that they are unable to meet by submitting a salinity variance application. The *Salinity Variance Program* as described specifically herein is for municipal and ~~domestic~~ industrial wastewater dischargers that have or will implement local pretreatment, source control, and pollution prevention efforts to reduce the effluent concentrations of salinity constituents and are now faced with replacing the municipal water supply with a better quality water or installing costly improvements, such as membrane filtration treatment technology, such that widespread social and economic impacts are expected consistent with the justification provided for the case study cities in the *Staff Report for the Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins and the Water Quality Control Plan for the Tulare Lake Basin to add Policies for Variances from Surface Water Quality Standards for Point Source Dischargers, Variance Program for Salinity, and Exception from Implementation of Water Quality Objectives for Salinity, June 2014*. Consistent with the planned development ~~and implementation of the SNMPs~~*of the Prioritization and Optimization Study*, no salinity variance under this section shall be approved after ~~30 June 2019~~*[15 years from effective date of these amendments]*. For the purposes of the Salinity Variance Program, salinity water quality standards are defined to only include water quality standards for the following constituents: electrical conductivity, total dissolved solids, chloride, sulfate and sodium.

B. An application for a variance for a specific salinity water quality standard may be submitted at any time after the permittee determines that it is unable to meet a WQBEL or proposed WQBEL based on a salinity water quality standard. Preferably, the salinity variance application should be submitted with the renewal application (i.e., report of waste discharge) for a NPDES permit. If the permittee is seeking to obtain a variance after a WQBEL has been adopted into a NPDES permit, the WQBEL shall remain in effect until such time that the *Central Valley Water Board*~~Regional Water Board~~ makes a determination on the variance application. *For dischargers that are participating in the same prioritization and optimization study, i.e. a study that covers their watershed or their groundwater basin, the dischargers may submit a joint application as long as the joint application contains all the information identified in paragraph C with individual discharger information provided for paragraphs C.7. through C.10.*

C. An application for variance from WQBELs based on a salinity water quality standard must contain the following:

(1) Identification of the salinity constituents for which the variance is sought;
(2) Identification of the receiving surface water, and any available information with respect to receiving water quality and downstream beneficial uses for the specific constituent;
(3) Identification of the WQBEL that is being considered for adoption, or has been adopted in the NPDES permit;
(4) A description of salinity reduction/elimination measures that have been undertaken as of the application date, if any;
(5) A Salinity Reduction Study Work Plan, which at a minimum must include the following:
    (i) Data on current influent and effluent salinity concentrations,
    (ii) Identification of known salinity sources,
    (iii) Description of current plans to reduce/eliminate known salinity sources,
    (iv) Preliminary identification of other potential sources,

(v) A proposed schedule for evaluating sources,
(vi) A proposed schedule for identifying and evaluating potential reduction, elimination, and prevention methods.

(6) An explanation of the basis for concluding that there are no readily available or cost-effective methodologies available to consistently attain the WQBELs for salinity.

(7) A detailed discussion explaining why the permittee's situation is similar to or comparable with the case studies supporting the *Salinity Variance Program* identified in the *Staff Report for the Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins and the Water Quality Control Plan for the Tulare Lake Basin to add Policies for Variances from Surface Water Quality Standards for Point Source Dischargers, Variance Program for Salinity, and Exception from Implementation of Water Quality Objectives for Salinity, June 2014*.

(8) A detailed discussion of proposed interim discharge limitation(s) that represents the highest level of treatment that the permittee can consistently achieve during the term of the variance. If the permittee indicates that certain constituents in the effluent are likely to decrease during the term of the variance due to efforts, then the proposed interim discharge limitation(s) shall account for such decreases.

(9) Documentation of the applicant's active participation in ~~CV-SALTS as indicated by a letter of support from CV-SALTS.~~ *the development of the Prioritization and Optimization Study.*

(10) A detailed plan of how the applicant will continue to participate in ~~CV-SALTS and how the applicant will contribute to the development and implementation of the SNMPs~~*development of the Prioritization and Optimization Study.*

D. After the receipt of a variance application for salinity, the *Central Valley Water Board*~~Regional Water Board~~ shall determine whether the variance application is complete and whether the permittee qualifies for consideration of the variance, or specify in writing any additional relevant information that is deemed necessary to make a determination on the salinity variance request. Such additional information shall be submitted by the applicant within a time period agreed upon by the applicant and the *Central Valley Water Board's*~~Regional Water Board~~ Executive Officer. Failure of an applicant to submit any additional relevant information requested by the ~~Regional Water~~ Board*'s* Executive Officer within the time period specified by the Executive Officer may result in the denial of the variance application for salinity.

E. After determining that the variance application for salinity is complete, the *Central Valley Water Board*~~Regional Water Board~~ shall provide notice, request comment, and schedule and hold a public hearing on the variance application for salinity. When the variance application is submitted with the NPDES permit renewal application (i.e., report of waste discharge), the notice, request for comment and public hearing requirement on the variance application may be conducted in conjunction with the *Central Valley Water Board*~~Regional Water Board~~'s process for the renewal of the NPDES permit.

F. The *Central Valley Water Board*~~Regional Water Board~~ may approve a salinity variance, either as requested, or as modified by the *Central Valley Water Board*~~Regional Water Board~~, after finding that the permittee qualifies for the salinity variance, the attainment of the WQBEL is not feasible *consistent with the demonstrations based on the case studies identified in the Staff Report for the Amendments to the Water Quality Control*

Plan for the Sacramento River and San Joaquin River Basins and the Water Quality Control Plan for the Tulare Lake Basin to add Policies for Variances from Surface Water Quality Standards for Point Source Dischargers, Variance Program for Salinity, and Exception from Implementation of Water Quality Objectives for Salinity, June 2014, the permittee has implemented or will implement feasible salinity reduction/elimination measures and the permittee continues to participate in *the development of the prioritization and optimization studies for long-term salinity management*~~CV-SALTS consistent with the demonstrations based on the case studies identified in the *Staff Report for the Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins and the Water Quality Control Plan for the Tulare Lake Basin to add Policies for Variances from Surface Water Quality Standards for Point Source Dischargers, Variance Program for Salinity, and Exception from Implementation of Water Quality Objectives for Salinity, June 2014*~~. The *Central Valley Water Board*~~Regional Water Board~~ may take action to approve a variance and issue a new, or reissue or modify an existing NPDES permit as part of the same Board meeting. The permit shall contain all conditions needed to implement the variance, including, at a minimum, all of the following:

(a) The interim effluent limitation(s) that are determined to be attainable during the term of the variance. When the duration of the variance is shorter than the duration of the permit, compliance with effluent limitations sufficient to meet the water quality criterion upon the expiration of the variance shall be required;

(b) A requirement to implement the Salinity Reduction Study Work Plan submitted with the variance application as required by paragraph C.5, above;

(c) A requirement to participate in ~~CV-SALTS and contribute to~~ the development ~~and implementation~~ of the ~~SNMPs~~ *Prioritization and Optimization Study* in accordance with the plan required by paragraph C.10, above.

(d) Any additional monitoring that is determined to be necessary to evaluate the effects on the receiving water body of the variance from water quality standards;

(e) A provision allowing the *Central Valley Water Board*~~Regional Water Board~~ to reopen and modify the permit based on any revision to the variance made by the *Central Valley Water Board*~~Regional Water Board~~ during the next revision of the water quality standards;

(f) Other conditions that the *Central Valley Water Board*~~Regional Water Board~~ determines to be necessary to implement the terms of the variance.

G. Permit limitations for a substance contained in the applicant's permit that are in effect at the time of the variance application shall remain in effect during the consideration of the variance application for that particular substance.

H. The permittee may request a renewal of a salinity variance in accordance with the provisions contained in paragraphs B and C of this section. For variances with terms greater than the term of the permit, an application for renewal of the salinity variance may be submitted with the renewal application for the NPDES permit in order to have the term of the variance begin concurrent with the term of the permit. The renewal application shall also contain information concerning its compliance with the conditions incorporated into its permit as part of the original variance, and shall include information to explain why a renewal of the variance is necessary. As part of its renewal application, a permittee shall also identify all efforts the permittee has made, and/or intends to make, towards meeting the standard. Renewal of a variance may be denied if the permittee did not comply with the conditions of the original variance.

I. ~~A~~ll variances shall be reviewed during the *Central Valley Water Board*~~Regional Water Board~~'s triennial review process of this Basin Plan. For variances with terms that are greater than the term of the permit, the *Central Valley Water Board*~~Regional Water Board~~ may also review the variance upon consideration of the permit renewal.

Proposed Modifications to the Basin Plans' Exceptions Policy

Exceptions Policy For Salinity, Nitrate, and/or Boron

The following paragraphs include proposed modifications and additions to the Sacramento River and San Joaquin River Basin Plan's *Chapter 4 Implementation* in the sections indicated below. Note that these changes are also proposed for the Tulare Lake Basin Plan.

Control Action Considerations of the Central Valley ~~Regional~~ Water Board

Policies and Plans

~~Limited Term~~ Exceptions from Basin Plan Provisions and Water Quality Objectives for Groundwater and for Non-NPDES Dischargers to Surface Waters

Pursuant to Water Code sections 13050 and 13240 et seq., the *Central Valley Water Board*~~Regional Water Board~~ has adopted beneficial use designations and water quality objectives that apply to surface and ground waters in the basins covered by this Basin Plan as well as programs of implementation. The Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) is a stakeholder effort ~~to~~ *that* develop*ed a* comprehensive salt and nitrate management plan~~s~~ (SNMP~~s~~) ~~by May 2016 that is expected to result in basin plan amendments that will be considered by the Regional Water Board by May 2017. CV-SALTS is undertaking technical work to analyze~~*that documents* salt and nitrate conditions in surface and ground water in the Central Valley~~, identify~~ *and identifies* implementation measures~~,~~ and ~~develop~~ monitoring strategies to ensure environmental and economic sustainability. ~~The technical work under development includes developing the models for loading and transport of salt, development and evaluation of effective management practices, and implementing activities to ensure beneficial uses are protected. Participation by all stakeholders is necessary to ensure that the work is scientifically justified, supported by broad stakeholder representation, and completed in a timely fashion. The Regional Water Board has indicated its support for the comprehensive effort through CV-SALTS in Resolutions R5-2006-0024, R5-2010-0024, and R5-2013-0149 and the March 2010 Memorandum of Agreement between the Regional Water Board, the Central Valley Salinity Coalition and the State Water Board.~~*The SNMP identifies the need for a prioritized, long-term management strategy to address the need for providing safe drinking water while moving toward balanced salt and nitrate loading and managed restoration where reasonable, practicable and feasible.* The *Central Valley Water Board*~~Regional Water Board~~ finds that it is reasonable to grant exceptions to the discharge requirements related to the implementation of water quality objectives for salinity*, nitrate and boron* for non-NPDES discharge~~r~~s to surface water, and for discharges to groundwater ~~in order to allow for development and implementation of the SNMPs~~*if the permittee is actively participating in the implementation of the long-term Salt and Nitrate Control Program and it is infeasible, impracticable or unreasonable to prohibit the discharge or it is preferable to have a discharger and/or area specific and time-limited exception rather than a more lasting water quality standard revision or where a water quality standard should be revised*.

Exception Application Requirements Specific to Salinity

Under Phase I of the Salt Control Program, permittees that are in compliance with the conditions for the Alternative Permitting Approach are in compliance with their salinity limits. For the purposes of this Program, salinity and its constituents include, and are limited to, the following: electrical conductivity, total dissolved solids, chloride, sulfate and sodium. Additional conditions for exceptions to water quality objectives for salinity under Phase II and Phase III of the Salt Control Program may be incorporated in the future.

Exception to Discharge Requirements Related to the Implementation of Water Quality Objectives for ~~Salinity,~~ *Nitrate and/or Boron*

*(*1.*)* Any person[22] subject to waste discharge requirements and/or conditional waivers issued pursuant to Water Code 13269 that are not also NPDES permits may apply to the *Central Valley Water Board*~~Regional Water Board~~ for an exception to discharge requirements from the implementation of water quality objectives for ~~salinity,~~ *nitrate and/or boron. Recognized third party groups may apply on behalf of their members or for multiple permittees under a management zone.* The exception may apply to the issuance of effluent limitations and/or groundwater limitations that implement water quality objectives for ~~salinity,~~ *nitrate and/or boron* in groundwater, or to effluent limitations and/or surface water limitations that implement water quality objectives for ~~salinity,~~ *nitrate and/or boron* in surface water. For the purposes of this Program, ~~salinity and its constituents include, and are limited to, the following: electrical conductivity, total dissolved solids, chloride, sulfate and sodium.~~ *nitrate includes nitrate and other forms of nitrogen speciation (e.g. total inorganic nitrogen (TIN) and total Kjeldahl nitrogen (TKN)) used to address nitrate in groundwater.* The application for such an exception(s) shall be submitted in accordance with the requirements specified in *corresponding sections for nitrate and boron below (see sections ### and ###, respectively)*~~paragraph 8, below~~.

*(*2.*)* *When authorizing an* ~~An~~ exception to discharge requirements from the implementation of water quality objectives for ~~salinity,~~ *nitrate and/or boron* imposed as limitations in either waste discharge requirements and/or conditional waivers that are not also NPDES permits, ~~shall be set for a term not to exceed ten years~~ *the term for the exception shall generally not exceed 10-years, however the Central Valley Water Board shall have the discretion to adopt an exception for up to 50 years if the applicant(s) can demonstrate that it is necessary to further the management goals of the Salt and Nitrate Control Program. The Central Valley Water Board will have the authority to reauthorize (renew) an exception for one or more additional terms, the length of which shall be determined by the Central Valley Water Board but may only exceed 50 years if the management practices under the exception is resulting in significant, measurable and continuing improvements in water quality. The authorization of an exception, or any reauthorization, shall require approval of the Central Valley Water Board, after notice and hearing. The Central Valley Water Board shall also have the authority to rescind the authorization of an exception when the applicant(s) are not complying with the terms and conditions that are part of the exception. Any rescission of an exception may only occur after notice and hearing.*

~~For exception terms greater than five years, the Regional Water Board will review the exception five years after approval to confirm that the exception should proceed for the full term.~~

[22] The term "person" includes, but is not limited to, "any city, county, district, the state, and the United States, to the extent authorized by federal law." (Wat. Code, § 13050, subd. (c).)

~~The Regional Water Board review will be conducted during a public hearing. An exception may be renewed beyond the initial term if the SNMPs are still under development, and if a renewal application is submitted in accordance with the requirements specified in paragraph (8), below. A renewal must be considered during a public hearing held in accordance with paragraph 10, below.~~

(~~3.~~*)* *The Central Valley Water Board will require those discharger(s) with authorized exceptions to prepare a status report every 5 years summarizing compliance with the terms and conditions of the exception. The status reports may be presented individually for individual exceptions or collectively for exceptions granted to multiple dischargers. The Central Valley Water Board will conduct its review of exceptions in a public hearing. The Central Valley Water Board may terminate an exception when the applicant(s) are not complying with the terms and conditions that are part of the exception. Any rescission of an exception may only occur after notice and hearing.* ~~The Regional Water Board will consider granting an exception to the implementation of water quality objectives for salinity under this Program if the applicant is actively participating in CV-SALTS as indicated by the letter required under paragraph 8.e., below.~~

(~~4.~~*)* *Exceptions are intended to facilitate long-term attainment of water quality objectives under the Salt and/or Nitrate Control Program or to provide the time needed to revise an inappropriate water quality objective or beneficial use designation. The Central Valley Water Board will consider granting an exception to the implementation of water quality objectives for salinity, nitrate, or boron under this Program if the applicant is fully participating in the Salt and/or Nitrate Control Programs as indicated by the letter required under #####., below and meets the specific requirements for boron indicated in #####.* ~~When granting an exception to the implementation of water quality objectives for salinity under this Program, the Regional Water Board shall consider including an interim performance-based effluent limitation and/or groundwater limitation that provides reasonable protection of the groundwater or the receiving water, where appropriate. When establishing such a limitation, the Regional Water Board shall take into consideration increases in salinity concentrations due to drought, water conservation, and/or water recycling efforts that may occur during the term of the exception granted.~~

(~~5.~~*)* *The Central Valley Water Board will set interim performance-based requirements when the exception is authorized.*

(6) *Requirements associated with seeking and approving an exception shall include, but are not limited to: eligibility criteria, mitigation responsibilities, monitoring/reporting obligations, and expectations relevant to implementing the SNMP Management Goals.*

(7) *As a condition for reauthorizing/renewing an exception, the Central Valley Water Board will require those discharger(s) with authorized exceptions terms greater than ten years to prepare and submit a report every ten years that reassesses Best Management Practices (BMPs) and surveys available treatment technologies to determine if feasible, practicable and reasonable compliance options have become available. The Central Valley Water Board will include review of BMPs and available treatment technologies when conducting the public hearing to review compliance as described in paragraph 3 above. Following review of the BMPs and available treatment technologies, the Central Valley Water Board may revise requirements under the authorized exception.*

(8) *Where exceptions are sought in order to provide time to develop and approve a more appropriate water quality standard (uses and/or objectives), there must be a well-defined work plan (including a schedule of milestones) and a commitment by dischargers to provide the resources needed to complete the proposed process.*

(9) *Where existing water quality standards are unlikely to change, dischargers must explain how the proposed exception facilitates the larger long-term salt and/or nitrate strategy designed to ultimately attain those standards while in the interim allocating available resources to address more urgent water quality priorities such as provision of safe drinking water, where applicable.*

(10) Upon receipt of an application for an exception to the implementation of water quality objectives for any constituent~~salinity~~ under this Program, the *Central Valley Water Board*~~Regional Water Board~~ shall determine that the exception application is complete, or specify in writing any additional relevant information, which is deemed necessary to make a determination on the exception request. Failure of an applicant to submit any additional relevant information requested by the *Central Valley Water Board*~~Regional Water Board~~ Executive Officer within the applicable time period may result in the denial of the exception application.

(11) Within a reasonable time period after determining that the exception application is complete, the *Central Valley Water Board*~~Regional Water Board~~ shall provide notice, request comment, and schedule and hold a public hearing on the application within a timely manner. The notice and hearing requirements shall comply with those set forth in Water Code section 13167.5. The Board will approve an exception by ~~shall be issued through a resolution or special order that~~ amendings applicable waste discharge requirements and/or conditional waiver requirements.

Exception Application Requirements Specific to Nitrate

(1) *Exceptions for nitrate will not be considered unless an adequate supply of clean, safe, reliable and affordable drinking water is available for those who have been adversely affected by the non-compliant discharge(s).*

(2) *An applicant seeking an exception to the implementation of water quality objectives for nitrate under this Program must submit an application to the Central Valley Water Board. The applicant's request shall include the following (For a Management Zone that is seeking an Exception for all participating permittees, the Management Zone Implementation Plan may substitute for an Exception application as long as it includes all of the following information identified here):*

- *(a)* *An explanation/justification as to why the exception is necessary, and why the discharger is unable to ensure consistent compliance with existing effluent and/or groundwater/surface water limitations associated with nitrate at this time;*
- *(b)* *A description of the alternative compliance project(s), Early Action Plan (EAP) or other implementation measures that the applicant will implement or participate in, consistent with the Nitrate Permitting Strategy of this Basin Plan for individual or collective groups of dischargers.*
- *(c)* *Copies of any documents prepared and certified by another state or local agency pursuant to Public Resources Code section 21080 et seq.; or, such documents*

as are necessary for the Central Valley Water Board to make its decision in compliance with Public Resources Code section 21080 et seq.

(d) A work plan to provide an interim and permanent water supply for any person living in the area adversely affected by the discharge under the requested nitrate exception. The water supply work plan shall include a schedule of milestones and a description of financial commitments to assure completion of the interim and permanent water supply. Performance bonds may be required to assure timely implementation.

(e) A detailed plan of how the proposed implementation measures will further the long-term management goals of the Nitrate Control Program.

Exception Application Provisions Specific to Boron

(1) When granting an exception to the implementation of water quality objectives for *boron*~~salinity~~ under this Program, the *Central Valley Water Board* ~~Regional Water Board~~ shall require the discharger to prepare and implement a *Boron*~~Salinity~~ Reduction Study Work Plan, or a *boron*~~salinity~~-based watershed management plan. A *Boron*~~Salinity~~ Reduction Study Work Plan shall at a minimum include the following:

*(*a~~.~~*)* Data on current influent and effluent *boron*~~salinity~~ concentrations;
*(*b~~.~~*)* Identification of known *boron*~~salinity~~ sources;
*(*c~~.~~*)* Description of current plans to reduce/eliminate known *boron*~~salinity~~ sources;
*(*d~~.~~*)* Preliminary identification of other potential sources;
*(*e~~.~~*)* A proposed schedule for evaluating sources; and
*(*f~~.~~*)* A proposed schedule for identifying and evaluating potential reduction, elimination, and prevention methods.

A *boron*~~salinity~~-based watershed management plan shall at a minimum include the following:

*(*a~~.~~*)* A discussion of the physical conditions that affect surface water or groundwater in the management plan area, including land use maps, identification of potential sources of *boron*~~salinity~~, baseline inventory of identified existing management practices in use, and a summary of available surface and/or groundwater quality data;
*(*b~~.~~*)* A management plan strategy that includes a description of current management practices being used to reduce or control known *boron*~~salinity~~ sources;
*(*c~~.~~*)* Monitoring methods;
*(*d~~.~~*)* Data evaluation; and,
*(*e~~.~~*)* A schedule for reporting management plan progress.

(2~~6.~~*)* When granting an exception to the implementation of water quality objectives under this Program, the *Central Valley Water Board*~~Regional Water Board~~ will include a requirement to participate in CV-SALTS and contribute to the development and implementation of the SNMPs in accordance with the plan submitted under paragraph *(*8*)*~~.~~*(*f*)*, below.

(3~~7.~~*)* ~~The granting of an exception to the implementation of water quality objectives for *boron*salinity under this Program by the Regional Water Board is a discretionary action subject to the requirements of the California Environmental Quality Act. As such, the Regional Water Board may require the applicant for the exception to prepare such~~

~~documents as are necessary so that the Regional Water Board can ensure that its action complies with the requirements set forth in the California Environmental Quality Act or the Regional Water Board may use any such documents that have been prepared and certified by another state or local agency that address the potential environmental impacts associated with the project and the granting of an exception from implementation of water quality objectives for *boron*salinity in groundwater and/or surface water.~~

(4~~8.~~*)* A person seeking an exception to the implementation of water quality objectives for *boron*~~salinity~~ under this Program must submit an application to the *Central Valley Water Board*~~Regional Water Board~~. The person's request shall include the following:

*(*a~~.~~*)* An explanation/justification as to why the exception is necessary, and why the discharger is unable to ensure consistent compliance with existing effluent and/or groundwater/surface water limitations associated with *boron*~~salinity~~ constituents at this time;

*(*b~~.~~*)* A description of *boron*~~salinity~~ reduction/elimination measures that the discharger has undertaken as of the date of application, or a description of a salinity-based watershed management plan and progress of its implementation;

*(*c~~.~~*)* A description of any drought impacts, irrigation, water conservation and/or water recycling efforts that may be causing or cause the concentration of *boron*~~salinity~~ to increase in the effluent, discharges to receiving waters, or in receiving waters;

*(*d~~.~~*)* Copies of any documents prepared and certified by another state or local agency pursuant to Public Resources Code section 21080 et seq.; or, such documents as are necessary for the *Central Valley Water Board*~~Regional Water Board~~ to make its decision in compliance with Public Resources Code section 21080 et seq.

*(*e~~.~~*)* Documentation of the applicant's active participation in *the long-term salinity management strategy*~~CV-SALTS~~ as indicated by a letter of support from CV-SALTS.

*(*f~~.~~*)* A detailed plan of how the applicant will continue to participate in CV-SALTS and how the applicant will contribute to the development and implementation of the SNMPs.

~~*11. There will be no new salinity exceptions and salinity exceptions will not be renewed after 30 June 2019.*~~

Proposed Modifications to the Basin Plans to Incorporate a Drought and Conservation Policy

Drought and Conservation Policy

The following paragraphs include proposed modifications and additions to the Sacramento River and San Joaquin River Basin Plan's *Chapter 4 Implementation* in the sections indicated below. Note that these changes are also proposed for the Tulare Lake Basin Plan.

During emergencies such as drought, high quality water supplies diminish. Climate change is also anticipated to diminish available water supplies. Water conservation and water recycling can stretch limited water supplies, providing benefits to the people of the state. Conservation and recycling has the unintended consequence of creating compliance issues due to increased concentrations of constituents, such as salinity in discharges. It is the intent of the *Central Valley Water Board* to encourage conservation and water resource management. The purpose of this policy is to provide for permitting procedures to be applied to account for conditions associated with the loss of higher quality water supplies such as drought and climate change, and/or constituent increases directly related to voluntary and/or mandatory conservation measures and increased recycling efforts.

Unless otherwise excluded based on requirements of the Salt Control Program, a permittee (or third party group on behalf of collective permittees) may qualify for interim permit limits for salinity under one or more of the following conditions:

a) A drought emergency is declared by an authorized federal or state authority, as defined by the California Emergency Services Act;
b) A local drought emergency or other emergency is declared, consistent with the California Emergency Services Act that impacts availability of water supplies; or
c) Water conservation and/or water recycling efforts may be causing or cause the concentration of salinity to increase in the effluent, discharges to receiving waters, or in receiving waters.

During Statewide or Local Drought or Other Emergencies that Limit Water Supplies

Permittees (or third party group on behalf of collective permittees) shall receive interim effluent and/or groundwater/surface water limitations based on their historical salinity load (with consideration given to reasonable increment of use or changes in source water salinity concentration) and shall not exceed an EC concentration of 2,200 µS/cm as a 30-day running average. The water quality-based effluent/groundwater/surface water limitations may be established in terms of EC concentration or total dissolved solids (TDS) loading, however, concentration and loading limits shall not be applied at the same time. An EC to TDS ratio of 0.64 shall be used to convert the EC concentrations to TDS concentrations, unless a discharge-specific ratio can be demonstrated. The Central Valley Water Board has the discretion to adjust these limitations based on local conditions including but not limited to local beneficial use protection and site-specific salinity objectives. The interim effluent and/or groundwater/surface water limitations will remain in effect during the time period when one or more of the conditions noted in a or b, above, are met.

Limitations to Account for Water Conservation and Recycling Efforts

A permittee (or third party group on behalf of collective permittees) may qualify for interim permit limits for salinity by submitting documentation that water conservation and/or water recycling efforts cause the concentration of salinity to increase in the effluent, discharges to receiving waters, or in receiving waters. Interim permit limits will be based on one of the following.

a) Permittees (or third party group on behalf of collective permittees) who demonstrate that their permitted discharges have a lower salinity concentration than the receiving water salinity concentration shall receive interim effluent and/or groundwater/surface water limitations that do not exceed the receiving water salinity concentration, provided there are no unreasonable impacts to downstream/downgradient water quality.

b) The remaining permittees (or third party group on behalf of collective permittees) shall receive interim effluent and/or groundwater/surface water limitations based on TDS loading consistent with their historical load (with consideration given to reasonable increment of use or changes in source water salinity concentration) and shall not exceed an EC concentration of 2,200 µS/cm as a 30-day running average. An EC to TDS ratio of 0.64 shall be used to convert the EC concentrations to TDS concentrations, unless a discharge-specific ratio can be demonstrated. The Central Valley Water Board has the discretion to adjust these limitations based on other considerations such as local beneficial uses and site-specific salinity objectives.

Long Term Waste Discharge Requirements and Limitations for Groundwater

Permittees to groundwater who submit documentation describing a long-term commitment (20 year planning horizon) to water conservation and/or water recycling efforts may be eligible to use a long-term (10+ year) flow-weighted average to calculate compliance with effluent and/or groundwater limitations when it can be demonstrated using recharge models and long-term precipitation estimates that applicable narrative or numeric salinity objectives can be met in the receiving water over the term of the compliance period. Periodic reassessments based on the best available data need to be conducted every five years unless otherwise directed in the waste discharge requirements to ensure that salinity objectives will be met and beneficial uses are protected.

Proposed Modifications to the Basin Plans to Incorporate an Offsets Policy

Offsets Policy

The following paragraphs are proposed for addition to *Chapter 4 Implementation* of the Sacramento River and San Joaquin River Basin Plan and the Tulare Lake Basin Plan within the proposed Salt and Nitrate Control Program at a location in the chapter to be determined.

Offsets Policy for Salt and/or Nitrate Discharges to Groundwater

An offset is an alternative means of achieving compliance with Waste Discharge Requirements (WDRs), either alone or in combination with other actions, for a given pollutant or pollutants that may be authorized by the Central Valley Water Board. An offset allows for the management of sources and loads of the constituent of concern (not directly associated with the regulated discharge) so that the combined net effect on receiving water quality from the discharge and the offset is functionally-equivalent to or better than that which would have occurred by requiring the discharger to comply with its WDR at the point-of-discharge. In most cases, an offset project proposed for nitrate or salt discharges should be located within the same groundwater basin/sub-basin or management zone as the regulated discharge and is applicable to groundwater only. Application for an offset may be submitted by individual permittees, or collective permittees within a management zone, by a third party group on behalf of its members, or other forms of collective groups of permittee recognized by the Central Valley Water Board. The decision to pursue an offset is voluntary. Offsets must be:

(4) Proposed by the permittee[23] as an Alternative Compliance Project (ACP)[24]

(5) Approved by the Central Valley Water Board; and

(6) Enforceable through a WDR or other orders issued by the Board.

The following requirements apply to all offsets:

(1) Where an offset project is being considered for implementation, it should be consistent with any local implementation plans established to manage salt or nitrate concentrations in the same area. And, in general, it is desirable to encourage offsets in the same groundwater basin/sub-basin where the discharge occurs. However, offsets may also be used to incentivize implementation of some large-scale projects such as a regional regulated brine line or establish a mitigation fund to provide safe drinking water, provided that the offsets still result in a positive net effect on receiving water quality.

(2) When there is no assimilative capacity available in the receiving water, the offset shall result in a net improvement in existing water quality (e.g., the offset ratio must be > 1:1) compared to baseline regulatory requirements. (Offset ratios < 1:1 may be authorized

[23] Throughout this document the term "discharger" can connote either an individual discharger or a coalition of dischargers regulated under a common set of categorical WDRs or watershed/groundwater basin/sub-basin permit or order, or dischargers working collaboratively within a management zone.
[24] See Appendix H guidance on development of an ACP project.

only in accordance with the state's antidegradation policy unless an exception is granted or Time Schedule Order or Compliance Schedule Order allows a less stringent interim ratio to apply.)

(3) Offsets shall be for the same class of constituents.

(4) The proposed package (discharge + offset project) cannot result in unmitigated localized impairments (e.g., "hotspots") to sensitive areas (especially drinking water supply wells) or have a disproportionate impact on a disadvantaged community in the sub-basin. Downgradient well owners shall be notified and encouraged to participate in the offset approval process.

(5) Offsets shall be approved by the Central Valley Water Board. The Board may elect to approve a specific offset project (a 1-step process) through the issuance of a permit, or the Board may generally authorize the use of offsets in a permit and subsequently approve individual offset projects in subsequent Board actions (e.g., a 2-step procedure).

(6) Offsets shall apply to a specific discharge for a defined period. Offsets may be renewed but must be periodically reviewed and reauthorized by the Central Valley Water Board. The length of that period will be specified by the Central Valley Water Board when the offset is approved.

(7) The terms and conditions governing an approved offset shall specify the remedial actions that must be undertaken by the discharger, and the metric(s) used to trigger such obligations, in the event that the offset project fails.

(8) The offset project shall include a monitoring and reporting program sufficient to verify that the pollution reduction credits are actually being generated as projected and that these credits are adequate to offset the discharge loads in the ratio approved by the Central Valley Water Board. Pollutant removal, reduction, neutralization, transformation, dilution through recharge and support of a mitigation fund may all be acceptable means of generating offset credits (subject to appropriate verification).

When authorizing an offset, the Central Valley Water Board shall consider the following conditions:

(1) When it is not feasible, practicable or reasonable for the discharge to comply directly with applicable WDRs.

(2) When it is not feasible, practicable or reasonable to prohibit a discharge that is unable to comply with applicable WDRs.

(3) When there is no assimilative capacity available in the receiving water or as a condition for allocating any available assimilative capacity in order to authorize a discharge.

(4) When the net effect of authorizing the discharge, including the proposed offset project, would result in better water quality in the groundwater basin/sub-basin or better support beneficial use attainment than is likely to occur if the discharge was required to comply with the applicable WDRs at the point-of-discharge.

(5) When the proposed offset project will provide substantially greater and more immediate public health protection than is expected to result if the discharger was required to comply with the applicable WDRs at the point-of-discharge or the non-compliant discharge was prohibited completely.

(6) When the proposed offset project is an integral part of and facilitates a larger strategic plan or project designed to ultimately achieve attainment of water quality standards or restoration of a water body.

(7) Other factors such as the: relative location of the discharge and offset project and potential impacts on downgradient waters, reliability of the recharge, the extent that a groundwater recharge project improves water quality and/or water storage in the aquifer above that which would occur without the project, impacts on the vadose zone over time, mixing assumptions, brine disposal, and whether the offset is proposed as a temporary or permanent alternate compliance strategy.

Within a reasonable time period after determining that the proposed offset application is complete, the Central Valley Water Board shall provide notice, request comment, and schedule and hold a public hearing on the application within a timely manner. The notice and hearing requirements shall comply with those set forth in Water Code section 13167.5. The offset shall be issued through a resolution or special order that amends applicable waste discharge requirements and/or conditional waiver requirements.

Application of Secondary Maximum Contaminant Levels to Protect Municipal and Domestic Supply

The following paragraphs are proposed for addition to *Chapter 4 - Implementation* of the Sacramento River and San Joaquin River Basin Plan and the Tulare Lake Basin Plan under the heading, "*Actions and Schedule to Achieve Water Quality Objectives".*

Maximum Contaminant Levels (MCLs) are designed for water supplied to the public. State and federal drinking water regulations require that most surface waters or groundwater under the direct influence of surface waters, provide filtration and disinfection treatment to the source water prior to it being served to the public unless an exemption to that water system has been granted. In many cases, groundwater can be supplied to the public without the need of additional treatment due to removal of many constituents as water percolates into the groundwater.

Secondary MCLs were intended to protect public welfare for chemical constituents that may adversely affect the taste, odor, appearance or consumer acceptance of drinking water. Secondary MCLs related to salinity are identified in section 64449 (Table B) of Title 22 of the California Code of Regulations (Title 22) and were developed for consumer acceptance. Constituent concentrations ranging to the "Upper" level in Table 64449-B are acceptable if it is demonstrated that it is neither reasonable nor feasible to achieve lower levels. In addition, constituents ranging to the "Short Term" level may be authorized on a temporary basis consistent with the provisions of section 64449(d)(3), pending construction of treatment facilities or development of new water sources, or with the Drought and Conservation Policy (Section ##). Lower concentrations of these chemical constituents are desirable for promoting greater consumer confidence and acceptance of water supplied by community water systems, and, where it is reasonable and feasible to do so, WDRs should consider the "Recommended" values in section 64449 (Table B). These "Recommended" concentrations are not water quality objectives per se but should be considered water resource management goals similar to other public policy goals established by the Central Valley Water Board and State Water Board to encourage meeting the best possible water quality while allowing greater water conservation, increased use of recycled water, more stormwater harvesting, additional groundwater recharge and storage, better drought protection, and allowing agricultural and wastewater dischargers to continue to discharge to groundwater basins and surface water bodies.

To implement the SMCLs in the Chemical Constituents section of the surface water and groundwater quality objectives, the Central Valley Water Board shall consider, as appropriate, a number of site-specific factors when developing WDRs, including, but not limited to those identified in the Staff Report to Incorporate a Salt and Nitrate Control Program into the Central Valley Basin Plans in Section 4.2.10 (Central Valley Water Board, 2018).

For receiving waters that have been deemed exempt from surface water filtration requirements, compliance with chemical constituents in Table 64449-A shall be determined using an unfiltered water sample.[25]

[25] USEPA. *National Primary Drinking Water Regulations: Long Term 2 Enhanced Surface Water Treatment Rule*. 71 Federal Register: 654-786. January 5, 2006.

For receiving waters that are not exempt from surface water treatment requirements (i.e. 40 CFR Part 141, Subparts H, P, T & W), compliance with the Secondary Maximum Contaminant Levels for aluminum, copper, iron, manganese, silver, zinc, color and turbidity in Table 64449-A will be determined from samples that have been passed through a 1.5-micron filter to reduce filterable residue[26]; metal constituents will then be analyzed using the acid-soluble procedure described in EPA Approved Methods[27] as appropriate, or other methods approved by the Central Valley Water Board. Because this approach is intended to approximate the level of treatment normally applied to raw surface water sources before such water can be distributed to the public as drinking water, the Central Valley Water Board may adjust the filter size where necessary to more accurately represent site-specific conditions based on scientific evidence submitted for their consideration and after consultation with Division of Drinking Water and public comment. This provision applies solely to evaluating compliance with Secondary Maximum Contaminant Levels for certain metals and does not affect or alter the methods used to evaluate compliance with other water quality objectives that have been established for those same metals (e.g. as Primary MCLs, California Toxics Rule or National Toxic Rule constituents, or constituents with specific objectives listed in this Basin Plan).

For groundwaters, compliance with the Secondary Maximum Contaminant Levels for aluminum, copper, iron, manganese, silver, zinc, color and turbidity in Table 64449-A will be determined from samples that have been passed through a 1.5-micron filter to reduce filterable residue[31]; metal constituents will then be analyzed using the acid-soluble procedure described in EPA Approved Methods[32] as appropriate, or other methods approved by the Central Valley Water Board. Because this approach is intended to account for "removal of waste constituents as the water percolates through the ground to the aquifer," as described in WQ Order No. 73-04 and Water Quality Order No. 81-05, the Central Valley Water Board may adjust the filter size where necessary to more accurately represent site-specific conditions based on scientific evidence submitted for their consideration and after consultation with Division of Drinking Water and public comment. This provision applies solely to evaluating compliance with Secondary Maximum Contaminant Levels for certain metals and does not affect or alter the methods used to evaluate compliance with other water quality objectives that have been established for those same metals (e.g. Primary MCLs or constituents with specific objectives listed in this Basin Plan).

The Central Valley Water Board may require unfiltered samples be analyzed concurrently to assess general trends in receiving water quality, implement the state's Antidegradation Policy (Res. No. 68-16), and evaluate potential downstream impacts.

[26] Filter size recommended in EPA Approved Methods 30 CFR Part 136 for Total Dissolved Solids and Total Suspended Solids and is used for removing suspended solids from a solid prior to analysis. Filtering the sample will remove suspended solids that may contribute to turbidity and color in samples that may negatively impact analytical results for metal concentrations while better representing the dissolved solids that may pass through a water treatment plant's filtration system.

[27] Currently EPA Approved Methods are 200.7 and 200.8 for metals, Method 180.1 for turbidity and SM 2120 F-2011 for color. EPA methods are periodically updated and future approved methods may be applicable.

Estimated Costs To Agriculture

The following paragraphs are proposed for addition to the "ESTIMATED COSTS OF AGRICULTURAL WATER QUALITY CONTROL PROGRAMS AND POTENTIAL SOURCES OF FINANCING" section of the Sacramento River and San Joaquin River Basin Plan, Page IV-40 and the "Estimated Costs of Agricultural Water Quality Control Programs" section of the Tulare Lake Basin Plan, Page IV-30.

Central Valley-wide Salt and Nitrate Control Program

Cost Estimate for the Salt Control Program (Costs to Agriculture): Costs associated with the first phase of the Salt Control Program include costs associated with strategic planning, administration, and analyses and studies to support the Prioritization and Optimization Study (P&O Study). Costs are estimated to range from $357,000 to $696,000 per year for the first 10 years of the program. Cost identified after the first 10 years of the program are only speculative at this time and will be revised after the completion of the P&O Study. Costs are expressed as 2016 dollars.

Cost Estimate for the Nitrate Control Program (Costs to Agriculture): Costs associated with long-term restorations efforts are only speculative at this time. Costs associated with the Nitrate Control Program include costs associated with providing short-term safe drinking water supplies and development of Management Zones throughout the Priority 1 and Priority 2 basins/sub-basins. Costs are estimated to range from $24.1 million to $35.9 million per year. Costs are expressed as 2016 dollars.

Cost Estimate for the Surveillance and Monitoring Program (Costs to Agriculture): Costs associated with the Surveillance and Monitoring Program are costs designed to ensure the success of the Salt and Nitrate Control Program. Costs to agriculture are estimated to range from $70,000 to $130,000 per year. Costs are expressed as 2016 dollars.

Potential funding sources include:

1. *Private financing by individual and/or group sources.*
2. *Bonded indebtedness or loans from governmental institutions.*
3. *Federal grants or low-interest loan programs.*
4. *Single-purpose appropriations from federal or State legislative bodies.*
5. *Grant and loan programs administered by the State Water Resources Control Board and Department of Water Resources, which are targeted for agricultural water quality improvement. These programs include:*
    a) *Clean Water Act funds (State Water Resources Control Board)*
    b) *Agricultural Water Quality Grant Program (State Water Resources Control Board)*
    c) *Clean Water State Revolving Fund (State Water Resources Control Board) and*
    d) *Integrated Regional Water Management grants (State Water Resources Control Board, Department of Water Resources)*

APPENDIX

Modify the Sacramento River and San Joaquin River Basin Plan and the Tulare Lake Basin Plan by adding a new appendix, Nitrate Control Program Non-Prioritized Basins (page XX), as follows:

Appendix X-X Nitrate Control Program Non-Prioritized Basins

Non-Prioritized Basins		
Basin/Sub-basin Number (DWR Bulletin 118)	**Name**	**Notes**
2-4	Pittsburgh Plain	Listed as Non-Prioritized in Table D4-2 of SNMP
5.21.66	Solano	Listed as Non-Prioritized in Table D4-2 of SNMP
5.22.15	Tracy	Listed as Non-Prioritized in Table D4-2 of SNMP
2-3	Suisun-Fairfield Valley	Listed as Non-Prioritized in Table D4-2 of SNMP
5-21.52	Colusa	Listed as Non-Prioritized in Table D4-2 of SNMP
5-22.14	Kern County (Southeastern)	Listed as Non-Prioritized in Table D4-2 of SNMP
5-21.61	South Yuba	Listed as Non-Prioritized in Table D4-2 of SNMP
5-21.64	North American	Listed as Non-Prioritized in Table D4-2 of SNMP
5-21.57	Vina	Listed as Non-Prioritized in Table D4-2 of SNMP
5-22.16	Cosumnes	Listed as Non-Prioritized in Table D4-2 of SNMP
5-21.58	West Butte	Listed as Non-Prioritized in Table D4-2 of SNMP
5-21.68	Capay Valley	Listed as Non-Prioritized in Table D4-2 of SNMP
5-21.62	Sutter	Listed as Non-Prioritized in Table D4-2 of SNMP
5-21.56	Los Molinos	Listed as Non-Prioritized in Table D4-2 of SNMP
5-22.10	Pleasant Valley	Listed as Non-Prioritized in Table D4-2 of SNMP
5-21.60	North Yuba	Listed as Non-Prioritized in Table D4-2 of SNMP
5-21.65	South American	Listed as Non-Prioritized in Table D4-2 of SNMP
5-21.54	Antelope	Listed as Non-Prioritized in Table D4-2 of SNMP
5-21.59	East Butte	Listed as Non-Prioritized in Table D4-2 of SNMP

Non-Prioritized Basins		
Basin/Sub-basin Number (DWR Bulletin 118)	**Name**	**Notes**
5-21.51	Corning	Listed as Non-Prioritized in Table D4-2 of SNMP
5-21.50	Red Bluff	Listed as Non-Prioritized in Table D4-2 of SNMP
5-21.55	Dye Creek	Listed as Non-Prioritized in Table D4-2 of SNMP
5-22.09	Westside	Listed as Non-Prioritized in Table D4-2 of SNMP
5-21.53	Bend	Listed as Non-Prioritized in Table D4-2 of SNMP
5-6.04	Enterprise	Listed as Non-Prioritized in Table D4-2 of SNMP
5-6.03	Anderson	Listed as Non-Prioritized in Table D4-2 of SNMP
5-6.01	Bowman	Listed as Non-Prioritized in Table D4-2 of SNMP
5-6.06	South Battle Creek	Listed as Non-Prioritized in Table D4-2 of SNMP
5-6.05	Millville	Listed as Non-Prioritized in Table D4-2 of SNMP
5-6.02	Rosewood	Listed as Non-Prioritized in Table D4-2 of SNMP
5-1.01	Lower Goose Lake Valley	Outside of Valley Floor
5-1.02	Fandango Valley	Outside of Valley Floor
5-3	Jess Valley	Outside of Valley Floor
5-8	Mountain Meadows Valley	Outside of Valley Floor
5-20	Berryessa Valley	Outside of Valley Floor
5-23	Panoche Valley	Outside of Valley Floor
5-26	Walker Basin Creek Valley	Outside of Valley Floor
5-31	Long Valley	Outside of Valley Floor
5-35	McCloud Area	Outside of Valley Floor
5-36	Round Valley	Outside of Valley Floor
5-37	Toad Well Area	Outside of Valley Floor
5-38	Pondosa Town Area	Outside of Valley Floor
5-40	Hot Springs Valley	Outside of Valley Floor
5-41	Egg Lake Valley	Outside of Valley Floor
5-43	Rock Prairie Valley	Outside of Valley Floor
5-44	Long Valley	Outside of Valley Floor
5-45	Cayton Valley	Outside of Valley Floor
5-46	Lake Britton Area	Outside of Valley Floor
5-47	Goose Valley	Outside of Valley Floor
5-48	Burney Creek Valley	Outside of Valley Floor
5-49	Dry Burney Creek Valley	Outside of Valley Floor

Non-Prioritized Basins		
Basin/Sub-basin Number (DWR Bulletin 118)	**Name**	**Notes**
5-50	North Fork Battle Creek	Outside of Valley Floor
5-51	Butte Creek Valley	Outside of Valley Floor
5-52	Grays Valley	Outside of Valley Floor
5-53	Dixie Valley	Outside of Valley Floor
5-54	Ash Valley	Outside of Valley Floor
5-56	Yellow Creek Valley	Outside of Valley Floor
5-57	Last Chance Creek Valley	Outside of Valley Floor
5-58	Clover Valley	Outside of Valley Floor
5-59	Grizzly Valley	Outside of Valley Floor
5-60	Humbug Valley	Outside of Valley Floor
5-61	Chrome Town Area	Outside of Valley Floor
5-62	Elk Creek Area	Outside of Valley Floor
5-63	Stonyford Town Area	Outside of Valley Floor
5-64	Bear Valley	Outside of Valley Floor
5-65	Little Indian Valley	Outside of Valley Floor
5-66	Clear Lake Cache Formation	Outside of Valley Floor
5-68	Joseph Creek	Outside of Valley Floor
5-69	Squaw Flat	Outside of Valley Floor
5-70	Los Banos Creek Valley	Outside of Valley Floor
5-71	Vallecitos Creek Valley	Outside of Valley Floor
5-80	Brite Valley	Outside of Valley Floor
5-82	Cuddy Canyon Valley	Outside of Valley Floor
5-83	Cuddy Ranch Area	Outside of Valley Floor
5-84	Cuddy Valley	Outside of Valley Floor
5-85	Mil Potrero Area	Outside of Valley Floor
5-86	Joseph Creek	Outside of Valley Floor
5-87	Middle Fork Feather River	Outside of Valley Floor
5-88	Stony Gorge Reservoir	Outside of Valley Floor
5-89	Squaw Flat	Outside of Valley Floor
5-90	Funks Creek	Outside of Valley Floor
5-91	Antelope Creek	Outside of Valley Floor
5-92	Blanchard Valley	Outside of Valley Floor
5-93	North Fork Cache Creek	Outside of Valley Floor
5-94	Middle Creek	Outside of Valley Floor
5-95	Meadow Valley	Outside of Valley Floor
5-4	Big Valley	Outside of Valley Floor
5-5	Fall River Valley	Outside of Valley Floor
5-7	Lake Almanor Valley	Outside of Valley Floor
5-9	Indian Valley	Outside of Valley Floor
5-10	American Valley	Outside of Valley Floor

Non-Prioritized Basins		
Basin/Sub-basin Number (DWR Bulletin 118)	**Name**	**Notes**
5-11	Mohawk Valley	Outside of Valley Floor
5-13	Upper Lake Valley	Outside of Valley Floor
5-14	Scotts Valley	Outside of Valley Floor
5-15	Big Valley	Outside of Valley Floor
5-16	High Valley	Outside of Valley Floor
5-17	Burns Valley	Outside of Valley Floor
5-18	Coyote Valley	Outside of Valley Floor
5-19	Collayomi Valley	Outside of Valley Floor
5-25	Kern River Valley	Outside of Valley Floor
5-27	Cummings Valley	Outside of Valley Floor
5-28	Tehachapi Valley Area	Outside of Valley Floor
5-29	Castac Lake Valley	Outside of Valley Floor
5-30	Lower Lake Valley	Outside of Valley Floor
5-12.01	Sierra Valley	Outside of Valley Floor
5-12.02	Chilcoot	Outside of Valley Floor
5-2.01	South Fork Pitt River	Outside of Valley Floor
5-2.02	Warm Springs Valley	Outside of Valley Floor

TABLE OF CONTENTS

Executive Summary 5
Issue 5
Environmental Setting 6
Groundwater Basins/Sub-basins 8
Beneficial Uses and Water Quality Objectives 9
MUN Water Quality Objectives 9
AGR Water Quality Objectives 9
Salt and Nitrate Conditions in the Central Valley Region 9
Surface Water Quality 9
Groundwater Quality 10
Proof of Concept 11
Salt and Nitrate Control Program 12
Salt Control Program 17
Nitrate Control Program 19
Additional Policies to Support Implementation of the Salt and Nitrate Control Programs 23
Conditional Prohibition of Discharge for Surface and Groundwater discharges 23
Variance Program for Salinity Water Quality Standards for Surface Water Discharges Subject to NPDES Permits Only 24
Exceptions from Basin Plan Provisions and Water Quality Objectives Other Than Nitrates for Groundwater and for Non-NPDES Dischargers to Surface Water 24
Drought and Conservation Policy for Surface and Groundwater 25
Offsets for Groundwater Only 25
Application of Secondary Maximum Contaminant Levels to Protect MUN for Surface and Groundwater 25
Surveillance and Monitoring Program for Surface and Ground Water 26
Recommendations to Other Agencies 26
Amendment Language for the Sacramento River and San Joaquin River Basin Plan And Tulare Lake Basin Plan 27
Table of Contents 119
List of Acronyms 126
1 Introduction 130
1.1 Purpose and Function of this Document 137
1.2 Scope of Assessment 138
2 Environmental and Regulatory Setting 139
2.1 Environmental Setting 139
2.1.1 Basin Characteristics 139
2.1.2 Water Quality Conditions 146
2.2 Regulatory Setting 162
2.2.1 Central Valley Water Board Water Quality Control Plans (Basin Plans) 162
2.3 Salt and Nitrate Issues Identified and Constraints Under Current Regulatory Framework 173
3 Laws, Regulation, and Policies Relevant to Basin Planning 181
3.1 Legal Requirements for Establishing and Amending the Basin Plan 182

3.2 Legal Requirements for Establishing, Designating and Modifying Beneficial Uses...183
3.2.1 Federal Regulations and Guidance 183
3.2.2 State Regulations and Guidance 184
3.2.3 State Water Board Sources of Drinking Water Policy (Resolution 88-63) 185
3.3 Laws that Apply to the Establishment of Water Quality Objectives....186
3.3.1 Federal Regulations and Guidance 186
3.3.2 State Statute, Regulations and Guidance 186
3.4 Laws that Apply to the Establishment of an Implementation Program in the Basin Plan 187
3.4.1 Federal Regulations and Guidance 187
3.4.2 State Statues, Regulations, and Guidance 187
3.5 Economic Review 187
3.5.1 Water Code section 13241 188
3.5.2 Water Code section 13141 188
3.5.3 Public Resources Code section 21159 188
3.6 Environmental Review – CEQA 188
3.7 Antidegradation Policies 188
3.7.1 Federal Antidegradation Policy 188
3.7.2 State Antidegradation Policy....189
3.8 State Laws and Regulations Relevant to Salt and Nitrate Management 189
3.8.1 Porter-Cologne Water Quality Control Act 189
3.8.2 Human Right to Water 190
3.8.3 Sustainable Groundwater Management Act....191
4 Alternatives 192
4.1 Process to Develop Alternatives to Address Salt and Nitrate Concerns....192
4.1.1 CV-SALTS Initiative....192
4.1.2 Technical Studies 194
4.1.3 Case Studies....196
4.1.4 Criteria to Select Preferred Alternative....198
4.2 Proposed Control Program and Associated Policies....198
4.2.1 Salt Control Program 201
4.2.2 Program to Control and Permit Nitrate Discharges to Groundwater....221
4.2.3 Mechanism to Ensure Early Participation and Implementation....260
4.2.4 Surveillance and Monitoring Program Requirements for the Salt and Nitrate Control Program 263
4.2.5 Definitions and Terminology Specific to the Salt and Nitrate Control Program....272
4.2.6 Proposed Modifications to the Basin Plan's Variance Policy....273
4.2.7 Proposed Modifications to the Basin Plans' Exceptions Policy....278
4.2.8 Drought and Conservation Policy 289
4.2.9 Offsets Policy 295
4.2.10 Secondary Maximum Contaminant Level (SMCL) Clarification....301
4.3 Summary....321
4.3.1 No Action Alternative....321
4.3.2 Incorporate a Central Valley–wide Salt and Nitrate Control Program with Supporting Policies and Guidance....321
5 Antidegradation....323

5.1 Antidegradation Compliance....323
5.1.1 State Antidegradation Policy....323
5.1.2 Federal Antidegradation Policy....323
5.1.3 Degradation that May Reasonably Be Expected to Occur After Adoption of the Salt and Nitrate Control Program....324
5.2 Salt Control Program....325
5.2.1 Degradation that May Occur Under the Salt Control Program and Related Policies326
5.2.2 Consistency with the State Antidegradation Policy....328
5.2.3 Consistency with the Federal Antidegradation Policy....332
5.3 Nitrate Control Program....333
5.3.1The Nitrate Control Program....333
5.3.2 Consistency with the State Antidegradation Policy....337
5.3.3 Consistency with the Federal Antidegradation Policy....340
5.4 Secondary MCLs....341
5.4.1 Degradation that may occur under the SMCL Revisions....341
5.4.2 Consistency with the State Antidegradation Policy....341
5.4.3 Consistency with the Federal Antidegradation Policy....342
5.5 Limitations....343
6 Consistency With Laws, Plans, and Policies....344
6.1 Consistency with Federal and State Laws....344
6.1.1 Clean Water Act....344
6.1.2 Federal and State Endangered Species Act....347
6.1.3 Consistency with Water Code section 106.3....348
6.1.4 Sustainable Groundwater Management Act....350
6.1.5 Assembly Bill 32 – California Global Warming Solutions Act....351
6.2 Consistency with State Water Board Policies....351
6.2.1 State Policy for Water Quality Control....352
6.2.2 State Water Board Resolution 68-16, the Statement of Policy with Respect to Maintaining High Quality of Waters in California (State Antidegradation Policy)....352
6.2.3 Water Quality Control Policy for the Enclosed Bays and Estuaries of California....352
6.2.4 Policy and Action Plan for Water Reclamation in California....353
6.2.5 Sources of Drinking Water Policy....353
6.2.6 Pollutant Policy Document....353
6.2.7 Policies and Procedures for Investigation and Cleanup and Abatement of Discharges under Water Code section 13304....353
6.2.8 Consolidated Toxic Hot Spots Cleanup Plan....354
6.2.9 Nonpoint Source Management Plan & the Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program....354
6.2.10 Water Quality Enforcement Policy....355
6.2.11 Policy for Developing California's Clean Water Act Section 303(d) List (Listing Policy)....355
6.2.12 Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California....356
6.2.13 Water Quality Control Policy for Addressing Impaired Waters: Regulatory Structure and Options....356

6.2.14 Policy for Compliance Schedules in National Pollutant Discharge Elimination System Permits 357
6.2.15 Onsite Wastewater Treatment Systems Policy (OWTS) 358
6.2.16 Policy for Water Quality Control for Recycled Water 358
6.2.17 Human Right to Water as a Core Value and Directing its Implementation in Water Board Programs and Activities 359
6.3 Consistency with Central Valley Regional Water Quality Board Policies 359
6.3.1 Urban Runoff Policy 359
6.3.2 Controllable Factors Policy 359
6.3.3 Water Quality Limited Segment Policy 360
6.3.4 Antidegradation Implementation Policy 360
6.3.5 Application of Water Quality Objectives Policy 360
6.3.6 Watershed Policy 361
6.3.7 Drinking Water Policy for Surface Waters of the Delta and its Upstream Tributaries 361
7 Environmental Analysis 362
7.1 Environmental Review 362
7.1.1 Background 362
7.1.2 CEQA Scoping Meeting and Comments 362
7.1.3 Setting/Baseline 363
7.1.4 Proposed Project Analysis 363
7.1.5 Cumulative Impact Analysis 364
7.1.6 No Action Alternative Analysis 368
7.1.7 Statement of Overriding Considerations 372
8 Economic Analysis 374
8.1 Economic Analyses for Total Project Costs 374
8.1.1 Introduction 374
8.1.2 Analysis of the No Project Alternative 375
8.1.3 Analysis of the Preferred Alternative 378
8.2 Calculating Costs to Agriculture Under Proposed Salt and Nitrate Control Program 387
8.2.1 Overview 387
8.2.2 Salt Control Program 389
8.2.3 Nitrate Control Program 391
8.2.4 Surveillance and Monitoring Program 392
8.2.5 Overall Salt and Nitrate Control Program Estimated Costs 396
8.2.6 Potential Funding Sources 396
8.2.7 Future Review and Evaluation of Costs 397
9 References 398

Table of Appendices

Appendix A, Summary of Surface Water Quality for the Central Valley A-1
Appendix B, Summary of Groundwater Quality for the Central Valley B-1
Appendix C, Regulation of Waste Discharges in the Central Valley C-1
Appendix D, Alternative Matrices for Programs and Policies D-1
Appendix E, List of Non-Prioritized Groundwater Basins E-1
Appendix F, Full Text – Title 22 §64449 ..... F-1
Appendix G, Considerations When Implementing SMCL Water Quality Objectives When Developing Waste Discharge Requirements (WDRs) G-1
Appendix H, Guidelines for Proposing an Acceptable Alternative Compliance Project H-1
Appendix I, Summary Salt Control Program with Examples I-1
Appendix J, Implementation of the Recommended Alternative for the Nitrate Control Program J-1
Appendix K, Environmental Checklist K-1
Appendix L, CV-SALTS Process and Public Participation L-1

Table of Figures

Figure ES - 1. Central Valley Hydrologic Regions and Surrounding Geography 7
Figure ES - 2. DWR Bulletin 118 Groundwater Basin and Extent of the Corcoran Clay in the Central Valley Floor 8
Figure ES - 3. Salt and Nitrate Management Strategy 13

Figure 1 - 1. Salt and Nitrate Management Strategy 132

Figure 2 - 1. Map of Hydrologic Regions Within the Central Valley Water Board Jurisdiction ..140
Figure 2 - 2. Sacramento Valley and San Joaquin Valley Water Year Type for 1977-2015 141
Figure 2 - 3. Central Valley Groundwater Basin Boundaries, Defined by DWR Bulletin 1 142
Figure 2 - 4. Schematic of Aquifer System (Where Corcoran Clay Absent) 157
Figure 2 - 5. Schematic of Aquifer System (Where Corcoran Clay Layer Present) 157
Figure 2 - 6. Extent of the Corcoran Clay in the Central Valley Floor 159
Figure 2 - 7. Ambient Groundwater Quality for Production Zone (TDS) mg/L 160
Figure 2 - 8. Ambient Conditions for Nitrate (mg/L as N) in the Upper Zone of Groundwater Basins/Subbasins in the Central Valley Floor 161
Figure 2 - 9. Central Valley Surface Water Flows 174
Figure 2 - 10. Bar Graph of Managed/Unmanaged Salt 175

Figure 4 - 1. CV-SALTS Organizational Structure 193
Figure 4 - 2. Salt and Nitrate Management Strategy 200
Figure 4 - 3. Salt Control Program Pathways to Compliance 206
Figure 4 - 4. General Schedule of Key Phase I Prioritization and Optimization Study Activities and Milestones 218
Figure 4 - 5. Prioritized DWR Bulletin 118 Groundwater Basins/Subbasins 227
Figure 4 - 6. Nitrate Permitting Strategy 231
Figure 4 - 7. Illustration of SNMP Surveillance and Monitoring that Relies on Existing Monitoring Program Data 266
Figure 4 - 8. Schematic of Aquifer System Within Corcoran Clay Extent[1] 274
Figure 4 - 9. Range in Particle Size Distribution Under Alternative Filtration Techniques 315

Table of Tables

Table ES - 1. Description of Major Components of the Proposed Salt and Nitrate Control Program 13

Table 1 - 1. Description of Major Components of the Proposed Salt and Nitrate Control Program 133

Table 2 - 1. Sacramento-San Joaquin Delta Inflows and Outflows. 146
Table 2 - 2. CV-SALTS Technical Studies Completed to Satisfy Specific Recycled Water Policy SNMP Requirements for the Evaluation of Salt and Nitrate 147
Table 2 - 3. Summary of EC and Nitrate (as N) Water Quality Conditions in Surface Waters in the Central Valley Region 148
Table 2 - 4. Clean Water Act Section 303(d) Listings for Salinity-related Parameters and Constituents with Secondary MCLs in the Sacramento River Hydrologic Region 151
Table 2 - 5. Clean Water Act Section 303(d) Listings for Salinity-related Parameters and Constituents with Secondary MCLs in the San Joaquin River Hydrologic Region 151
Table 2 - 6. Clean Water Act Section 303(d) Listings for Salinity-related Parameters and Constituents with Secondary MCLs in the Tulare Lake Hydrologic Region 153
Table 2 - 7. Clean Water Act Section 303(d) Listings for Salinity-related Parameters and Metals with Secondary MCLs in the Delta Region Associated with Municipal and Domestic Supply (MUN) and Agricultural (AGR) Beneficial Use Impairments 154
Table 2 - 8. Secondary Maximum Contaminant Levels (Consumer Acceptance Contaminant Levels) in California Code of Regulations Table 64449-A 163
Table 2 - 9. Secondary Maximum Contaminant Levels (Consumer Acceptance Contaminant Levels) in California Code of Regulations Table 64449-B 163
Table 2 - 10. Salt Water Quality Objectives at Vernalis and Boron Water Quality Objectives for the Lower San Joaquin River Between the Mouth of the Merced River and Vernalis 166
Table 2 - 11. LSJR Reach 83 WQOs and Performance Goal (PG) for Seasonal and Water Year Considerations (µS/cm) during Non-Extended Dry Periods. 167
Table 2 - 12. Concept Level Costs for Pump and Treat for Various Scenarios 176
Table 2 - 13. Summary of Dinuba Design Area Extraction/Injection Simulation Results 178
Table 2 - 14. Summary of Cutler/Orosi Design Area Extraction/Injection Simulation Results 178

Table 3 - 1 Basin Plan Amendment Approval Requirements 181

Table 4 - 1. Regulatory and Technical Studies to Support CV-SALTS SNMP Development and Implementation. 195
Table 4 - 2. CV-SALTS Technical Studies Completed to Satisfy Specific Recycled Water Policy SNMP Requirements for Evaluation of Salt and Nitrate 196
Table 4 - 3. Comparison Between the Conservative and Alternative Salinity Permitting Approaches During Phase I 205
Table 4 - 4. Key Phase I Prioritization and Optimization Study Milestones 213
Table 4 - 5. Evaluation of Salt Control Program Alternatives 219
Table 4 - 6. Prioritized DWR Bulletin 118 Groundwater Basins/Subbasins 228
Table 4 - 7. Timeline for Issuance of Notice to Comply with Nitrate Control Program 229

Table 4 - 8. Nitrate Discharge Categories 234
Table 4 - 9. Characteristics, Intent and Purpose of a Management Zone 235
Table 4 - 10. Pathway A, Summary Schedule for Implementation 236
Table 4 - 11. Pathway B, Summary Schedule for Implementation 237
Table 4 - 12. Evaluation of Nitrate Control Program Alternatives 255
Table 4 - 13. Comparison Nitrate Control Program Alternatives 2 and 3 255

Table 5 - 1. Categories of Discharge Quality and Impact to Groundwater 335

Table 8 - 1. Community Water System Estimated Costs for the AID Area Using Different Treatment Technologies for Nitrate Removal (Adapted from CDM Smith 2016a) 380
Table 8 - 2. Point-of-Use Treatment System Estimated Costs for the AID Area 380
Table 8 - 3. Estimated Capital and O&M Costs for Long-Term Nitrate Management in Entire AID Area Based on Restoration Plan B 382
Table 8 - 4. Estimates of the Number of Wells and Area Requiring Treatment in the AID Area and Projections for the Central Valley 383
Table 8 - 5. Estimated Capital and O&M Costs for Long-Term Nitrate Management in the Central Valley Based on Restoration Plan B 384
Table 8 - 6. Estimated Central Valley Regulated Brine Line Costs (Adapted from CDM Smith 2014) 386
Table 8 - 7. Estimated Annual Costs for Agriculture to Comply with the Salt Control Program 394
Table 8 - 8. Estimated Annual Costs for Agriculture to Comply with the Nitrate Control Program 395
Table 8 - 9. Estimated Annual Costs for Agriculture to Comply with the Surveillance and Monitoring Program 395
Table 8 - 10. Summary Totals and Costs to Agriculture 396

LIST OF ACRONYMS

Acronym/ Abbreviation	Definition
ACP	Alternative Compliance Project
AF	Acre-Feet
AFY	Acre-Feet/Year
AGR	Agricultural Supply
AID	Alta Irrigation District
APU	Administrative Procedures Update
AWQ	Ambient Water Quality
Basin Plans (BP)	Water Quality Control Plan for the Sacramento River and San Joaquin River Basins and the Water Quality Control Plan for the Tulare Lake Basin
BATEA	Best Available Technology Economically Achievable
BCT	Best Conventional Pollution Control Technology
BMP	Best Management Practice
Board	Central Valley Regional Water Quality Control Board
BOD	Biological Oxygen Demand
BPA	Basin Plan Amendment
BPT	Best Practicable Control Technology
BPTC	Best Practicable Treatment or Control
CAFO	Confined Animal Feeding Operation
CASGEM	California Statewide Groundwater Elevation Monitoring
CCR	California Code of Regulations
CDPH	California Department of Public Health
CEC	Constituents of Emerging Concern
CEDEN	California Environmental Data Exchange Network
Central Valley Water Board	Central Valley Regional Water Quality Control Board
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CVHM	Central Valley Hydrologic Model
CVP	Central Valley Project
CVRWQCB	Central Valley Regional Water Quality Control Board
CV-SALTS	Central Valley Salinity Alternatives for Long-Term Sustainability
CVSC	Central Valley Salinity Coalition

Acronym/ Abbreviation	Definition
CWA	Clean Water Act
DDW	Division of Drinking Water
Delta	Sacramento-San Joaquin Delta
DMC	Delta Mendota Canal
DWR	California Department of Water Resources
EAP	Early Action Plan
EBMUD	East Bay Municipal Utility District
EC	Electrical Conductivity
EIR	Environmental Impact Report
ELG	Effluent Limitation Guideline
ESA	Endangered Species Act
FDS	Fixed Dissolved Solids
GAMA	Groundwater Ambient Monitoring and Assessment
GAR	Groundwater Quality Assessment Reports
GMP	Groundwater Management Plan
gpm	Gallons per Minute
GQMP	Groundwater Quality Management Plan
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
GW	Groundwater
HASP	Health and Safety Plan
IAZ	Initial Analysis Zone
ICM	Initial Conceptual Model
IGP	Industrial General Permit
ILRP	Irrigated Lands Regulatory Program
IRWMP	Integrated Regional Water Management Plan
IX	Ion Exchange
LAA	Land Application Area
LMUN	Limited Municipal and Domestic Water Supply
LSCE	Luhdorff & Scalmanini Consulting Engineers
LSJR	Lower San Joaquin River
LWA	Larry Walker Associates
MAF	Million acre feet
MCL	Maximum Contaminant Level
MEP	Maximum Extent Practicable

Acronym/ Abbreviation	Definition
MGD	Million Gallons/Day
mg/L	Milligrams/liter
mmhos/cm	Micromhos per centimeter
MS4	Municipal Separate Storm Sewer System
MUN	Municipal and Domestic Water Supply
MZ	Management Zone
N	Nitrogen
NIMS	Nitrate Implementation Measures Study
NOI	Notice of Intent
NO3-N	Nitrate as Nitrogen
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Unit
NUE	Nitrogen Use Efficiencies
NWIS	National Water Information System
O & M	Operations and Maintenance
OWTS	Onsite Wastewater Treatment System
P & O Study	Prioritization & Optimization Study
POTW	Publicly Owned Treatment Works
POU	Point of Use
PTS	Pump, Treat and Serve
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
Regional Water Boards	Regional Water Quality Control Boards
RMP	Representative Monitoring Program
RO	Reverse Osmosis
SAMP	Surveillance and Monitoring Program
SAP	Sample Analysis Plan
SC	Specific Conductance
SED	Substitute Environmental Document
SEMP	Salinity Evaluation and Minimization Plan
SGMA	Sustainable Groundwater Management Act
SIP	State Implementation Policy
SMCL	Secondary Maximum Contaminant Level
SNMP	Salt and Nitrate Management Plan

Acronym/ Abbreviation	Definition
Sq. mi.	Square Miles
SRSJR	Sacramento River/San Joaquin River
SSALTS	Strategic Salt Accumulation Land and Transportation Study
SSO	Site Specific Objective
SWP	State Water Project
SWQMP	Surface Water Quality Management Plan
State Water Board	State Water Resources Control Board
TAC	Technical Advisory Committee
TAF	Thousand acre feet
TBEL	Technology Based Effluent Limit
TDS	Total Dissolved Solids
TLB	Tulare Lake Basin
TMDL	Total Maximum Daily Load
TSS	Total Suspended Solids
µmhos/cm	micromhos/centimeter
µS/cm	microsiemens/centimeter
USC	United States Code
US EPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UTS	Under the Sink
UWMP Act	Urban Water Management Planning Act
WARMF	Watershed Analysis Risk Management Framework
Wat. Code	California Water Code
WBD	Watershed Boundary Dataset
WBS	Water Balance Subregions
WDL	Water Data Library
WDR	Waste Discharge Requirement
WLA	Waste Load Allocation
WQ	Water Quality
WQBEL	Water Quality-based Effluent Limitations
WQO	Water Quality Objective
WQP	Water Quality Portal
WTP	Water Treatment Plant
WWTP	Waste Water Treatment Plant
WY	Water Year

1 INTRODUCTION

California's Central Valley is one of the most productive agricultural regions in the world and is home to almost 20% of California's population (estimated at over 38 million in 2015). By 2030, the state population is expected to increase by more than 13% to over 44 million people and by 2050, the population is expected to be close to 50 million people. This steady growth will put significant, increased demands on state and regional water resources (Central Valley Water Board, 2010). Communities in the Central Valley rely on surface and groundwater for many beneficial uses, including agriculture and drinking water supplies. However, elevated salt and nitrate concentrations in portions of the Central Valley impair or threaten to impair the region's water and soil quality which, in turn, adversely affects agricultural productivity and/or drinking water supplies. An economic study completed in 2009, projected that if salt management did not change, direct economic costs would exceed $1.5-billion/year within the Central Valley by 2030 (Howitt, et al., 2009).

In 2006, the State Water Resources Control Board and Central Valley Regional Water Quality Control Board (Central Valley Water Board) held a public forum to discuss the salinity conditions and concerns and initiated a stakeholder lead process to develop recommendations for a salinity management plan for the Central Valley. The stakeholder lead process transitioned over time into the Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) initiative and in addition to salt, developed recommendations for a Central Valley-wide nitrate management strategy to ensure safe drinking water supplies. Stakeholder membership included representatives from agriculture, municipalities, industry, water supply, environmental justice, state and federal regulatory agencies, and the public.

CV-SALTS was tasked with developing an environmentally and economically sustainable Salt and Nitrate Management Plan (SNMP) for the entirety of the Central Valley Regional Water Quality Control Board's (Central Valley Water Board or Board) jurisdictional area. In December 2016, CV-SALTS completed the SNMP (CV-SALTS, 2016). The CV-SALTS SNMP builds on a range of water quality management policies and mechanisms already in existence, proposes additional policies and tools needed to provide the Central Valley Water Board with flexibility in addressing legacy and ongoing loading of salt and nitrate in the diverse region, and presents a comprehensive regulatory and programmatic approach for the sustainable management of salts and nitrate in groundwater and surface water. The SNMP was developed to achieve the following management goals:

- Sustain the Valley's lifestyle
- Support regional economic growth
- Retain a world-class agricultural economy
- Maintain a reliable, high-quality water supply
- Protect and enhance the environment

Although broader in overall scope, the SNMP was also developed to meet requirements set forth in the State Water Resources Control Board (State Water Board) Recycled Water Policy. The Recycled Water Policy provides statewide direction regarding the appropriate criteria to be used when issuing permits for recycled water projects. In addition, the Recycled Water Policy articulates the State Water Board's policy that every groundwater basin/sub-basin in California needs to have an effective salt and nutrient management plan. To ensure that such plans were developed in a timely manner, the Recycled Water Policy establishes criteria and timelines for their development. One of the overarching goals of the Recycled Water Policy is to develop salt and nutrient management plans (for groundwater basins or sub-basins) that

are sustainable on a long-term basis and to provide California with clean, abundant, local water.

In order to address the requirements of the Recycled Water Policy and also address legacy and ongoing salt and nitrate accumulation concerns, the SNMP is built on achieving the following prioritized Central Valley Region management goals for salt and nitrate:

- Goal 1: Ensure a safe drinking water supply.
- Goal 2: Achieve balanced salt and nitrate loadings, where reasonable, feasible and practicable.
- Goal 3: Implement managed aquifer restoration program, where reasonable, feasible, and practicable.

These management goals recognize the need to focus limited resources first on health risks associated with unsafe drinking water. Subsequent, but important, goals that will require longer implementation timelines include balancing salt and nitrate loading and restoring water quality, where reasonable and feasible. Throughout the process, it was recognized that to successfully achieve all three goals, stakeholders within the Central Valley as well as those that utilize water from the Central Valley would need to collaborate. Diverse activities from source control of individual and classes of discharges to stormwater capture and use to support and encourage water conservation, conjunctive use of surface and groundwater, and improve local water supplies and groundwater quality, would needed to be blended into the overall strategy.

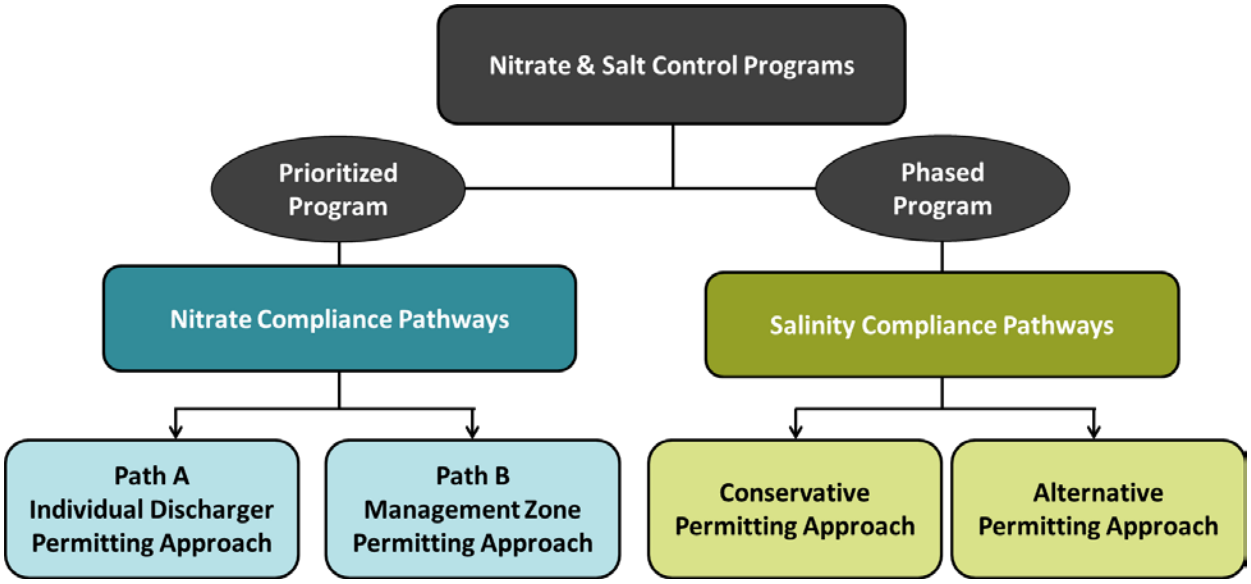
In January 2017, CV-SALTS provided their recommended Central Valley Salt and Nitrate Management Plan (SNMP) to the Central Valley Water Board and staff were directed to utilize the recommendations as appropriate and develop amendments to the Water Quality Control Plans for the Sacramento and San Joaquin River Basins and for the Tulare Lake Basin (Basin Plans) to incorporate a sustainable Salt and Nitrate Control Program that prioritized safe drinking water supplies and led to long-term, managed restoration of impaired water bodies, where reasonable, feasible and practicable.

This staff report provides the rationale and supporting documentation for those proposed amendments utilizing in part technical work completed under the CV-SALTS initiative that evaluated: current conditions and trends in water quality; beneficial use sensitivity to salt and nitrate concentrations; effectiveness and costs of various treatment alternatives and management practices; and potential approaches to address existing concerns as demonstrated by case studies. The proposed amendments include a phased salt control strategy, a prioritized nitrate control strategy with specific implementation activities required for salt and another set of implementation activities required for nitrate. Both implementation approaches provide dischargers the option to select their means of compliance: either through a conservative permitting approach focused on individual source control or through an alternative coordinated, multi-discharger management approach (Figure 1-1).

The Salt and Nitrate Control Program is implemented through a combination of Central Valley Water Board authorities. First, to ensure timely implementation, a Conditional Discharge Prohibition has been established in the Basin Plans that will require that certain permittees begin to implement provisions of the Control Program upon receiving a Notice to Comply issued by the Board's Executive Officer. The Conditional Discharge Prohibition will assist in establishing enforceable conditions until the Board revises permits to incorporate applicable requirements from the Control Program or determines that existing permit requirements are adequate. Second, for certain other permittees subject to General Orders, the Board will hold a hearing to consider amending such Orders within 18 months of the effective date of the Salt and

Nitrate Control Program to incorporate timelines and milestones for complying with the Control Program. Long-term implementation of the Salt and Nitrate Control Program is achieved primarily through the Board's permitting actions (i.e., waste discharge requirements or conditional waivers); however, to be successful, coordination, funding and support will be required from multiple state, federal and local agencies as well as from local stakeholders and those benefitting from Central Valley waters.

Figure 1 - 1. Salt and Nitrate Management Strategy



The following list identifies the major components of the Salt and Nitrate Control Program and policies that support its implementation:

- Salt Control Program (Discharges to Surface and Groundwater)
- Nitrate Control Program (Discharges to Groundwater)
    - Prioritized Groundwater Basins
    - Management Zones
- Conditional Prohibition
- Surveillance and Monitoring
- Policies to Support Implementation
    - Variance Policy
    - Exception Policy
    - Drought/Conservation
    - Offsets Policy
    - Application of Secondary Maximum Contaminant Levels to Protect MUN

Each component is summarized in Table 1-1.

Table 1 - 1. Description of Major Components of the Proposed Salt and Nitrate Control Program

Component	Description
Salt Control Program	The Salt Control Program recommends a process for moving forward with a three-phased long-term salinity management program. Each phase is anticipated to have a duration of 10-15 years. • Phase I: Salinity Prioritization and Optimization Study (P&O Study) to convert current conceptual management projects into feasibility studies • Phase II: Project Development and Acquisition of Funds • Phase III: Project Implementation/Construction of Physical Project (e.g. salt management areas; treatment facilities; regulated brine line) Phase I includes adoption of a proposed Interim Salinity Permitting Approach for permittees who discharge salt whereby they may select to be regulated under conservative, source control limits or opt into participating in the funding and development of the P&O Study. A third party entity made up of a coalition of regulated dischargers and other entities will manage and fund the P&O Study. Timelines and milestones are identified.
Prioritized Groundwater Basins for Nitrate Control Program Implementation	Scores were assigned to one square mile grids based on the ambient nitrate as nitrogen concentration in the Upper Zone, for each basin identified in the Central Valley Hydrologic Unit Model (Faunt, 2009). Based on the aggregate score within the basin boundaries, the basins were prioritized for implementation of the Nitrate Control Program. Permitted dischargers to groundwater within Priority 1 basins will be notified within one year of the effective date of the amendments of their need to comply with the Nitrate Control Program. Permittees in Priority 2 basins will receive notification within two to four years of the effective date. The remaining basins will be prioritized at the discretion of the Central Valley Water Board. The Central Valley Water Board will review the priorities no later than 1 January 2024 after considering water quality-based factors and other relevant information. Nothing in the program prevents interested parties from providing additional information and requesting a review of an area's priority.
Groundwater Management Zone Strategy (Nitrate Specific)	The Nitrate Control Program recommends that the Basin Plans be amended to allow and encourage management of nitrate through the establishment of Management Zones. In general, a Management Zone would consist of multiple permittees and other local stakeholders working collectively to first ensure safe drinking water, then to manage nitrates to create a balance within the defined management area (where reasonable and feasible), and ultimately to develop and implement a long-term plan for restoration of groundwater (where reasonable, feasible and practicable) to meet applicable water quality objectives. Although the Basin Plans do not currently prevent the management of nitrates through the creation of Management Zones, the Program defines the characteristics, intent and purpose of a Management Zone as well required components for consideration of approval by the Central Valley Water Board.
Nitrate Control Program	The Nitrate Control Program provides two pathways for compliance for permitted discharges to groundwater. Pathway A is for individual permittees and sets conservative limitations for source control. Requirements are based on categories that take into account nitrate concentrations in the discharge as well as in the Shallow Zone of the aquifer. Pathway B is for permittees proposing to be regulated under a Management Zone. Both Pathways have their own specific milestones and timelines. However, both Pathways require the development of an Early Action Plan (EAP) to identify means of providing short term safe drinking water supplies to users impacted by nitrate concentrations in their groundwater source which falls within the permittee's zone of contribution. When needed, both Pathways also require development of an alternate compliance project to allow continued discharge into a threatened or impaired groundwater basin while the permittee develops a long-term solution to ensure safe drinking water and move toward balanced loading and restoration. The Control Program includes guidance on the minimum requirements for an alternative compliance project which relies in part on the Conditional Exceptions Policy (discussed below).

Table 1 - 1. Description of Major Components of the Proposed Salt and Nitrate Control Program

Component	Description
Conditional Prohibition	A Conditional Prohibition will apply to all permittees discharging salt or nitrate, except permittees regulated under the Board's Irrigated Lands Regulatory Program (ILRP) and potentially other General Orders, from the time the permittee receives a Notice to Comply until such time that the permittees' existing waste discharge requirements are updated or amended through a public hearing to reflect requirements of the Salt and Nitrate Control Program, including incorporation of any proposed Alternate Compliance Project or Management Zone Implementation Plan. The Central Valley Water Board will consider updating ILRP General Orders within 18 months of the effective date of the amendments. Conditions will include meeting Control Program requirements including meeting timelines for response to Notice to Comply, selection of permitting pathway, submittal of justification for pathway selection, implementation of Early Action Plans when needed, and submittal of any needed Alternate Compliance Project or Management Zone Proposal and associated Implementation Plan.
Surveillance and Monitoring	The goals of the Salt and Nitrate Monitoring Program are to: assess the effectiveness of the Control Program; develop statistically-representative ambient water quality determinations and trends; and maximize the use of existing monitoring programs. Information gathered will be consolidated and evaluated by the entity leading the monitoring study. Within two years of the effective date of the Salt and Nitrate Control Program, the lead entity will submit a Work Plan and a Quality Assurance Project Plan for Central Valley Water Board approval. Permittees with salt or nitrate discharges must either gather needed information required by the plan for their area of contribution and provide the information to the lead entity in a readily available format or must demonstrate their support for the lead entity to gather needed information by submitting documentation of such support from the lead entity. An assessment of ambient water quality and trends and a review of the overall progress of the Salt and Nitrate Control Program based on water quality trends will be completed at least once every 5-years or other time schedule approved by the Central Valley Water Board.
Variance Policy	The existing conditional Salinity Variance Program applies to salinity water quality standards for the following constituents: electrical conductivity, total dissolved solids, chloride, sulfate and sodium, and was developed to allow permittees to continue to meet performance based standards while supporting the CV-SALTS initiative. The current Salinity Variance Program prohibits the Central Valley Water Board from approving any salinity variance after June 30, 2019, because it was intended that any extension, or permanent, long-term Salinity Variance Program should be developed through the CV-SALTS process and that stakeholders needed to make appropriate recommendations for such a policy in the SNMP. The Salt and Nitrate Control Program recommends that the Salinity Variance Program be extended for an additional 15 years to allow permittees to participate in the P&O Study. Permittees who do not participate in the P&O Study are not eligible for a salinity variance.
Exceptions Policy	The existing Salinity Exceptions Policy that only applies to TDS/EC, chloride, sulfate and sodium, prohibits the Central Valley Water Board from authorizing new exceptions or reauthorizing previously approved exceptions after June 30, 2019. This Salt and Nitrate Control Program recommends revising the existing Exceptions Policy by amending the Basin Plans to (a) add nitrate to the list of chemical constituents for which the Central Valley Water Board may authorize an exception; (b) expand/revise conditions or authorization of an exception to reflect the requirements of the Salt and Nitrate Control Program (no separate application for an exception is needed if meeting Phase I Alternative Salinity Compliance provisions and implementation of an approved alternate nitrate compliance project, respectively); (c) remove the existing sunset provision that prohibits the granting of exceptions beyond June 30, 2019; and (d) delete the current provision limiting the term of an exception to no more than 10 years and add a new provision stating that when authorizing an exception, the Central Valley Water Board shall generally not exceed a term of 10-years and may only exceed 50-years if management practices under the exception are resulting in significant, measurable and continuing improvements in water quality. Exception application provisions specific to boron are also included.

Table 1 - 1. Description of Major Components of the Proposed Salt and Nitrate Control Program

Component	Description
Drought and Water Conservation Policy	The effects of drought and the implementation of encouraged or mandated water conservation practices can significantly impact effluent quality in discharges to surface water or groundwater and compliance issues for some permittees because of increased TDS/EC and other salinity-related constituents in influent and effluent. Historically, WDRs/Conditional Waivers rarely have included any special provision or consideration for variations in effluent quality, directly or indirectly related to recurrent drought conditions that are beyond the control of the permittee or for ongoing, expanding and sometimes mandated conservation practices. The Salt and Nitrate Control Program proposes interim salinity effluent limits during periods of drought or increased implementation of water conservation practices. During periods of drought the interim effluent limit for electrical conductivity (EC) is not to exceed 2,200 uS/cm as a 30-day running average. The limits may be established in terms of concentration or total dissolved solids (TDS) loading. Interim limits for conservation efforts shall be based on either not exceeding the receiving water concentration and not causing down gradient impacts or maintaining TDS loading consistent with historical load (with consideration given to reasonable increment of use or change in source water salinity concentration) while not exceeding the numeric limitations noted above. The Drought and Conservation Policy is proposed to guide interim effluent limits as needed under the Variance Policy during Phase 1 of the Salt Control Program and may become generally applicable during future phases based upon review of the overall program.
Offsets Policy	An offset is an alternative means of achieving compliance with a WDR, either alone or in combination with other actions, for a given pollutant or pollutants. An offset allows for the management of other sources and loads (not directly associated with the regulated discharge) so that the combined net effect on receiving water quality from the discharge and the offset is functionally-equivalent to or better than that which would have occurred by requiring the permittee to comply with its WDR at the point-of-discharge. The Salt and Nitrate Control Program includes an Offsets Policy, which recommends that the Basin Plans be amended to provide authority for the Central Valley Water Board to allow the use of offset projects to comply with WDRs, but only for groundwater. In general, offsets are to be utilized in the same groundwater basin/sub-basin where the discharge occurs, however, offsets may also be used to incentivize implementation of some large-scale projects such as a regional regulated brine line. Offsets may be proposed to support a request for either an allocation of available assimilative capacity or an exception but cannot result in unmitigated localized impairments. Offsets must be (1) proposed by permittee (individual or group of permittees) as an Alternative Compliance Project (ACP, see below); (2) approved by the Central Valley Water Board; and (3) enforceable through a WDR or other orders issued by the Board. The approved offset must specify the time period for which it applies, a monitoring and reporting program, and remedial actions that must be undertaken by the permittee if the offset project fails.

Table 1 - 1. Description of Major Components of the Proposed Salt and Nitrate Control Program

Component	Description
Clarified Water Quality Objectives and Guidance to Implement Secondary Maximum Contaminant Levels to Protect MUN	The Salt and Nitrate Control Program proposes to incorporate guidance into the Basin Plans to clarify implementation of SMCLs (Title 22) in permits for discharge to surface water and groundwater. These recommendations include: ▪ Under Chapter 3 Water Quality Objectives: incorporate guidance from Title 22 for utilizing the applicable "Recommended", "Upper", or "Short Term" concentrations included in Table 64449-B; clarify consideration of natural background concentrations; and specify annual averaging for surface water and appropriate long-term averaging for groundwater. ▪ Under Chapter 4 Implementation: • Consider "Recommended" concentrations as goals and allow concentrations ranging to the "Upper" level if it is demonstrated that it is neither reasonable nor feasible to achieve lower levels. "Short Term" level may be authorized on a temporary basis consistent with Title 22 or with the Drought and Conservation Policy • Clarify the use of filtered samples using a 1.5-micron filter to remove suspended solids to measure compliance for aluminum, color, copper, iron, manganese, silver, turbidity and zinc.. • The Central Valley Water Board may adjust the filter size where necessary to more accurately represent site-specific conditions based on scientific evidence submitted for their consideration and after consultation with Division of Drinking Water and public comment.
Guidance for Developing Alternative Compliance Projects (ACP) for Nitrate Discharges	When an individual or group of permittees is unable to demonstrate that their discharge is not individually or collectively causing nitrate degradation above the triggers identified in the Nitrate Control Program, they have an opportunity to request either allocation of available assimilative capacity or an exception. In most cases, the request for the granting of assimilative capacity[28] or an exception in these circumstances requires submittal of a proposed ACP. This request may be made as an individual permittee (which includes a third party group subject to a general order) or permittees working collaboratively as part of a groundwater management zone. Any proposed ACPs submitted for consideration must contain specific components; accordingly, guidance is provided that describes the components recommended for submittal of an ACP for approval. At a minimum any proposed ACP must include but is not limited to: • Identification of public water supply and domestic wells within the discharge area zone of contribution that exceed nitrate water quality objectives • Milestones and timelines to address the drinking water issues (short and long-term) • Milestones and timelines to meet long term management goals of balanced loading and restoration, which may be phased over time
SMCL Considerations when Developing WDRs	Source water protection is a critical component to protect drinking water consumers. Since clarifications are proposed to address the application of SMCLs to protect MUN, guidance is also proposed on considerations when evaluating permit conditions related to SMCLs in order to clarify the current process of evaluating potential individual and cumulative impacts on instream and downstream beneficial uses.

[28] Conditions with respect to granting of assimilative capacity will vary, depending on how the receiving water is defined for the discharge(s) in question. In some cases, the receiving water will be considered to be shallow groundwater, while in others, it may be the upper zone.

Table 1 - 1. Description of Major Components of the Proposed Salt and Nitrate Control Program

Component	Description
Definitions Specific to Salt and Nitrate Control Program	A series of definitions have been proposed for incorporation as part of the Salt and Nitrate Control Program amendment in order to add clarity and provide consistency in implementation.

The proposed amendments provide the regulatory authority to sustainable manage salt and nitrate within the Central Valley while ensuring safe drinking water supplies and moving toward long-term, managed restoration of groundwater basins, where reasonable, feasible and practicable. The proposed amendments do not remove any existing authorities of the Central Valley Water Board, which may use its discretion whether a discharge needs more prescriptive regulation. The proposed Salt and Nitrate Control Program is designed to address both legacy and ongoing salt and nitrate accumulation issues in surface and groundwater for salt and groundwater for nitrate; however, the primary focus of early actions (first ten years) is on groundwater quality and in particular nitrate impacts to drinking water supplies.

This report is focused on the public process utilized, project alternatives that were developed, selection of the preferred alternative, consistency of those alternatives with State and Federal laws, plans and policies, and the results of California Environmental Quality Act (CEQA), antidegradation, and economic evaluations of the preferred alternatives. Appendices have been included to summarize background water quality conditions, current regulatory framework, guidelines and considerations when utilizing various components of the proposed amendments, and examples of intent for the Salt Control Program and Nitrate Control Program, in addition to the environmental checklist.

1.1 Purpose and Function of this Document

Implementation of the Salt and Nitrate Control Program and related policies will occur through adoption, by the Central Valley Water Board, of amendments to the *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins* and the *Water Quality Control Plan for the Tulare Lake Basin* (Basin Plans). The Central Valley Water Board amends its Basin Plans through a structured process involving peer review (as necessary), public participation, and environmental review. The Board must comply with the California Environmental Quality Act (CEQA) (Pub. Res. Code, § 21000 et seq.) when amending its Basin Plans. However, the Secretary of Natural Resources has certified the Board's basin planning process as exempt from the CEQA requirement to prepare an environmental impact report because a sufficiently rigorous environmental review is incorporated into the basin planning process itself. (Pub. Res. Code, § 21080.5.; Cal. Code Regs., tit.14, § 15251(g).) Before adopting amendments to the Basin Plans, the Board prepares and circulates substitute environmental documentation or an "SED", rather than an environmental impact report. In the SED, the Board analyzes any potential adverse environmental effects associated with the proposed amendment(s). This document was prepared to serve as part of the overall SED for adoption of the proposed Salt and Nitrate Control Program and components of related policies into the Basin Plans, and addresses the impacts associated with implementing the proposed Salt and Nitrate Control Program and related policies on the affected environment of the Central Valley.

1.2 SCOPE OF ASSESSMENT

The analysis in this staff report is a program level (i.e., macroscopic) analysis of environmental impacts. CEQA describes a program-level environmental analysis as one prepared for a series of actions that can be characterized as one large project and are related either (1) geographically, (2) as logical parts in the chain of contemplated actions, (3) in connection with issuance of rules, regulations, or plans, or (4) as individual activities carried out under the same authorizing statutory or regulatory authority and having generally similar environmental effects which can be mitigated in similar ways. (Cal. Code Regs., tit.14, § 15168.)

In accordance with Public Resources Code section 21159(a), this staff report does not engage in speculation or conjecture. This staff report identifies the reasonably foreseeable environmental impacts associated with the reasonably foreseeable actions to be implemented, based on information developed before, during, and after the CEQA Scoping Meeting. When the CEQA analysis identifies a potentially significant environmental impact, the accompanying analysis identifies reasonably foreseeable feasible mitigation measures. (Pub. Res. Code, § 21159(a)(2).)

Subsequent project-level environmental analyses will be performed, as required by CEQA, by the local agencies that will implement projects resulting from the Salt and Nitrate Control Program, by the Central Valley Water Board, or by other state agencies or departments. (Pub. Res. Code, §21159.2.) Notably, the Central Valley Water Board is prohibited from specifying the manner of compliance with its regulations (Wat. Code, § 13360.), and accordingly, the actual environmental impacts of specific projects will necessarily depend upon the compliance strategy selected by the local implementing agencies and other permittees. The environmental analysis of the Proposed Project presented in this staff report assumes that the permittees will design, install, and maintain projects following all applicable laws, regulations, ordinances, and formally adopted municipal and/or agency codes, standards, and practices.

2 ENVIRONMENTAL AND REGULATORY SETTING

This section discusses current environmental and regulatory conditions in the Central Valley related to salt and nitrate concentrations in surface waters and groundwater. The section is divided into discussions on: overall basin characteristics including current water quality concentrations in surface and groundwater; current regulatory framework governing discharges to surface waters and groundwater; and perceived limitations in regulatory authority to continue to permit discharges of salt and nitrate while ensuring safe drinking water supplies and addressing ongoing and legacy impacts to groundwater basins.

2.1 ENVIRONMENTAL SETTING

2.1.1 Basin Characteristics

The affected environment for the Salt and Nitrate Control Program is the jurisdictional area of the Central Valley Water Board. The Central Valley Region stretches from the Oregon border to the Kern County/Los Angeles County line. It is bounded by the Sierra Nevada Mountains on the east and the Coast Range on the west. Three distinct hydrologic regions comprise the Central Valley Region (California Department of Water Resources, 2013a) (California Department of Water Resources, 2013b) (California Department of Water Resources, 2013c).

- The northern third of the valley falls within the “Sacramento River Hydrologic Region” and is referred to as the Sacramento Valley.
- The southern two-thirds of the valley is referred to as the San Joaquin Valley, which contains two hydrologic regions:
    - The “San Joaquin River Hydrologic Region” in the north.
    - The “Tulare Lake Hydrologic Region” in the south.

The Delta is contained in and receives flows from both the Sacramento River and San Joaquin River hydrologic regions. The flows are then redistributed throughout California via federal and state water projects. Figure 2-1 shows the hydrologic region boundaries and location of the Delta as well as the area representing the “valley floor” within the Central Valley Water Board jurisdiction.

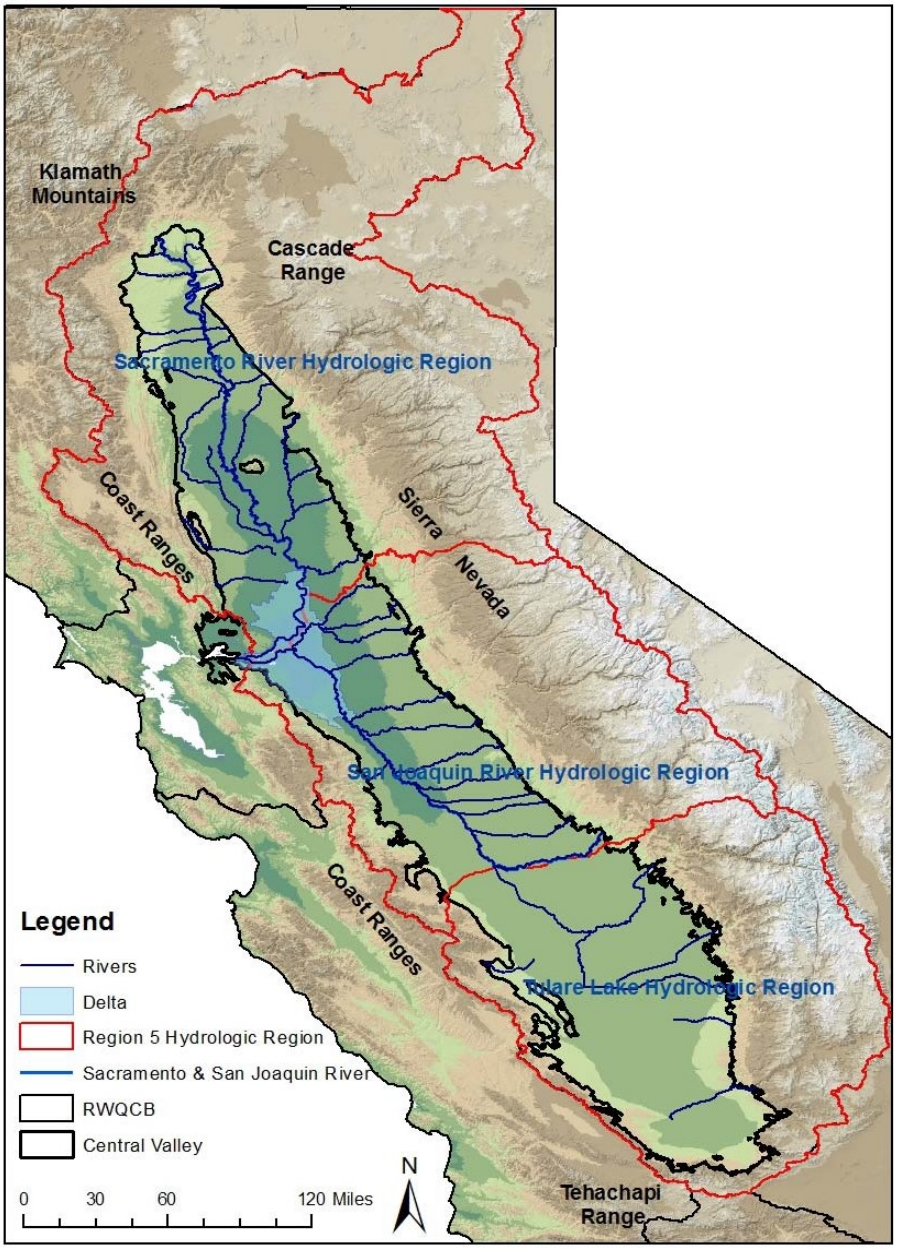
The Central Valley is generally characterized by a Mediterranean climate, though there is significant variation at various latitudes. Summers are long, hot, and dry throughout the region. In the region, roughly 85 percent of annual precipitation falls during November through April, with half of it falling in December through February in average years (Faunt, 2009). Snow falls at the higher elevations and tends to support year-round flows in water bodies at lower elevations as the snow melt is captured in dams and metered out during the year. Climate change is expected to result in more precipitation to fall as rain instead of snow and a faster rate of snow melt, which will alter surface water runoff and flow patterns in the future (California Department of Water Resources, 2013a).

The annual variability in precipitation within the Central Valley is reflected in the Sacramento Valley and San Joaquin Valley water year hydrologic classification indices (California Department of Water Resources, 2018). Water years are classified as wet, above normal, below normal, dry, or critical, based on measured unimpaired runoff in valley rivers, according to the

San Francisco Bay/Sacramento-San Joaquin Delta Water Quality Control Plan (State Water Board, 2006).

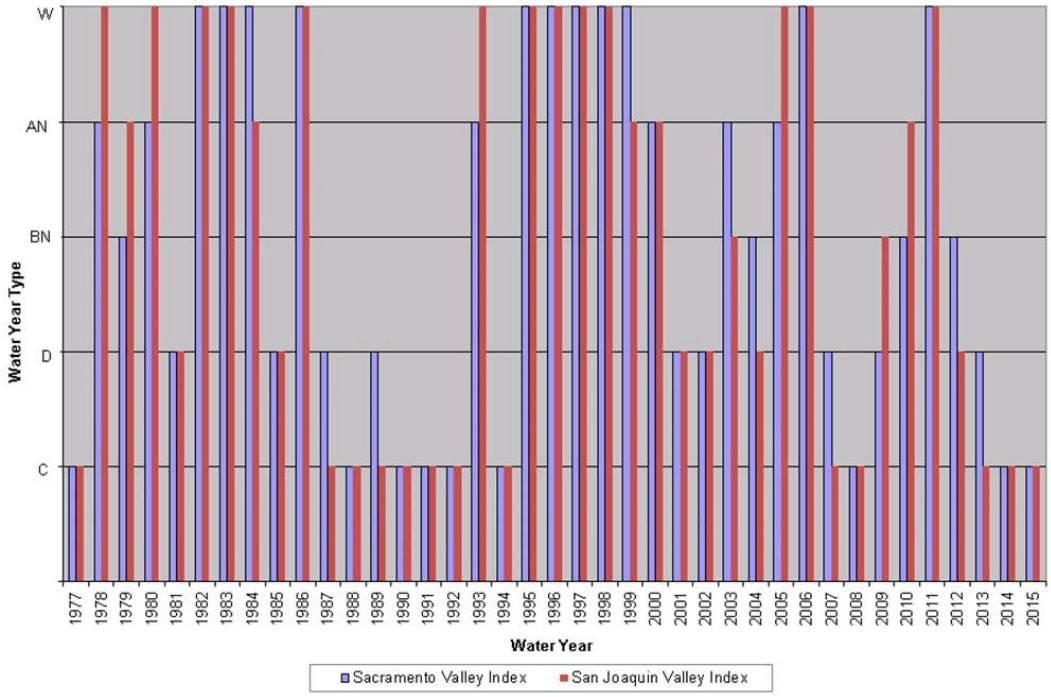
Figure 2-2 depicts water year types from 1977 through 2015, and shows that both valleys can experience extended periods with back-to-back dry and critical water years, such as from 1987–1992 and 2013–2015, as well as back-to-back wet periods, such as water years 1995–1999. Climate change is expected to result in more variable weather patterns and longer, more severe droughts (California Department of Water Resources, 2013a).

Figure 2 - 1. Map of Hydrologic Regions Within the Central Valley Water Board Jurisdiction



Source: CV-SALTS SNMP (2016)

Figure 2 - 2. Sacramento Valley and San Joaquin Valley Water Year Type for 1977-2015

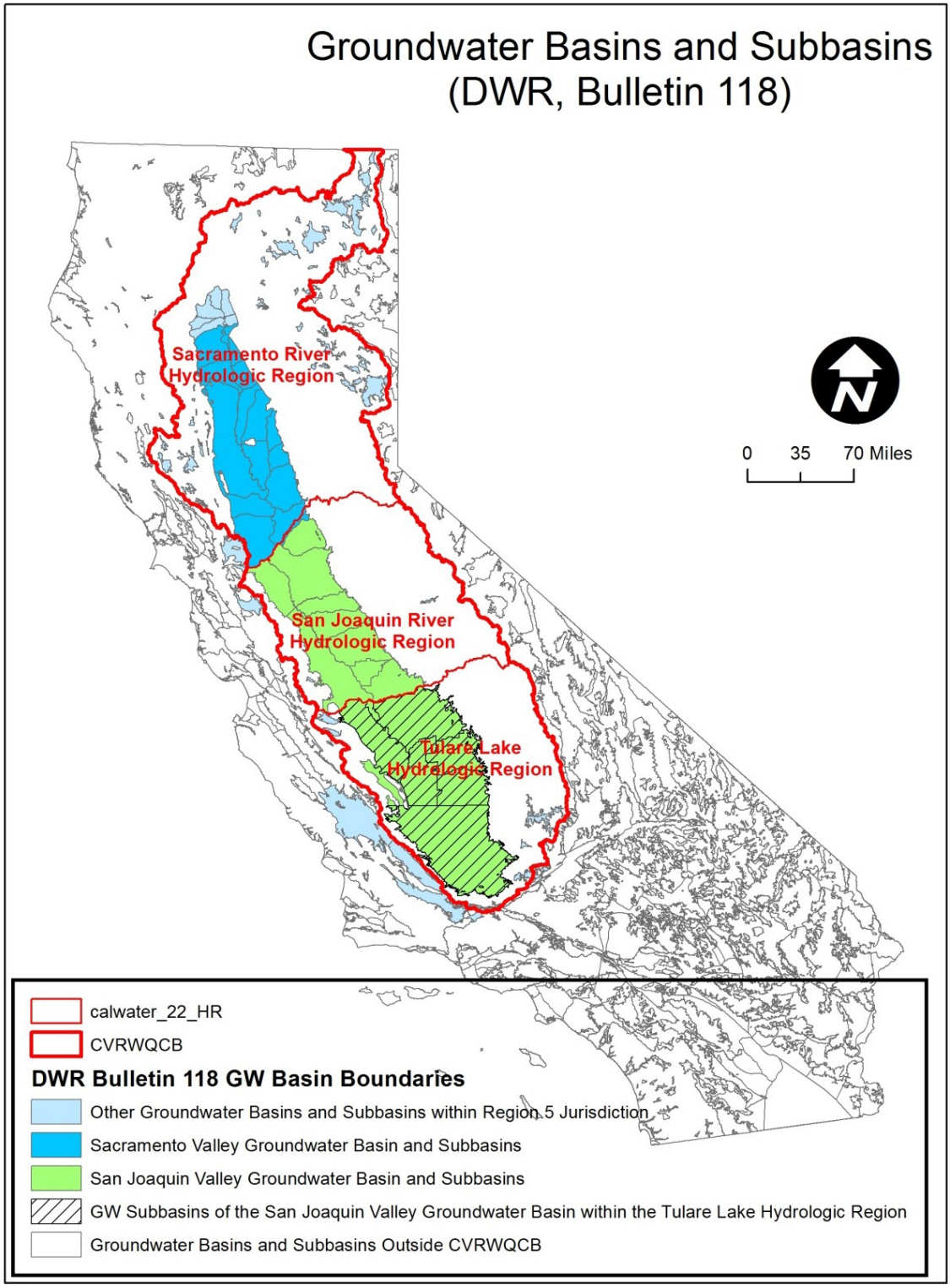


Notes: C = Critical; D = Dry; BN = Below Normal; AN = Above Normal; W = Wet
Source: California Data Exchange Center (http://cdec.water.ca.gov/cgi-progs/iodir/wsihist)

An extensive array of reservoirs, channels, aqueducts, and pumps form a network of managed surface water storage and delivery systems to supply both a portion of the water needed throughout the Central Valley as well as supply water needs throughout California. The Central Valley Project (CVP) and State Water Project (SWP) move water from the Sacramento River and San Joaquin River through the Delta for delivery to users in the San Joaquin Valley as well as to the South Bay, the Central Coast and Southern California. East Bay Municipal Utility District delivers water from the Mokelumne and Sacramento Rivers to customers in its service area. The Tuolumne River is a primary water supply for the City of San Francisco.

California's groundwater provides approximately 30 to 46 percent of the State's total water supply, depending on water year type (e.g., wet or dry), and serves as a critical buffer against drought and climate change (California Department of Water Resources, 2013b). Some communities in California are 100 percent reliant upon groundwater for urban and agricultural use (California Department of Water Resources, 2013b). Within the Central Valley Region, there are 86 groundwater basins and 126 groundwater sub-basins, as defined by DWR Bulletin 118 (California Department of Water Resources, 2003), which are shown in Figure 2-3. The two main basins within the region are the Sacramento Valley Groundwater Basin and San Joaquin Valley Groundwater Basin. The San Joaquin Valley Groundwater Basin includes sub-basins that lie within the Tulare Lake Hydrologic Region. The main source of groundwater in the Central Valley is typically located within the upper 1,000 feet of deposits that contain the groundwater. In some places, saline water is found at shallow depths in continental deposits, which can result from upward migration of connate water, evaporative concentration, or estuarine water trapped during sedimentation (Page, 1986).

Figure 2 - 3. Central Valley Groundwater Basin Boundaries, Defined by DWR Bulletin 1



Additional information regarding climate, watershed characteristics and hydrology specific to the three hydrologic regions and Delta is provided in the following sections.

SACRAMENTO RIVER HYDROLOGIC REGION

The Sacramento River Hydrologic Region covers approximately 27,200 square miles and includes the entire area drained by the Sacramento River. For Central Valley Water Board basin planning purposes, this region includes all watersheds tributary to the Sacramento River that are north of the Cosumnes River watershed. It also includes the closed basin of Goose Lake and drainage sub-basins of Cache and Putah Creeks. (Central Valley Water Board, 2016).

Climate

Precipitation in the Sacramento River Hydrologic Region generally decreases from north to south and east to west. The mountain regions to the north and the east experience cold, wet winters, with most precipitation falling as snow. The northernmost area is dominated by a high desert plateau and also receives the majority of precipitation as snow. (California Department of Water Resources, 2013a). Precipitation on the valley floor varies from an annual average of 34 inches in Redding to 17 inches in Sacramento (Western Regional Climate Center, 2018).

Land Cover and Land Uses

Of the Sacramento River Region's 27,200 square miles, 11 percent (about 1.95 million acres) is occupied by irrigated agriculture. Crop type varies by location within the region; main crops on the valley floor include rice, walnuts, almonds/pistachios, pasture, alfalfa and grain. Of the region's 1.95 million acres of irrigated agriculture, roughly 1.58 million acres are located on the valley floor and approximately 370,000 irrigated acres are located in the surrounding mountain valleys, which is primarily pasture and alfalfa. In 2010, the population of the region was 2.93 million. Cities and towns north of Sacramento are located in predominantly agricultural areas. (California Department of Water Resources, 2013a)

Hydrology

The principal surface water feature of the region is the Sacramento River. Major tributaries include the Feather River and American River. Flows in the Sacramento River are influenced by precipitation (rainfall and snowpack/snowmelt), but are also influenced by several reservoirs on the tributaries and main stem, which are managed for flood control, water supply, and hydroelectric power generation by federal, state, and local water projects. Irrigation diversions and agricultural return flows also affect the river regime.

The Sacramento Valley Groundwater Basin is the main groundwater basin located in the Sacramento River Hydrologic Region. The basin is divided into 18 groundwater sub-basins, based on hydrologic, geologic, and political boundaries, covering 6,057 square miles of the Central Valley floor. Other groundwater basins within the Sacramento River Hydrologic Region are identified in Figure 2-3. Groundwater generally flows from the foothills on either side, toward the Sacramento River, and south toward the Delta.

SAN JOAQUIN RIVER HYDROLOGIC REGION

The San Joaquin River Hydrologic Region covers 15,880 square miles and includes the entire area drained by the San Joaquin River. It includes all watersheds tributary to the San Joaquin River and the Delta south of the Sacramento River and south of the American River watershed. For basin planning purposes, this region excludes the Tulare Lake Basin. (Central Valley Water Board, 2016)

Climate

Precipitation in the San Joaquin River Hydrologic Region generally decreases from north to south with annual average ranging from 14 inches in Stockton to 10 inches in Madera on the valley floor (California Department of Water Resources, 2013c) (Western Regional Climate Center, 2018). Although the Coast Ranges tend to prevent marine temperature effects, the northern portion of the valley receives a Delta breeze, decreasing temperatures during summer evenings. The southern portion of the region does not tend to experience this cooling effect. The warmer and drier conditions in the San Joaquin River watershed result in considerably less runoff compared to the Sacramento River watershed. (California Department of Water Resources, 2013c).

Land Cover and Land Uses

The San Joaquin River Hydrologic Region contains roughly 3.5 million acres of valley floor, 5.8 million acres of mountains and eastern foothills, and 900,000 acres of coastal mountains. The San Joaquin Valley is one of the world's most productive agricultural regions and agriculture remains the dominant economic sector in the region. Most of the valley floor is privately owned agricultural land, while much of the Sierra Nevada is national forest and government-owned public lands. Approximately 22 percent of the region (about 2.17 million acres) is occupied by irrigated agriculture. Main crops grown in the region include almonds, corn, alfalfa, grapes and processing tomatoes. The agricultural output is valued annually at more than $9.3 billion. (California Department of Water Resources, 2013c).

Urban developments have increased in size over the last two decades, expanding onto the surrounding agricultural lands. Approximately 5 percent of the state's population lives in the region and in 2010, the population was 2.10 million. A number of disadvantaged communities reside in the region and four of the most populous cities in the region qualify as disadvantaged. In addition, eleven federally recognized tribes live in the region. (California Department of Water Resources, 2013c).

Hydrology

The San Joaquin River is the principal surface water body in the hydrologic region. The major tributaries that drain from the Sierra Nevada to the San Joaquin River within the hydrologic region are the Calaveras, Mokelumne, Cosumnes, Merced, Tuolumne, and Stanislaus rivers. As with the Sacramento River, flows in the San Joaquin River are influenced by precipitation (rainfall and snowpack/snowmelt), as well as reservoirs on the main stem and tributaries, which are managed for flood control, water supply, and/or hydroelectric power generation by the federal CVP, regional, and local water projects.

The San Joaquin Groundwater Basin is the main groundwater basin in the region. This basin covers both the San Joaquin River and the Tulare Lake Hydrologic Regions, and is divided into 16 groundwater sub-basins, based on hydrologic, geologic, and political boundaries, covering 10,591 square miles of the Central Valley floor. Groundwater movement in the San Joaquin Valley is driven by local pumping stresses, but generally flows from the eastern foothills of the Sierra Nevada to the west, toward pumping depressions. Regionally, groundwater flows to the north toward the Delta.

TULARE LAKE HYDROLOGIC REGION

The Tulare Lake Hydrologic Region comprises the drainage area of the San Joaquin Valley south of the San Joaquin River. Valley floor lands make up slightly less than one-half of the total basin land area (Central Valley Water Board, 2015).

Climate

The Tulare Lake Hydrologic Region experiences scarce amounts of precipitation, ranging from an annual average of 11 inches in Fresno to 6 inches in Bakersfield (Western Regional Climate Center 2016). Temperatures on the valley floor are usually mild during the winter months; however, heavy frost occurs during most years and during cold spells the air temperature occasionally drops below freezing (California Department of Water Resources, 2013d).

Land Cover and Land Uses

Of the Tulare Lake Hydrologic Region's 17,000 square miles, 27 percent (about 2.9 million acres) is occupied by irrigated agriculture. Main crops grown in the region include almonds/pistachios, vineyards, corn, grain and cotton. In 2010, the population of the region was 2.27 million. Main cities include Fresno, Bakersfield and Visalia. Although agriculture remains the dominant form of land use in the basin, urban land use is increasing (California Department of Water Resources, 2013d)

Hydrology

The Tulare Lake Hydrologic Region has few natural surface water sources; most of these originate from Sierra Nevada snowmelt and are concentrated in the eastern portion of the basin. The basin is essentially a closed system, draining only into the San Joaquin River in extreme wet years (Central Valley Water Board, 2015). This hydrologic region is part of the San Joaquin Groundwater Basin, comprised of the Tulare Lake, Kings, Westside, Tule, Kern County, and Kaweah sub-basins, covering 4,783 square miles. Primary sources of water into the basin are imports through state and federal water projects.

SACRAMENTO-SAN JOAQUIN DELTA

Surface water from the Sacramento River Hydrologic Region and the San Joaquin River Hydrologic Region meet at the Delta, which ultimately drains to San Francisco Bay. The Delta is a maze of river channels and diked islands covering roughly 1,150 square miles, including 78 square miles of water area (Central Valley Water Board, 2016).

Two major water projects, the Central Valley Project (CVP) and the State Water Project (SWP), deliver water from the Delta to Southern California, the San Joaquin Valley, Tulare Lake Basin, the San Francisco Bay area, as well as within the Delta boundaries. Table 2-1 presents primary inflow and outflow quantities for the Delta. The primary source of inflow to the Delta is the Sacramento River. The largest Delta outflow is to the San Francisco Bay, followed by SWP and CVP exports to south of Delta water users.

Table 2 - 1. Sacramento-San Joaquin Delta Inflows and Outflows.

Delta Inflows and Outflows	Annual Total (Thousand Acre-Feet) [a]	Percent of Inflow
Inflows		
Sacramento River	12,777	80%
East Side Tributaries	633	4%
San Joaquin River	659	4%
Yolo Bypass	1,829	12%
Outflows		
North Bay Aqueduct	43	0%
Contra Costa Canal	94	1%
State Water Project	2,496	16%
Central Valley Water Project	2,141	13%
Outflow to San Francisco Bay	10,247	64%

Notes:[a]Volumes reported are for water year 2010 (a dry water year in the Sacramento Valley and a below normal year in the San Joaquin Valley).
Source: California Department of Water Resources 2013b, Figure D-1.

The Delta is a primary source water for agricultural and municipal drinking water supplies. As such, salinity levels and concentrations of constituents with drinking water standards are of concern to these users.

2.1.2 Water Quality Conditions

Information from several studies conducted under the CV-SALTS initiative were utilized to evaluate salt and nitrate conditions in the Central Valley (Table 2-2). Summary tables and figures of the resulting data are included in Appendix A and Appendix B for surface waters and groundwater, respectively. Additional data was also compiled from the California Environmental Data Exchange Network (CEDEN) and United States Geological Survey (USGS) Water Quality Portal. The data compilation focused on electrical conductivity (EC) and nitrate as well as aluminum, manganese, turbidity, and other constituents with secondary drinking water maximum contaminant levels (SMCLs). The additional information on SMCLs provides background for proposed new polices, strategies, and guidance that may affect the regulation of these parameters. In addition, several watershed sanitary surveys were reviewed to supplement the information developed from the data compilation (Larry Walker Associates, 2016b).

Table 2 - 2. CV-SALTS Technical Studies Completed to Satisfy Specific Recycled Water Policy SNMP Requirements for the Evaluation of Salt and Nitrate

Required Recycled Water Policy Component	Relevant CV-SALTS Studies[1]
Salt and nutrient (nitrate) source identification	• Larry Walker Associates et al. 2013. Initial Conceptual Model Final Report: Task 7 and 8 - *Salt and Nitrate Analysis for the Central Valley Floor and a Focused Analysis of Modesto and Kings Subregions*. December 2013. • Larry Walker Associates et al. 2016. *Management Zone Archetype Analysis Report: Alta Irrigation District*. July 2016. • CDM Smith. 2016a. *Nitrate Implementation Measures Study*. March 2016. • CDM Smith 2013 and 2014. SSALTS *Final Phase 1 Report: Identification and Characterization of Existing Salt Accumulation Areas*; and *Final Phase 2 Report: Development of Potential Salt Management Strategies*. December 2013 and October 2014, respectively.
Basin/subbasin assimilative capacity	• Larry Walker Associates et al. 2013. Initial Conceptual Model Final Report: Task 7 and 8 - *Salt and Nitrate Analysis for the Central Valley Floor and a Focused Analysis of Modesto and Kings Subregions.* December 2013. • Luhdorff & Scalmanini Consulting Engineers and Larry Walker Associates. 2016a. *Region 5: Updated Groundwater Quality Analysis and High Resolution Mapping for Central Valley Salt and Nitrate Management Plan*; July 2016.
Basin/subbasin loading estimates	• Larry Walker Associates et al. 2013. Initial Conceptual Model Final Report: Task 7 and 8 - *Salt and Nitrate Analysis for the Central Valley Floor and a Focused Analysis of Modesto and Kings Subregions.* December 2013.
Fate and transport of salts and nutrients (nitrate)	• Larry Walker Associates et al. 2013. Initial Conceptual Model Final Report: Task 7 and 8 - *Salt and Nitrate Analysis for the Central Valley Floor and a Focused Analysis of Modesto and Kings Subregions.* December 2013.
Source: [1] Referenced CV-SALTS studies may be accessed at: http://www.cvsalinity.org/index.php/committees/technical-advisory/technical-projects-index.html	

2.1.2.1 Surface Water Quality

Summary information on the overall salt, as electrical conductivity (EC), and nitrate (as nitrogen) conditions in the Central Valley is presented in Table 2-3. For context, salt concentrations measured EC are evaluated against the “recommended” secondary maximum contaminant level (MCL) of 900 µS/cm EC, which was developed to reflect consumer preferences for drinking water. Nitrate concentrations are evaluated against the primary MCL of 10 mg/L-N. Additional information by basin is provided below.

Table 2 - 3. Summary of EC and Nitrate (as N) Water Quality Conditions in Surface Waters in the Central Valley Region

Hydrologic Region	EC Conditions	Nitrate (as N) Conditions
Sacramento River	• Water quality is good in this region, with median and 1st through 3rd quartile values at all monitoring locations below 900 µS/cm.	• Nitrate water quality is very good, with median and 1st through 3rd quartile observations at all monitoring locations well below the primary MCL of 10 mg/L as N, with some sites typically below 0.5 mg/L.
San Joaquin River	• Eastside Tributaries - Lower than the recommended SMCL of 900 µS/cm. • Westside Tributaries – EC values between the 1st and 3rd quartiles are at or above the recommended SMCL objective. • Mainstem – Wide range of values; concentrations are dependent on water year type and the water quality and flows of the east side tributaries.	• Eastside Tributaries – Lower than the primary MCL of 10 mg/L as N, with values often less than 1.0 mg/L. • Westside Tributaries – Nitrate values are higher than eastside tributaries, but median values are still below the primary MCL. • Mainstem – Median nitrate values generally are around 1 to 2 mg/L nitrate as N; one site with a median level near 10 mg/L has a limited dataset.
Tulare Lake	• Median and calculated values within the 1st and 3rd quartiles are lower than the recommended SMCL with the exception of the Main Drain Canal, where high EC levels above 900 µS/cm have been observed during irrigation events	• All observations in this region are well below the primary MCL of 10 mg/L as N with median values in the 0.1 to 0.2 mg/L range.
Delta Region	• EC levels rarely exceed the recommended SMCL of 900 µS/cm	• All observations are well below the primary MCL with median values around 0.5 mg/L.

Salt and Nitrate Concentrations

Sacramento River Basin

Surface waters in the Sacramento River Hydrologic Region generally support their beneficial uses, including drinking and irrigation water, recreation, and protection of fish and other aquatic life. Primary water quality concerns include potential aquatic life toxicity and domestic water supply use impacts associated with pesticides, mercury and methylmercury accumulation in the food chain, erosion and sediment transport/deposition, and temperature impacts to coldwater species (Sacramento River Watershed Program, 2018).

When compared to other areas within the Central Valley, surface waters in the region generally have low salt and nitrate levels. The northern reaches of the Sacramento River have very low salt concentrations. As the water travels south through the valley, contact with natural salts in the soil, as well as agricultural and industrial anthropogenic activities can elevate salt and nitrate concentrations. Surface waters within the Sacramento Valley consistently have total nitrate concentrations less than 10 mg/L as nitrogen (mg/L-N) and EC levels less than 1,000

µmhos/cm. The EC levels at the evaluated stations are typically in the low 100 µmhos/cm, with the exception of the Colusa Basin Drain, which has levels upwards to 1,000 µmhos/cm.

San Joaquin River Basin

The surface water quality of the San Joaquin River Hydrologic Region is primarily dependent upon the source of the water, geologic influence, land use, and reservoir operations. Streams in the western portion of the region are mainly ephemeral, with the downstream channels mainly being used to transport high salinity agricultural return flows to the main channel of the San Joaquin River. The eastern portion of the region is generally characterized by higher quality surface water derived from Sierra Nevada snowmelt. Maintaining surface water quality for beneficial use protection is a significant issue for the river, with elevated concentrations of salts being of primary concern.

The compiled water quality data indicates that within the San Joaquin River Hydrologic Region, the eastside tributaries (Cosumnes, Merced, Stanislaus, and Tuolumne rivers) show EC levels lower than the recommended secondary MCL of 900 µmhos/cm, whereas tributaries to the west and southwest of the San Joaquin River (Mud Slough, Salt Slough, and Orestimba Creek) have EC levels that typically fall at or above 900 µmhos/cm. EC levels within the main stem San Joaquin River are highly variable and tend to decrease from Crows Landing downstream toward Vernalis, likely due to higher quality inflows from the east side tributaries.

Nitrate concentrations in the tributaries to the east of the San Joaquin River (Cosumnes, Merced, Stanislaus, and Tuolumne rivers) are lower than the primary MCL of 10 mg/L-N. Nitrate concentrations are higher in tributaries to the west and southwest of the San Joaquin River, with historical concentrations greater than 10 mg/L-N (Mud Slough, and Salt Slough), but with a median still below the primary MCL.

Tulare Lake Basin

Where measured, nitrate concentrations in natural source waters are generally below 10 mg/L-N. EC levels in natural source waters are variable, but are typically below 1,000 µmhos/cm.

However, irrigation drainage and canals can experience EC levels above 1,000 µmhos/cm (Buena Vista Coalition, 2014; Larry Walker Associates, 2016b). Water bodies on the valley floor of the Tulare Lake Basin are primarily comprised of irrigation and drainage canals.

Sacramento-San Joaquin Delta

The primary water quality concerns facing municipal water suppliers that rely on the Delta as a source water are high concentrations of organic carbon and bromide in the source water (which can contribute to the formation of disinfection byproducts), pathogens, high nutrient concentrations (and associated taste and odor problems from algal blooms), and high TDS concentrations due to associated challenges with blending, groundwater recharge, and wastewater recycling (Archibald Consulting et al., 2012). The primary sources of salinity in the Delta are from tidal seawater intrusion from the Pacific Ocean through the San Francisco Bay and, to a lesser extent, from agricultural and other discharges in the Central Valley. The timing and distribution of salinity is primarily affected by flow, which is largely determined by water management in the Delta and its watersheds (California Department of Water Resources, 2013b).

Concentrations of Secondary Maximum Contaminant Levels (SMCLs)

Information on total and dissolved surface water concentrations of constituents identified with secondary maximum contaminant levels is summarized in tables as part of Appendix A.

Compiled data indicates that within the Sacramento River Basin aluminum (dissolved), iron (dissolved), and manganese (dissolved) levels are typically below secondary MCLs. Sample concentrations of total aluminum, iron, and manganese concentrations were found to be greater than secondary MCLs. Notably, three water treatment plants (WTP) on the Sacramento River – George Kristoff WTP, Sacramento River WTP, and Vineyard Surface WTP – are able to treat iron and aluminum to non-detectable levels or very low detectable levels in treated water with levels below than secondary MCLs (Starr Consulting et al., 2015). These WTPs also are able to treat the source river water to meet the manganese secondary MCL (Starr Consulting et. al 2015).

Turbidity levels are seasonably variable, with the highest levels occurring in the wet season, typically in January and February.

In the San Joaquin River Basin, aluminum (dissolved), iron (dissolved), and manganese (dissolved) levels are typically below secondary MCLs. The exceptions are Mud Slough and Salt Slough, where median and average dissolved manganese concentrations are above the secondary MCL.

Turbidity levels in the San Joaquin River are high when flows first increase following storm events, then decrease during prolonged periods of high flows. In the summer months, San Joaquin River turbidity increases as flow decreases, possibly due to the greater influence of agricultural return flows.

CWA 303(d) Listed Impairments

Certain water bodies in the region have been listed on the state's CWA section 303(d) list of impaired water bodies due to exceedance of water quality objectives for constituents addressed by the proposed amendments (i.e., salinity parameters, nitrate, constituents with secondary MCLs). Of these constituents, only impairments associated with salinity parameters (i.e., EC, total dissolved solids [TDS]) are listed for the Sacramento River Hydrologic Region (Table 2-4). There are no CWA section 303(d) listings of metals or nitrate associated with protection of municipal water supplies in the Sacramento River Hydrologic Region

Certain water bodies within the San Joaquin River Basin have been listed on the state's CWA section 303(d) list of impaired water bodies due to exceedance of water quality objectives for salinity parameters and select secondary MCLs (Table 2-5). Salinity water quality objectives based on EC, as well as an implementation program for the reach of the Lower San Joaquin River upstream of Vernalis, were adopted by the Central Valley Water Board (Resolution R5-2017- 0062) and approved by the State Water Board (Resolution No. 2018-0002) as one of the case studies for the proposed Salt and Nitrate Control Program. The new objectives and implementation program will become effective in 2019 and are anticipated to resolve the salinity impairments within the river from the mouth of the Merced River to the Delta noted in Table 2-5.

There are no CWA section 303(d) listings of nitrate associated with protection of municipal water supplies in the San Joaquin River Hydrologic Region.

Table 2 - 4. Clean Water Act Section 303(d) Listings for Salinity-related Parameters and Constituents with Secondary MCLs in the Sacramento River Hydrologic Region

Pollutant	Water Body	Rationale for Listing
Electrical Conductivity (EC) / Specific Conductance (SC) / Total Dissolved Solids (TDS)	**Knights Landing Ridge Cut (Yolo County)**	Levels exceeded TDS secondary MCL of 500 mg/L and SC secondary MCL of 900 umhos/cm.
	Spring Creek (Colusa County)	Levels exceeded TDS secondary MCL of 500 mg/L and SC secondary MCL of 900 umhos/cm.
	Tule Canal (Yolo County)	Levels exceeded TDS secondary MCL of 500 mg/L and SC secondary MCL of 900 umhos/cm.
	Pit River, South Fork	Levels exceeded and SC secondary MCL of 900 umhos/cm.
Source: (State Water Board, 2015)		

Table 2 - 5. Clean Water Act Section 303(d) Listings for Salinity-related Parameters and Constituents with Secondary MCLs in the San Joaquin River Hydrologic Region

Pollutant	Water Body	Rationale for Listing
Aluminum	Carson Creek (WWTP to Deer Creek)	Concentrations exceeded secondary MCL of 200 µg/L.
Chloride	Mountain House Creek (from Altamont Pass to Old River, Alameda and San Joaquin Counties; partly in Delta Waterways, southern portion)	Concentrations exceeded chloride secondary MCL of 250 mg/L.
Iron	Deer Creek (Sacramento County)	Concentrations exceeded secondary MCL of 300 µg/L.
Manganese	Carson Creek (WWTP to Deer Creek)	Concentrations exceeded secondary MCL of 50 µg/L.
Electrical Conductivity (EC) / Specific Conductivity (SC) / Total Dissolved Solids (TDS)	Del Puerto Creek	Levels exceeded TDS secondary MCL of 500 mg/L and SC secondary MCL of 900 umhos/cm.
	Grasslands Marshes	Exceedance of agricultural supply EC objectives (objectives not specified – pre-2006 listing)
	Ingram Creek (from confluence with San Joaquin River to confluence with Hospital Creek)	Levels exceeded TDS secondary MCL of 500 mg/L and SC secondary MCL of 900 umhos/cm.
	Hospital Creek	Levels exceeded TDS secondary MCL of 500 mg/L and SC secondary MCL of 900 umhos/cm.

Table 2 - 5. Clean Water Act Section 303(d) Listings for Salinity-related Parameters and Constituents with Secondary MCLs in the San Joaquin River Hydrologic Region

Pollutant	Water Body	Rationale for Listing
	Mud Slough (upstream and downstream of San Luis Drain)	Exceedance of agricultural supply EC objectives (objectives not specified – pre-2006 listing)
	Newman Wasteway	Levels exceeded TDS secondary MCL of 500 mg/L and SC secondary MCL of 900 umhos/cm.
	Ramona Lake (Fresno County)	Levels exceeded TDS secondary MCL of 500 mg/L and SC secondary MCL of 900 umhos/cm.
	Salado Creek	Levels exceeded TDS secondary MCL of 500 mg/L and SC secondary MCL of 900 umhos/cm.
Electrical Conductivity (EC) / Specific Conductivity (SC) / Total Dissolved Solids (TDS)	Salt Slough	Exceedance of agricultural supply EC objectives (objectives not specified – pre 2006 listing)
	San Joaquin River (Bear Creek to Mud Slough; Mud Slough to Merced River; Merced River to Tuolumne River; Tuolumne River to Stanislaus River; Stanislaus River to Delta Boundary)	Levels exceeded SC secondary MCL of 900 umhos/cm and southern Delta EC objectives for agricultural beneficial uses (0.7/1.0 mmhos/cm). [a]
	Temple Creek	Exceedance of agricultural supply EC objectives (objectives not specified – pre 2006 listing).
Zinc	Camanche Reservoir	Exceedance of 500 mg/L primary drinking water MCL.

Notes: [a] Listing is for exceedance of Bay-Delta Water Quality Control Plan EC objectives for the Southern Delta, which are 30-day running average mean daily EC of 0.7 mmhos/cm for April 1 through August 30 and 1.0 mmhos/cm for September 1 through March 31.

Source: (State Water Board, 2015)

Few surface water bodies within the Tulare Lake Basin are identified as impaired under CWA 303(d) due to the fact that the majority of water bodies with elevated salinity, nitrate or SMCL concentrations are located on the valley floor of the basin and are not designated with the MUN beneficial uses so are not subject to meeting water quality objectives to protect that use. A segment of the Kings River is identified in Table 2-6.

Table 2 - 6. Clean Water Act Section 303(d) Listings for Salinity-related Parameters and Constituents with Secondary MCLs in the Tulare Lake Hydrologic Region

Pollutant	Water Body	Rationale for Listing
Electrical Conductivity (EC)	Kings River, Lower (Island Weir to Stinson and Empire Weirs)	Levels exceeded Tulare Basin Plan EC objective of 300 µmhos/cm.
Source: (State Water Board, 2015)		

Certain water bodies in the Delta have been listed on the state's CWA section 303(d) list of impaired water bodies due to exceedance of water quality objectives associated with salinity parameters (i.e., EC, TDS), and are listed in Table 2-7.

Table 2 - 7. Clean Water Act Section 303(d) Listings for Salinity-related Parameters and Metals with Secondary MCLs in the Delta Region Associated with Municipal and Domestic Supply (MUN) and Agricultural (AGR) Beneficial Use Impairments

Pollutant	Water Body	Rationale for Listing
Chloride	Tom Paine Slough (in Delta Waterways, southern portion)	Concentrations exceeded chloride secondary MCL of 250 mg/L.
Electrical Conductivity (EC) / Specific Conductivity (SC) / Total Dissolved Solids (TDS)	Delta waterways (export area, northwestern portion, southern portion, western portion)	Exceedance of agricultural supply EC objectives
	Kellogg Creek (Los Vaqueros Reservoir to Discovery Bay; partly in Delta Waterways, western portion)	Levels exceeded TDS secondary MCL of 500 mg/L and SC secondary MCL of 900 umhos/cm.
	Mountain House Creek (from Altamont Pass to Old River, Alameda and San Joaquin Counties; partly in Delta Waterways, southern portion)	Levels exceeded TDS secondary MCL of 500 mg/L and SC secondary MCL of 900 umhos/cm.
	Old River (San Joaquin River to Delta-Mendota Canal; in Delta Waterways, southern portion)	Levels exceeded SC secondary MCL of 900 umhos/cm and southern Delta EC objectives for agricultural beneficial uses (0.7/1.0 mmhos/cm). [a]
	Sand Creek (tributary to Marsh Creek, Contra Costa County; partly in Delta Waterways, western portion)	Levels exceeded TDS secondary MCL of 500 mg/L and SC secondary MCL of 900 umhos/cm.

Notes: [a] Listing is for exceedance of Bay-Delta Water Quality Control Plan EC objectives for the Southern Delta, which are 30-day running average mean daily EC of 0.7 mmhos/cm for April 1 through August 30 and 1.0 mmhos/cm for September 1 through March 31.

2.1.2.2 *Groundwater Quality*

Groundwater

Groundwater quality analyses and mapping using high-resolution techniques were prepared for CV-SALTS SNMP (2016) and are described in the Updated Groundwater Quality Analysis and High Resolution Mapping (Luhdorff & Scalmanini and Larry Walker Associates, 2016a). The high resolution work provides a detailed look at groundwater quality conditions for nitrate and TDS throughout the Central Valley floor and groundwater basins/sub-basins within the Central Valley Region, including those located outside of the Central Valley floor. Summary tables and figures of the groundwater quality information, including aggregate (volume-weighted) nitrate and TDS concentrations by sub-basin are contained in Appendix B. General groundwater quality information is provided below.

Groundwater quality in the Sacramento River Hydrologic Region is considered, generally, to be excellent. There are natural water quality impairments at the north end of the Sacramento Valley and along the margins of the valley and around the Sutter Buttes, where marine sedimentary rocks containing brackish to saline water are near the surface, as well as other localized areas with natural saline upwelling that are contributing to high TDS in these areas. Human-induced impairments are generally associated with individual septic system development or other activities in shallow unconfined portions of aquifers or in fractured hard rock areas where insufficient soil depths are available to properly leach effluent before it reaches the local groundwater supply. Manganese and iron have been found in wells at concentrations greater than secondary MCLs (California Department of Water Resources, 2003). Elevated nitrate has also been found in localized areas.

In general, groundwater constituents of concern in the San Joaquin River hydrologic area include TDS, nitrate, boron, and chloride. Areas of high TDS content are primarily along the west side of the San Joaquin Valley and in the trough of the valley. The high TDS on the west side is primarily due to recharge of streamflow originating from marine sediments in the Coast Ranges. The high TDS in the valley trough is primarily associated with the concentration of salts due to evaporation and poor drainage. Nitrate may occur naturally or as a result of disposal of human and animal waste products and as a result of fertilizer application. Boron and chloride are likely a result of concentration from evaporation near the valley trough. Aluminum, manganese and iron have been found in wells at concentrations greater than secondary MCLs (California Department of Water Resources, 2003).

East side waters in the Tulare Lake Basin originate from the Sierra Nevada and reflect their source in the crystalline granitic rocks. Due to mineralogy, TDS concentrations are low, in the 100–300 mg/L range. West side waters originate from marine sediments, which are high in sulfate and sodium. TDS concentrations can be >1,000 mg/L. Because groundwater in the valley originates from the west side and east side, water quality is variable. The organic-rich fine grained sediments in this area can result in reducing conditions that cause metals such as iron and manganese to become soluble, sometimes in excess of drinking water MCLs. (Sholes 2006, California Department of Water Resources 2003) Aluminum has been detected in wells above drinking water MCLs as well as arsenic and hexavalent chromium in some of the deeper portions of the aquifer (California Department of Water Resources, 2003).

High Resolution Mapping Results

The CV-SALTS SNMP (2016) summarizes detailed information on salinity and nitrate concentrations in surface water and groundwater basins within the Central Valley. The

information includes source identification, ambient concentrations, available assimilative capacity, trends in water quality and fate and transport of salt and nitrate between sub-basins. Groundwater quality analyses and mapping using high resolution techniques were prepared as part of the Updated Groundwater Quality Analysis and High Resolution Mapping for Central Valley Salt and Nitrate Management Plan (Luhdorff & Scalmanini and Larry Walker Associates, 2016a). The high resolution work provides a detailed look at groundwater quality conditions throughout the Central Valley Floor and groundwater basins/sub-basins within Region 5, including those located outside of the Central Valley Floor.

The high resolution work includes the following analysis at the basin/sub-basin scale:

- Basic statistical analyses, including minimum, maximum, average, and median values for nitrate and TDS, for the 41 groundwater basins/sub-basins overlying the Central Valley Floor and for the other 85 basins/sub-basins in Region 5 that are located or partially located outside the Central Valley Floor.
- High resolution ambient groundwater quality maps (nitrate and TDS) for the Central Valley Floor (for three defined zones: Upper, Lower, and Production Zones) and for basins/sub-basins outside the Central Valley where sufficient data are available;
- High resolution assimilative capacity maps (nitrate and TDS) for the Central Valley Floor (Upper, Lower, and Production Zones) and for basins/sub-basins outside the Central Valley where sufficient data are available;
- Groundwater quality trends for the Central Valley Floor in the upper, lower, and production zones for both nitrate and TDS; and
- Maps featuring predicted future groundwater quality conditions for the 10, 20, and 50 year time frame.

As noted, the assessment focused on describing salt and nitrate conditions in the “upper,” “lower,” and “production” zones within each groundwater basin/sub-basin. The upper zone represents the majority of domestic well users who typically draw their supplies from shallower portions of the aquifer than agricultural, municipal or industrial users. The production zone represents the area of the aquifer screened for use from the surface of the groundwater to the lowest screened level. The only exception is if the area under consideration contains the confining Corcoran Clay layer. The top of the Corcoran Clay layer would be considered the bottom of the production zone. The Lower Zone is the area of the Production Zone below the Upper Zone. Figures 2-4 and 2-5 illustrate the vertical relationship of these zones relative to well types and the Central Valley’s Corcoran Clay layer, respectively.

Figure 2 - 4. Schematic of Aquifer System (Where Corcoran Clay Absent)

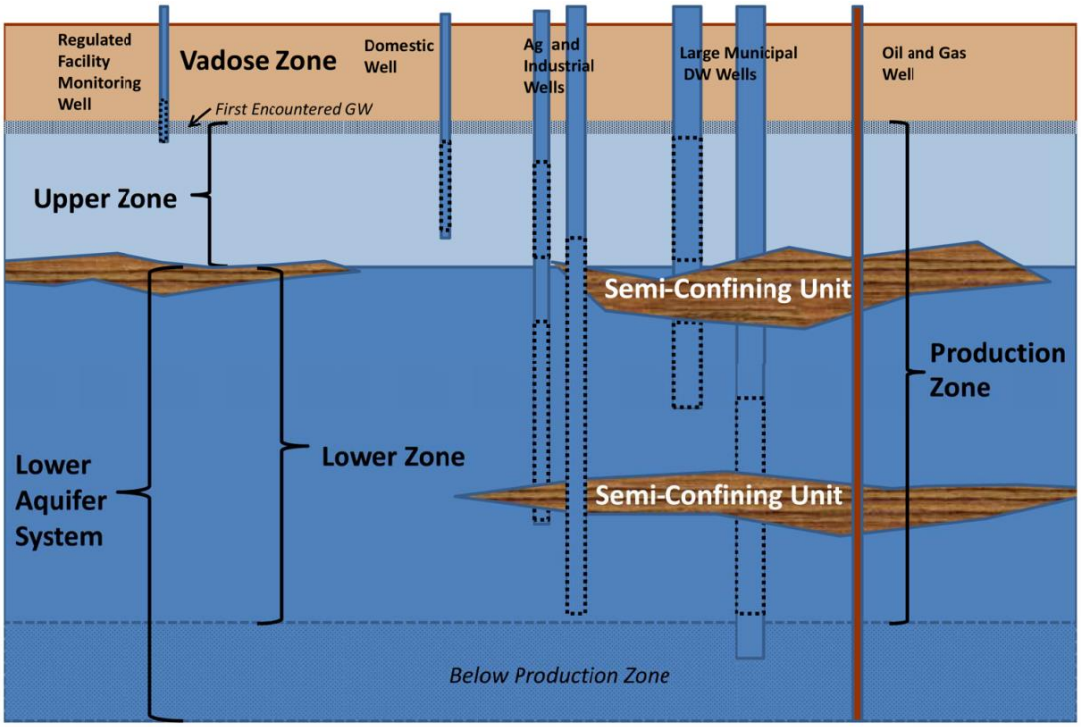
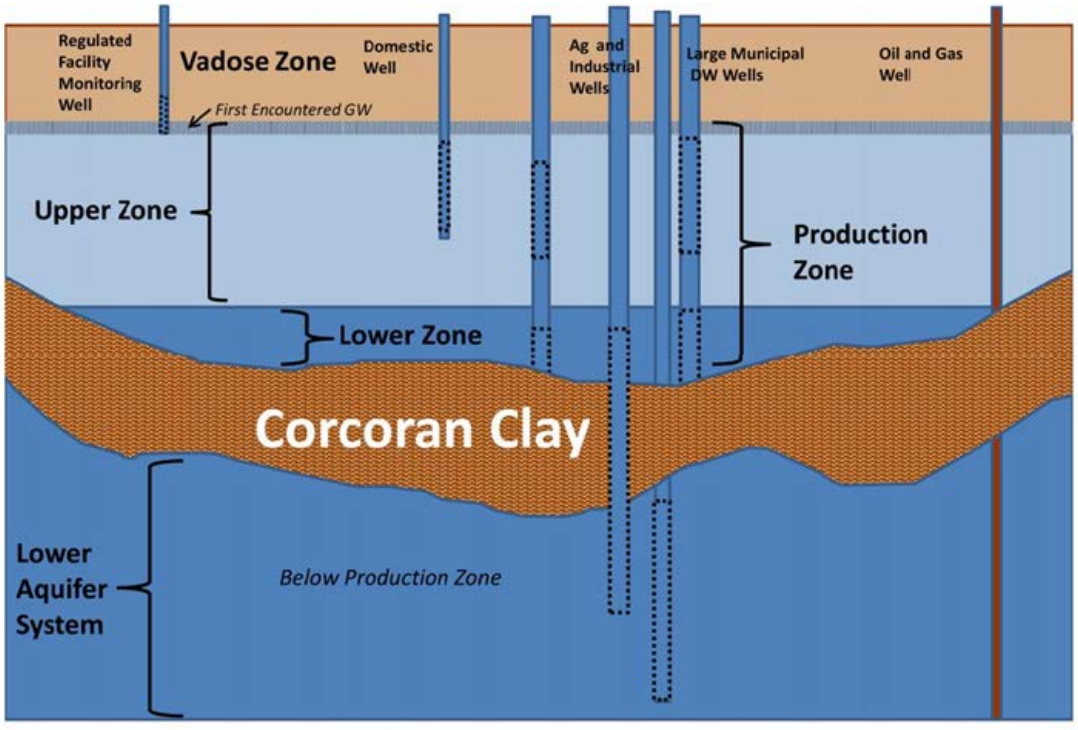


Figure 2 - 5. Schematic of Aquifer System (Where Corcoran Clay Layer Present)



The CV-SALTS database provided the water quality data used to support the various water quality analyses completed to describe salt and nitrate conditions in Central Valley Region. One square mile grid data were aggregated for each groundwater basin/sub-basin to describe volume-weighted salt and nitrate concentrations and estimate volume-weighted assimilative capacity.

Aggregate findings by groundwater basin/sub-basin are provided in Appendix B. Summary findings and resulting issues are discussed below.

Salt

Accumulation in the soil profile and groundwater are an ongoing concern. Many areas within the Central Valley have had historically elevated salinity concentrations due to the hydro-geologic nature of the basin, where water moved to low lying areas and continually evaporated over millions of years. Along the west side of the Central Valley, the water also moved through sedimentary marine layers with naturally elevated salt concentrations. When compounded by an extensive, impermeable clay lens (Corcoran Clay) that covers approximately half of the valley floor in the San Joaquin and Tulare Lake Basins (Figure 2-6), extensive areas either historically contained or are poised for elevated salinity concentrations.

Consumptive use through irrigation practices can also lead to accumulation of salt in the soil profile and, in turn, reduce productivity unless sufficient leaching is applied to move excess salt below the root zone. Due to the accumulation in the soil profile, 1.5 million acres of irrigated land has been identified as salinity-impaired, and a quarter million acres have been taken out of production (California Department of Water Resources communication, Jose Faria, Fresno Office). Accumulation in the groundwater is also widespread. Figure 2-7 depicts ranges of salinity concentrations in groundwater as measured in the production zone (area of the aquifer utilized by domestic, municipal, agricultural and industrial supply wells).

Concentrations of TDS below 450 mg/L are not anticipated to impact irrigated agriculture while concentrations above 2,000 mg/l are anticipated to have a severe impact (Ayers & Westcot, 1985). For municipal and domestic supply, TDS concentrations at or below 500 mg/L are recommended with an upper range of 1,000 mg/L and a short-term range up to 1,500 mg/L to protect human welfare (such as limiting corrosion of pipes) and provide for consumer acceptance. As noted in Figure 2-7, broad areas along the western side of the valley floor of the San Joaquin River and Tulare Lake Basins and more limited areas within the Sacramento River Basin have groundwater production zone concentrations exceeding 500 mg/L TDS.

Nitrate

Excessive nitrates are a significant issue for public health and safety. In some areas, high nitrate concentrations have rendered drinking water supplies unusable. Numerous communities in the Central Valley have nitrate levels in groundwater supplies that exceed the maximum contamination level of 10 mg/L nitrate as nitrogen (Central Valley Water Board, 2010). Figure 2-8 identifies ranges in nitrate concentration in the upper zone of groundwater aquifers on the floor of the Central Valley. The upper zone represents the majority of domestic well users who typically draw their supply from shallower portions of an aquifer than irrigation, industrial or municipal users. Unlike salinity, elevated levels of nitrate occur toward the eastside and central portions of the valley floor rather than along the west side. Similar to salinity, the areas of concern are broadly dispersed. Sources of nitrate include farming practices that have occurred for generations as well as wastewater treatment plants and food processing waste discharge,

onsite waste disposal systems (septic systems), urban land use, corrals and lagoons. The studies found that while current management actions are addressing sources of nitrates from farming practices and other activities, past activities have left legacy contamination in the groundwater as well as potential future contamination from the vadose zone (Harter, et al., 2012).

Figure 2 - 6. Extent of the Corcoran Clay in the Central Valley Floor

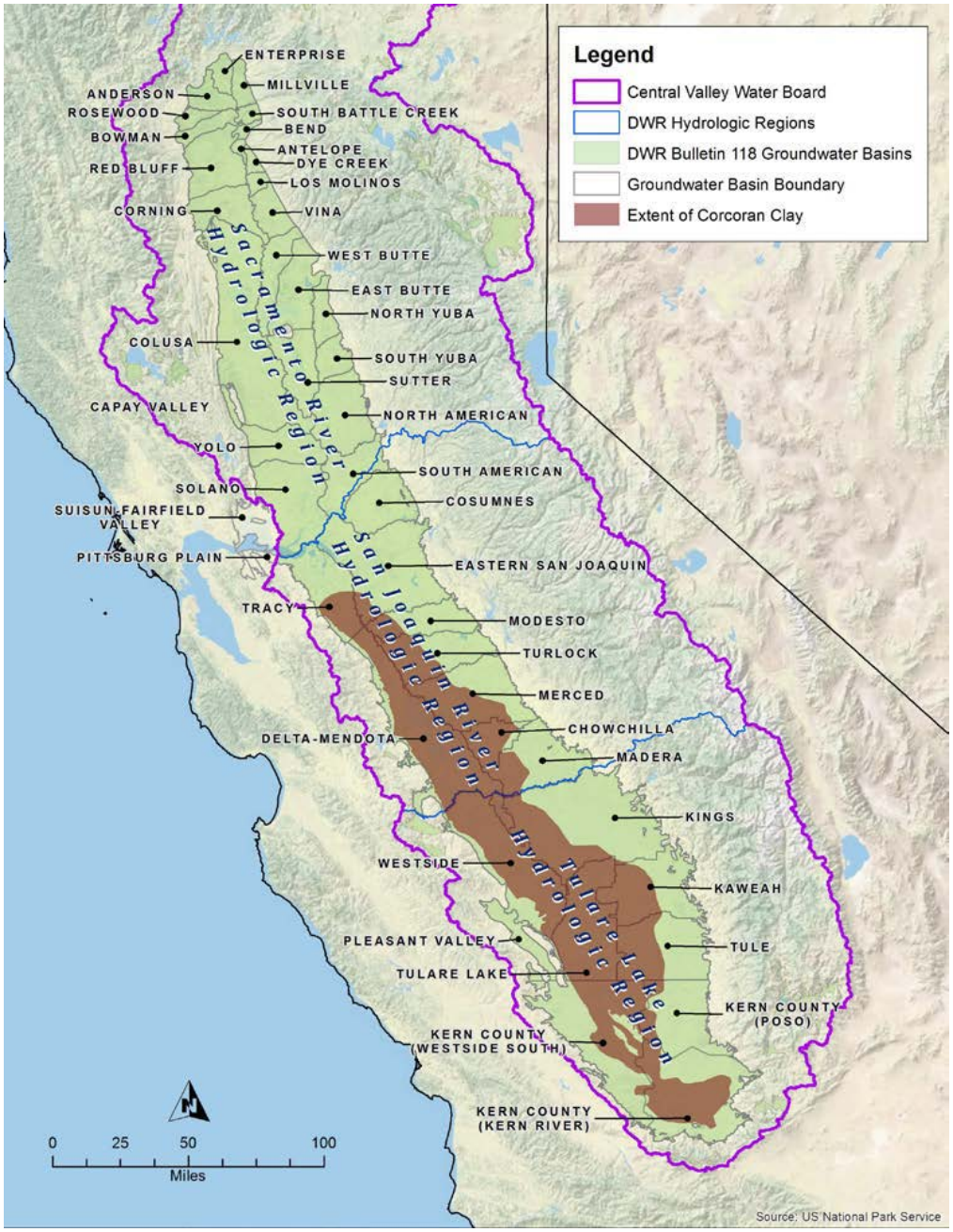


Figure 2 - 7. Ambient Groundwater Quality for Production Zone (TDS) mg/L

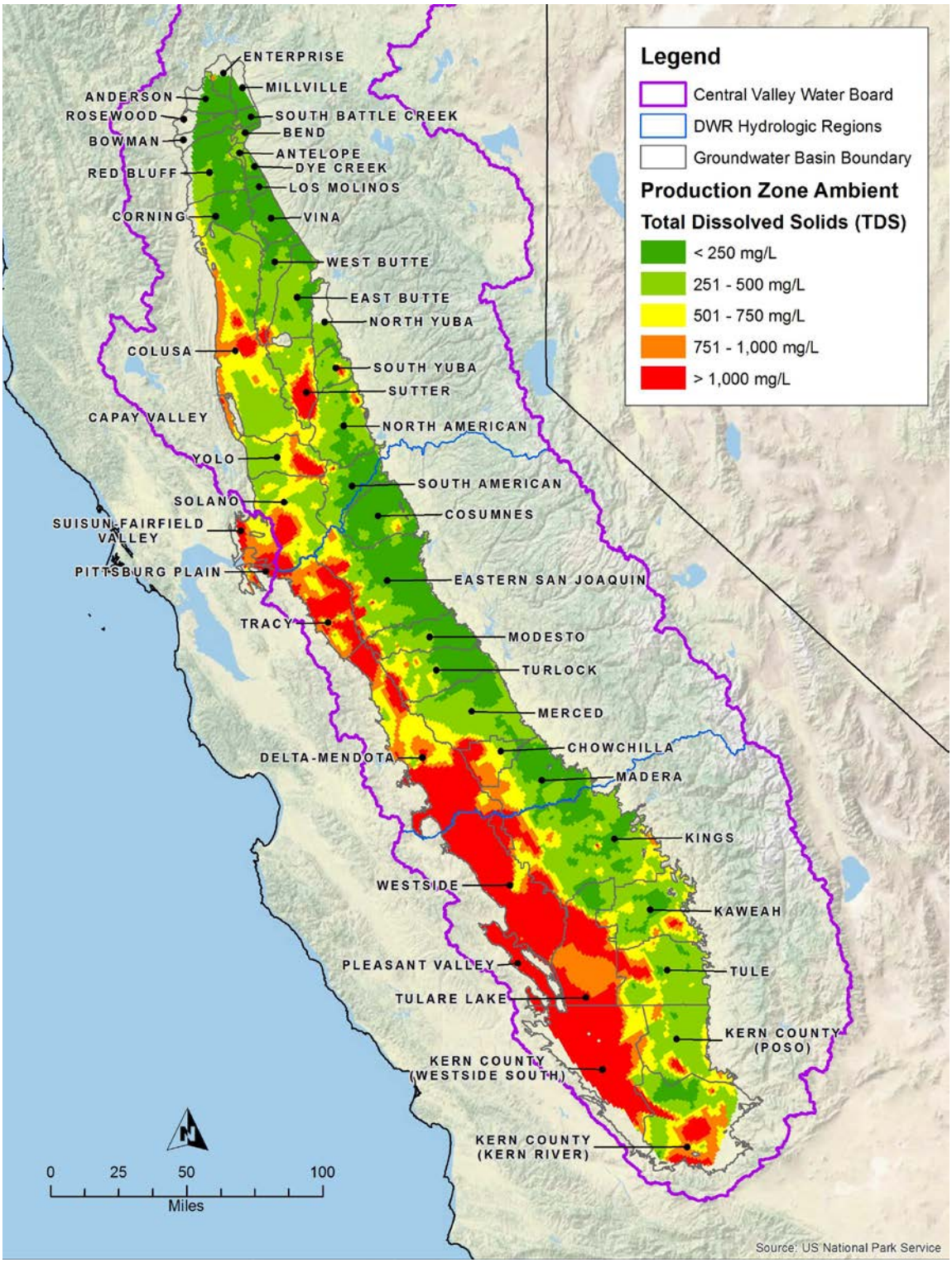
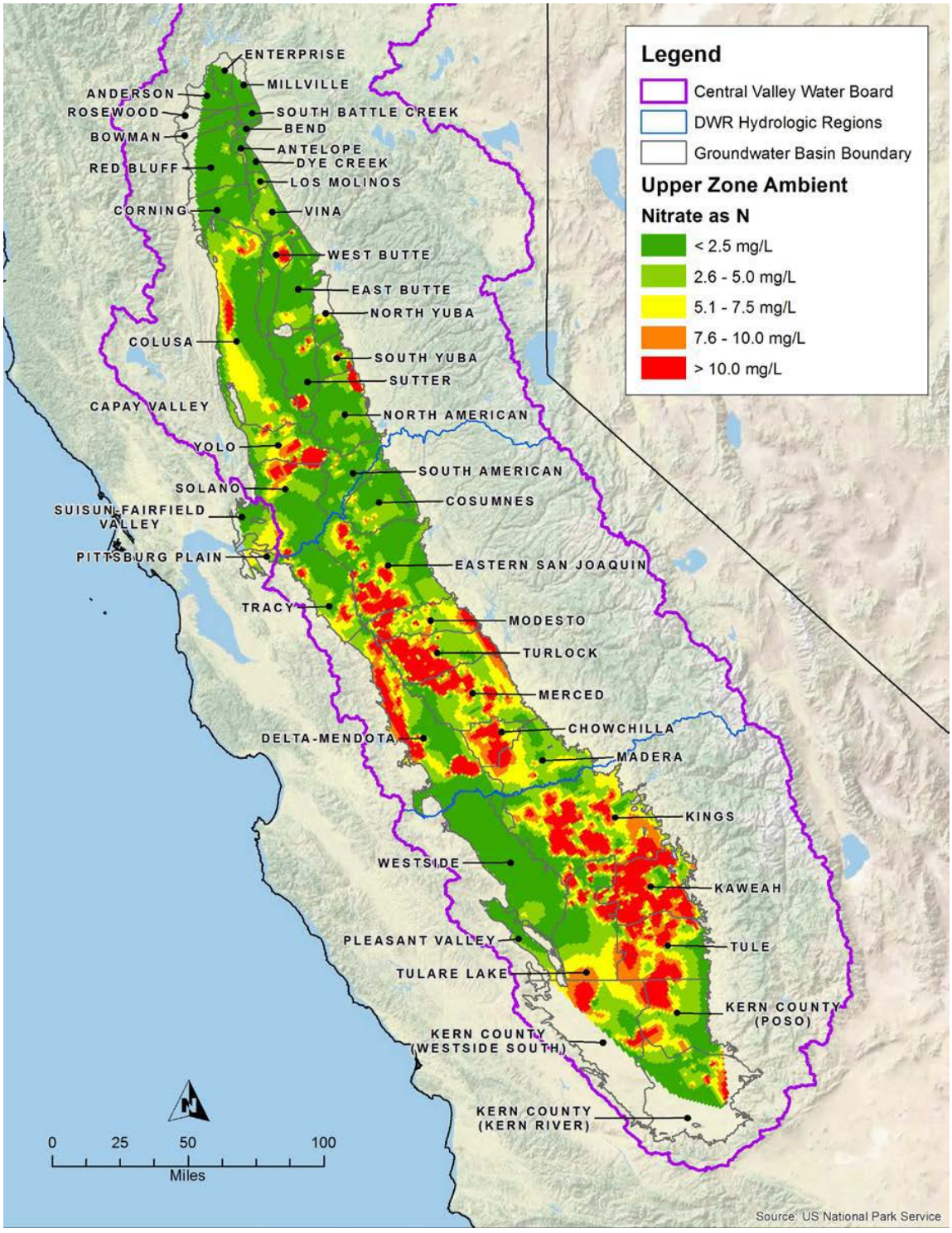


Figure 2 - 8. Ambient Conditions for Nitrate (mg/L as N) in the Upper Zone of Groundwater Basins/Subbasins in the Central Valley Floor



2.2 REGULATORY SETTING

Current Regulatory Authority and Process
This section describes key elements in the current Central Valley Water Quality Control Plans that govern the regulation of salt and nitrate discharges to surface waters and groundwater including designation of beneficial uses, water quality objectives to protect those uses and implementation strategies and/or policies related to salt and/or nitrate. Specific provisions for regulation of wastewater discharges to surface waters and groundwater from municipal, industrial, stormwater, agriculture and dairy sources are provided in Appendix C.

2.2.1 Central Valley Water Board Water Quality Control Plans (Basin Plans)

The Central Valley Water Board has adopted two water quality control plans: 1) *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins* (Sacramento-San Joaquin Basin Plan) and *Water Quality Control Plan for the Tulare Lake Basin* (Tulare Basin Plan; collectively Basin Plans). The Basin Plans define beneficial uses, water quality objectives, implementation programs, and surveillance and monitoring programs. Within the Sacramento River, San Joaquin River, and Tulare Lake Basins, unless otherwise designated by the Central Valley Water Board, all groundwaters in the Region are considered as suitable or potentially suitable, at a minimum, for municipal and domestic water supply (MUN), agricultural supply (AGR), industrial service supply (IND), and industrial process supply (PRO). Further, the Basin Plans specifically identify the designated beneficial uses for major surface water bodies in the Region in a table of beneficial uses (Table II-1 of the Basin Plans). Unless specifically identified in the Basin Plans, all surface waters in the Region are designated with the MUN beneficial use. The Basin Plans identify water quality objectives that are applicable based on the designated beneficial uses of surface water bodies and groundwater or by geographic area.

MUN Objectives and Related Regulatory Requirements

The Basin Plans define MUN as “uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.”.

Water quality objectives applicable when MUN is a designated beneficial use include the Chemical Constituents objective, which states, in part:

> “At a minimum, water[s] designated...MUN shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCLs) specified in the following provisions of Title 22 of the California Code of Regulations, which are incorporated by reference into this plan: Tables 64431-A (Inorganic Chemicals) and 64431-B (Fluoride) of Section 64431, Table 64444-A (Organic Chemicals) of Section 64444, and Tables 64449-A (Secondary Maximum Contaminant Levels-Consumer Acceptance Limits) and 64449-B (Secondary Maximum Contaminant Levels-Ranges) of Section 64449. This incorporation-by-reference is prospective, including future changes to the incorporated provisions as the changes take effect...The Regional Water Board acknowledges that specific treatment requirements are imposed by state and federal drinking water regulations on the consumption of surface waters under specific circumstances.” [The final sentence is included only in the Chemical Constituents objective for inland surface waters.]

The primary MCL specified for nitrate specified in Title 22 of the California Code of Regulations (Title 22) Table 64431-A is 10 mg/L-N; there is no secondary MCL.

The above-referenced secondary MCL tables, Tables 64449-A and 64449-B are provided in Table 2-8 and Table 2-9, respectively. These tables list the chemical constituents along with

their respective MCLs for Table 64449-A or "Recommended", "Upper", and "Short Term" levels for Table 64449-B.

Table 2 - 8. Secondary Maximum Contaminant Levels (Consumer Acceptance Contaminant Levels) in California Code of Regulations Table 64449-A

Constituent	Maximum Contaminant Level
Aluminum	0.2 mg/L
Color	15 Units
Copper	1.0 mg/L
Foaming Agents (MBAS)	0.5 mg/L
Iron	0.3 mg/L
Manganese	0.05 mg/L
Methyl-tert-butyl ether (MTBE)	0.005 mg/L
Odor Threshold	3 Units
Silver	0.1 mg/L
Thiobencarb	0.001 mg/L
Turbidity	5 Units
Zinc	5.0 mg/L

Table 2 - 9. Secondary Maximum Contaminant Levels (Consumer Acceptance Contaminant Levels) in California Code of Regulations Table 64449-B

Constituent (units)	Recommended	Upper	Short Term
Total Dissolved Solids (TDS) (mg/L) or Specific Conductance, µS/cm1	500	1,000	1,500
	900	1,600	2,200
Chloride (mg/L)	250	500	600
Sulfate (mg/L)	250	500	600
Notes: For purposes of implementation in WDRs, the MCL values for specific conductance are expressed as electrical conductivity.			

While the Title 22 section 64449 tables are referenced in the Basin Plans, the associated text contained in sections 64449 and 64449.2, with emphasis on 64449 (d) and (e), which provides context for the listed values, is not currently included or referenced in the Basin Plans. Consequently, neither of the Basin Plans provides guidance or policy on implementation when the Central Valley Water Board is developing permit requirements to implement secondary MCL-based objectives.

The Chemical Constituents also acknowledges that specific treatment requirements are imposed by state and federal drinking water regulations, the Basin Plans provide no implementation provisions for this text.

AGR Objectives and Related Regulatory Requirements

The Basin Plans define the AGR beneficial use as follows:

- Sacramento-San Joaquin Basin Plan: "Uses of water for farming, horticulture, or ranching including, but not limited to, irrigation (including leaching of salts), stock watering, or support of vegetation for range grazing." (Central Valley Water Board, 2016)
- Tulare Basin Plan: "Uses of water for farming, horticulture, or ranching, including, but not limited to, irrigation, stock watering, or support of vegetation for range grazing." (Central Valley Water Board, 2015)

The one difference between the two is the inclusion of the phrase "(including leaching of salts)" in the Sacramento-San Joaquin Basin Plan definition.

The Basin Plans establish criteria for making exceptions to the presumptive application of the AGR beneficial use to groundwater. Of relevance to the proposed amendments is the exception to the AGR beneficial use where, "There is pollution, either by natural processes or by human activity (unrelated to a specific pollution incident), that cannot reasonably be treated for agricultural use using either Best Management Practices or best economically achievable treatment practices."

Salinity-related water quality objectives specified in the Sacramento-San Joaquin Basin Plan for protection of the AGR beneficial use in groundwater consist only of the narrative Chemical Constituents objective, which states, "Groundwaters shall not contain chemical constituents in concentrations that adversely affect beneficial uses." The Tulare Basin Plan includes the same narrative Chemical Constituents objective but also establishes a policy that allows for controlling the rate of increase of salinity by regulating both the maximum increase in salinity concentrations attributable to consumptive use ("maximum EC shall not exceed the quality of the source water plus 500 µmhos/cm") and the maximum average annual increase in groundwater salinity on a basin-specific basis:

- "All groundwaters shall be maintained as close to natural concentrations of dissolved matter as is reasonable considering careful use and management of water resources."
- "No proven means exist at present that will allow ongoing human activity in the Basin and maintain groundwater salinity at current levels throughout the Basin. Accordingly, the water quality objectives for groundwater salinity control the rate of increase."
- "The maximum average annual increase in salinity measured as electrical conductivity shall not exceed the values specified in Table III-4 for each hydrographic unit shown on Figure III-1."
- "The average annual increase in electrical conductivity will be determined from monitoring data by calculation of a cumulative average annual increase over a 5-year period."

The maximum average increase in EC allowed varies by hydrographic unit, ranging from 1 microseimen per centimeter (µS/cm) to 6 µS/cm in the west side (north and south) and Tule River and Pose hydrographic units, respectively.

Additional Salinity-Related Objectives for Inland Surface Waters

In addition to the above described EC and TDS objectives for protection of MUN and AGR beneficial uses, both Basin Plans contain water quality objectives for EC and TDS for inland surface waters that are not tied to a named beneficial use, but were developed to protect the most sensitive beneficial use at the time of development.

The Sacramento-San Joaquin Basin Plan, Table III-3, lists site-specific salinity objectives for inland surface waters for:

- EC for portions of the Sacramento River, Feather River (including North Fork and Middle Fork), and San Joaquin River, expressed as a 50th percentile and 90th percentile for the Sacramento River, and a 90th percentile for the Feather River and San Joaquin River; and
- TDS for the American River (including North Fork, Middle Fork, and South Fork) and Folsom Lake, expressed as a 90th percentile.

To the extent of any conflict with the Chemical Constituents objectives, the more stringent shall apply.

The Tulare Basin Plan contains a general salinity objective, which states, "Waters shall be maintained as close to natural concentrations of dissolved matter as is reasonable considering careful use of the water resources." In addition, the Tulare Basin Plan contains site-specific objectives for EC for specific locations on the Kings, Kaweah, Tule, and Kern rivers that are expressed as maximum, 90th percentile, median, and mean values.

San Joaquin River Salt and Boron Control Program

The goal of the San Joaquin River Salt and Boron Control Program is to achieve compliance with salt and boron water quality objectives without restricting the ability of dischargers to export salt out of the San Joaquin River Basin. The San Joaquin River Salt and Boron Control Program has three specific purposes (Central Valley Water Board, 2004):

1. "To identify and quantify the sources of salt and boron loading to the river;
2. To determine the load reductions necessary to achieve attainment of applicable water quality objectives in order to protect the beneficial uses of water; and
3. To allocate salt and boron loads to the various sources and source areas within the watershed which, once implemented, will result in attainment of applicable water quality objectives."

To account for differences in salt and boron loading between different geographic areas, the watershed was divided into seven component subareas so that salinity management practices could be site specific. Using existing salt and boron water quality objectives for the Lower San Joaquin River at the Airport Way Bridge near Vernalis as a numeric target (Table 2-10), the TMDL established waste load allocations for point sources and load allocations for nonpoint sources in the Lower San Joaquin River watershed. A linkage analysis of electrical conductivity and boron showed that compliance with the salt load allocations is expected to result in attainment of the boron objectives. The Central Valley Water Board is to use waivers of WDRs or WDRs to apportion load allocations to the seven component subareas. In lieu of strict salt load allocations under WDRs, dischargers may participate in a Central Valley Water Board-

approved Real Time Salinity Management Program. Participation in an approved Real Time Salinity Management Program and attainment of permit requirements at Vernalis constitutes compliance. The Central Valley Water Board approved a Real Time Salinity Management Program in December 2014.

Table 2 - 10. Salt Water Quality Objectives at Vernalis and Boron Water Quality Objectives for the Lower San Joaquin River Between the Mouth of the Merced River and Vernalis

Parameter	Season	
	Irrigation Season (Apr 1 – Aug 31 salinity) (Mar 15 – Sep 15 boron)	Non Irrigation (Sep–Mar 31 salinity) (Sept 16–Mar 14 boron)
Salinity (EC) [a]	700 µS/cm	1,000 µS/cm
Boron [b]	0.8 mg/L (2.0 monthly maximum)	1.0 mg/L (2.6 monthly maximum)
Boron Critically Dry Water Years	1.3 mg/L	1.3 mg/L
Notes: [a] Expressed as maximum 30-day running average. [b] Expressed as monthly mean.		

Salinity water quality objectives for the Lower San Joaquin River upstream of Vernalis to the mouth of the Merced River are being addressed through the second phase of the Control Program's implementation. Salinity objectives were adopted by the Central Valley Water Board through Resolution R5-2017-0062 and approved by the State Water Board through Resolution No. 2018-0002 on 9 January 2018. The upstream salinity objectives include interim salinity objectives to be applied during extended dry periods. Specific requirements are noted in Table 2-11 and narratively below. The amendment will be fully effective after USEPA approval. Development of the upstream salinity objectives served as a case study to determine guidelines for interpreting appropriate salinity concentrations when evaluating protection of AGR as well as the development of interim limits during extended dry periods.

Table 2 - 11. LSJR Reach 83 WQOs and Performance Goal (PG) for Seasonal and Water Year Considerations (µS/cm) during Non-Extended Dry Periods.

Water-Year Type	Irrigation Season		Non-irrigation Season
	March – June	July - September	October - February
Wet	**1,350 (PG)** & 1,550 (WQO)		1,550 (WQO)
Above Normal	**1,350 (PG)** & 1,550 (WQO)		1,550 (WQO)
Below Normal	**1,350 (PG)** & 1,550 (WQO)	1,550 (WQO)	
Dry	**1,350 (PG**) & 1,550 (WQO)	1,550 (WQO)	
Critical	1,550 (WQO)		

An Extended Dry Period definition was established using the State Water Board's San Joaquin Valley "60-20-20" Water Year Hydrologic Classification[29] included in revised Water Right Decision 1641 to assign a numeric indicator to a water-year type as follows (State Water Board, 2000):

- Wet – 5
- Above Normal – 4
- Below Normal – 3
- Dry – 2
- Critically Dry – 1

The indicator values would be used to determine when an Extended Dry Period is in effect:

- An Extended Dry Period shall begin when the sum of the current year's 60-20-20 indicator value and the previous two year's 60-20-20 indicator values total six (6) or less.
- An Extended Dry Period shall be deemed to exist for one water year (12 months) following a period with an indicator value total of six (6) or less.
- Interim limits during an Extended Dry Period are:
    - 2,200 uS/cm EC as an annual average to protect MUN
    - 2,470 uS/cm EC as a 30-day running average to protect AGR

Consideration of Natural Background Concentration

Consideration of the natural background concentration of a constituent relative to a water quality objective is addressed in each Basin Plan as follows:

- The Tulare Basin Plan states, "The objectives of this plan do not require improvement over naturally occurring background concentrations."

- The Sacramento-San Joaquin Basin Plan states, "These objectives do not require improvement over naturally occurring background concentrations."

- Both Basin Plans include the following text within Chapter 4 of the Basin Plans (Policy

[29] The method for determining the San Joaquin Valley Water Year Hydrologic Classifications (e.g., critical, dry, below normal, above normal, wet) is defined in the SWRCB Revised Decision 1641, March 2000, Figure 2, page189. This method uses the best available estimate of the 60-20-20 San Joaquin Valley water year hydrologic classification at the 75% exceedance level using the best available data published in the California Department of Water Resources' ongoing Bulletin 120 series.

> for Application of Water Quality Objectives): "However, the water quality objectives do not require improvement over naturally occurring background concentrations. In cases where the natural background concentration of a particular constituent exceeds an applicable water quality objective, the natural background concentration will be considered to comply with the objective.

The Tulare Basin Plan also includes specific salinity implementation provisions in Chapter 4 governing consumptive use and controlled degradation. In particular:

- Discharges to Navigable Waters "…shall not exceed the quality of the source water plus 500 micromhos per centimeter or 1,000 micromhos per centimeter, whichever is more stringent…."

- For Discharges to Land "… maximum EC shall not exceed the EC of the source water plus 500 micromhos/cm."

- Water quality objectives for groundwater salinity are based on a maximum average annual increase measured as electrical conductivity, recognizing that, "no proven means exist at present that will allow ongoing human activity in the Basin and maintain groundwater salinity at current levels in the Basin."

San Francisco Bay/Sacramento-San Joaquin Delta Water Quality Control Plan

The *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary* (or Bay-Delta Plan) establishes water quality control measures that contribute to the protection of the beneficial uses of the Delta. As with other state water quality control plans, the Bay-Delta Plan identifies the beneficial uses to be protected, the water quality objectives for reasonable protection of the beneficial uses, and a program of implementation for achieving the water quality objectives. Elements of the Bay- Delta Plan include export-to-inflow ratios intended to reduce entrainment of fish at the export pumps, Delta Cross Channel gate closures, minimum Delta outflow requirements, and San Joaquin River salinity and flow standards. The Bay-Delta Plan contains specific numeric water quality objectives for chloride and EC at various locations in the Delta. Chloride objectives are for protection of municipal and industrial beneficial uses and EC objectives are protection of agricultural and fish and wildlife beneficial uses.

The Bay-Delta Plan includes water quality objectives for EC for the South Delta. The EC objectives are 30-day running average mean daily EC of 0.7 mmhos/cm for April 1 through August 30 and 1.0 mmhos/cm for September 1 through March 31. On 1 June 2011, the Superior Court for Sacramento County entered a judgment and peremptory writ of mandate in the matter of *City of Tracy v. State Water Resources Control Board* (Case No; 34-2009-8000-392-CU-WM-GDS), ruling that the South Delta salinity objectives shall not apply to the City of Tracy and other municipal dischargers in the South Delta area pending reconsideration of the South Delta salinity objectives under Water Code section 13241 and adoption of a proper program of implementation under Water Code section 13242 that includes municipal dischargers.

Policies and Regulatory Provisions Incorporated into the Basin Plans Related to Salt and Nitrate Management

The policies that have been incorporated into the Basin Plans are considered in detail in Section 6.0 Consistency with Laws, Plans and Policies.

Regulatory Provisions: Specific Requirements Regarding Salinity, Nitrate and Secondary MCL Parameters

A review of current regulatory provisions to govern wastewater discharges is provided in Appendix C. Special provisions related to salinity, nitrate and/or SMCL parameters are repeated below.

Surface Water

Municipal Wastewater

Most Central Valley wastewater NPDES permits include an effluent limitation for EC. The EC limitation is typically an annual average based on current performance. Water conservation and recent drought have led to reduced flows to municipal wastewater treatment plants, which in some cases have resulted in increasing concentrations of salinity-related parameters, such as EC. However, in many cases, the total load of salts discharged remains relatively constant.

Therefore, performance-based limitations may increase without resulting in any increase in load to the receiving water.

Municipalities also have a provision in their permits to develop and implement a salinity minimization and evaluation plan or salinity source control program to minimize salinity in effluent discharges.

Effluent limitations are also included for nitrate in some permits. Discharges found to have reasonable potential to cause or contribute to the exceedance of the primary MCL for nitrate in a receiving water designated as supporting the MUN beneficial use will be given an effluent limitation for nitrate set equal to the MCL of 10 mg/L-N, particularly where water bodies are considered impaired for nutrients.

In addition, non-salinity secondary MCL parameters (e.g., manganese, iron, and aluminum) that may be found at levels of concern in municipal wastewater also will be assigned effluent limitations. Turbidity is usually controlled through operational specifications or through a receiving water limit.

There are TMDLs for salt and boron applicable to the Lower San Joaquin River that also contain requirements for managing salts.

Industrial

Hatchery discharges to surface water have limitations included for EC and TDS based on each Basin Plan and groundwater limitations are specified for nitrate (10 mg/L-N) and TDS (500 mg/L).

Stormwater Municipal Permit

The technology-based standard for implementation of municipal storm water management programs to reduce pollutants in storm water is specified in Clean Water Act section 402(p)(3)(B)(iii), which requires that municipal stormwater permits " require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as

the Administrator or the State determines appropriate for the control of such pollutants." MEP is the cumulative effect of implementing, evaluating, and making corresponding changes to a variety of technically appropriate and economically feasible BMPs, ensuring that the most appropriate controls are implemented in the most effective manner. To achieve the MEP standard, municipalities must employ whatever BMPs are technically feasible and are not cost prohibitive.

The primary location for parameter-specific requirements is within the TMDL portion of the general permits. The permits include TMDLs that have been adopted by the Central Valley Water Board or USEPA for pollutant specific issues within water bodies or segments of water bodies in the Central Valley region. All permittees that are assigned a waste load allocation or identified as a responsible party where urban runoff is listed as the source must comply with the requirements as specified within the permit. Currently, there are no adopted TMDLs for salinity, nitrate or secondary MCL parameters that are applicable to MS4s in the Central Valley. The Lower San Joaquin River Salt and Boron TMDL concluded that stormwater contributes negligible salinity loads to the Lower San Joaquin River; less than one quarter of one percent of the river's total salt load as measured at the Airport Way Bridge near Vernalis (Central Valley Regional Water Quality Control Board 2004).

Stormwater Industrial General Permit (IGP)

While the IGP monitoring program includes some salinity, nitrate, or secondary MCL-related analytical parameters based on the type of industrial facility, the IGP does not contain specific programs or studies directed at these parameters. The following IGP requirements would trigger monitoring for salinity, nitrate, or secondary MCL-related analytical parameters:

- Facilities subject to additional analytical parameters identified in IGP Table 1;
- Facilities that identify these parameters on a facility-specific basis that serve as indicators of the presence of all industrial pollutants identified in the pollutant source assessment;
- Facilities that identify these parameters associated with the industrial source assessment related to receiving waters with CWA section 303(d) listed impairments or approved TMDLs; and
- Additional parameters required by the Central Valley Water Board.

These parameters may also be identified within the TMDL portion of the IGP. The IGP includes TMDLs that have been adopted by the applicable regional water quality control board or USEPA for pollutant specific issues within water bodies or segments of water bodies throughout the state that are applicable to industrial dischargers. Currently, there are no TMDLs listed for Region 5. The State Water Board is in the process of amending the IGP to incorporate TMDL-specific requirements.

Irrigated Agriculture

The Irrigated Lands Regulatory Program (ILRP) was created to address discharge of wastes (e.g., pesticides, nitrate, turbidity, etc.) from commercially irrigated lands. The goals of the ILRP are to protect surface water and groundwater and to reduce impacts of irrigated agricultural discharges to waters of the state. This is done by issuing WDRs directly to growers or through a coalition-based permitting program. The ILRP's WDRs contain conditions requiring water quality

monitoring of receiving waters and corrective actions when impairments are found. Options for regulatory coverage include joining a coalition, obtaining coverage as an individual grower under general WDRs, or obtaining an individual permit. All growers are required to submit a farm evaluation, either to their coalition or the Central Valley Water Board. The farm evaluation helps determine what farm practices are currently being implemented and whether any improvements can be made to protect water quality. Growers in areas where groundwater is susceptible to pollution or is known to be impacted by nitrate or other constituents associated with agriculture are required to have a certified nitrogen management plan. The number of acres of agricultural land enrolled in the ILRP is about six million acres and the number of growers enrolled is approximately 30,000.

Receiving water limitations are applied to surface water as narrative objectives stating that wastes discharged from coalition member operations shall not cause or contribute to an exceedance of a water quality objective. Trigger limits are established for constituents of concern. If the trigger is exceeded two or more times in a three-year period at a given sampling location, then a surface water quality management plan must be developed and implemented. A time schedule for addressing the water quality problem is required to be included in the surface water quality management plan and may not exceed ten years.

Dairies

Dairies in the Central Valley are regulated by General Order R5-2013-0122 that include requirements for testing wells, applying fertilizer and manure to crops at agronomic rates, and meeting standards for properly storing and handling manure to minimize leaching and runoff. Requirements cover the facilities where animals are housed, waste facilities, and associated croplands. Discharges of dairy wastes to surface waters is prohibited under the General Order.

Groundwater

Municipal Wastewater

Central Valley WDRs generally include effluent limitations for TDS or EC, and nitrate. In addition, if necessary, effluent limitations are established on a case-by-case basis for other constituents with secondary MCLs. Groundwater limitations are also established such that effluent will not cause an exceedance of a water quality objective or MCL in the groundwater. In addition, specific wells may be designated for determining compliance with groundwater limitations.

Effluent limitations are often included for nitrate or total nitrogen. In the Tulare Lake Basin, effluent limitations for EC are set equal to 1,000 µmhos/cm or set equal to source water EC concentration plus 500 µmhos/cm, whichever is more stringent. Effluent limitations may also be set for secondary MCLs to support the MUN beneficial use. In addition, effluent limitations for salts (e.g., sodium, chloride, boron) may be established to protect the AGR beneficial use.

Industrial

Effluent limitations for TDS are established as performance-based annual average limitations. For dischargers with levels of nitrogen that are a concern, nitrogen limitations are generally expressed as the nitrogen mass loadings that will not exceed the agronomic rate when applied to land application areas. Groundwater limitations are set depending on the ambient groundwater quality. Solids, salinity or nitrogen management plans may be required. Other

forms of requiring assessments of salt and nitrate include biochemical oxygen demand and nitrogen application and irrigation management reports and/or groundwater limitation compliance assessment plans. Monitoring for TDS, nitrate, MCLs and standard minerals in effluent and groundwater is also generally required.

Oil Field Program

The Oil Field Program regulates four primary oil field-related activities: well development drilling mud disposal, production well produced water disposal and reuse, underground injection control (UIC) practices, and well stimulation practices under Senate Bill 4 (or SB 4). Permits cover discharges of drilling muds, discharges of produced wastewater, including, but not limited to, discharges to ponds, discharges to roads for dust control, irrigation with produced water; and discharges of solids mixed with clean soil as road mix and berm material. These activities are generally regulated under individual and general waste discharge requirements (WDRs). The activities are regulated based on the quality of the discharged wastewater and the quality of the receiving waters, in most cases, groundwater. Unpermitted discharges, spills, and other illicit discharges are subject to enforcement actions by the Board.

The federal Safe Drinking Water Act (SDWA) regulates the injection of wastes associated with oil and natural gas operations into underground formations through Class II injection wells, referred to as the UIC Program. Oil field wastes may only be injected into aquifers that are not classified as underground sources of drinking water under the SDWA. The California Department of Conservation, Division of Oil, Gas, and Geothermal Resources (DOGGR) has regulatory primacy over the UIC program. The Central Valley Water Board and State Water Board coordinate with DOGGR on aquifer exemption applications and UIC project approvals to ensure the protection of water quality.

DOGGR and the Central Valley Water Board and State Water Board also coordinate on the regulation of well stimulation activities, including hydraulic fracturing, pursuant to SB 4 statutory authority. SB 4 requires, as of July 2015, that groundwater monitoring or an exclusion from monitoring must be in place prior to well stimulation. Staff review well stimulation applications, proposed monitoring plans, and proposed groundwater monitoring exclusions to ensure that well stimulation treatments and activities will not adversely affect water quality

Irrigated Agriculture

The WDRs require each member to develop a farm-specific nitrogen management plan. There are no specific requirements for salts or other constituents regulated by secondary MCLs.

Triggers have been established for TDS (450 mg/L for the East San Joaquin Watershed Coalition and 125 mg/L for the Sacramento River Watershed Coalition) and nitrate (10 mg/L-N for the East San Joaquin Watershed Coalition) as stated in the monitoring and reporting program. If the trigger is exceeded, then a surface water quality management plan or groundwater quality management plan must be developed. Depending on the location or region, triggers are also established for other constituents with secondary MCLs. The WDRs also note that actions associated with achieving compliance with water quality objectives for salts and nitrate should be coordinated with the policies and actions of CV-SALTS.

Dairies

Groundwater limitations are narrative, and state that the discharge of waste at existing milk cow dairies shall not cause the underlying groundwater to exceed water quality objectives, unreasonably affect beneficial uses, or cause a condition of pollution or nuisance. The General Order contains requirements associated with the management of nutrients, solids and salinity. Milk cow dairies regulated under the General Order are currently under a time schedule under which they are collectively evaluating the effectiveness of their management practices. After the evaluation is complete, dairies regulated under the General Order will be required to upgrade their management practices (if such practices are found not to be protective of underlying groundwater) on a time schedule that is as short as practicable, but that shall not extend beyond 2029.

2.3 Salt and Nitrate Issues Identified and Constraints Under Current Regulatory Framework

Salinity Issues

Salt moves with water and in the highly modified Central Valley, water from the Sacramento and San Joaquin River Basins travels to the Sacramento-San Joaquin Delta where it is exported to both the San Joaquin River and Tulare Lake Basins as well as to the Central Coast and Southern California (Figure 2-9). Water imported from the Sacramento-San Joaquin Delta brings an average of 250 tons of salt a day into the San Joaquin Valley via the State and Federal water project canals. With limited or no outlet to the ocean, more salt is being imported into the San Joaquin Valley than is being exported, with estimates that approximately 2 million tons of salt accumulate in the San Joaquin Valley every year (Central Valley Water Board, 2006). Salts are conservative, so when water is consumed through use, the majority of its salt load remains at or near the site of consumption. When water is reused, salinity increases as each use subjects the water to evaporation. Climate change is anticipated to exacerbate increasing salinity concentrations, as there is a reduction in freshwater dilution flows and increased reuse and conservation of available supplies.

Two major issues must be addressed with salt management: near-term impacts from elevated concentrations, and, long-term impacts from displacing large loads of salt into areas where they can accumulate – the soil profile and ground water. Elevated concentrations impact beneficial uses of the water body in question. Two beneficial uses sensitive to elevated salinity concentrations include agricultural irrigation and stock watering supply (AGR) and municipal and domestic supply (MUN). Select species of fish (green and white sturgeon as well as striped bass) are also sensitive to elevated salinity concentrations, especially during spawning (Klimley, et al., 2015). Fifty-one Central Valley surface water bodies were identified as impaired by salinity in the 2014-2016 Draft Integrated Report with the majority of those water bodies located in the San Joaquin River Basin (State Water Board, 2017).

Since salt is conservative, once the groundwater concentrations are elevated, the only means of reducing the concentrations is pumping, removing the brine and re-injecting the treated water, or providing alternative freshwater supplies (such as through stormwater recapture) to dilute the elevated levels.

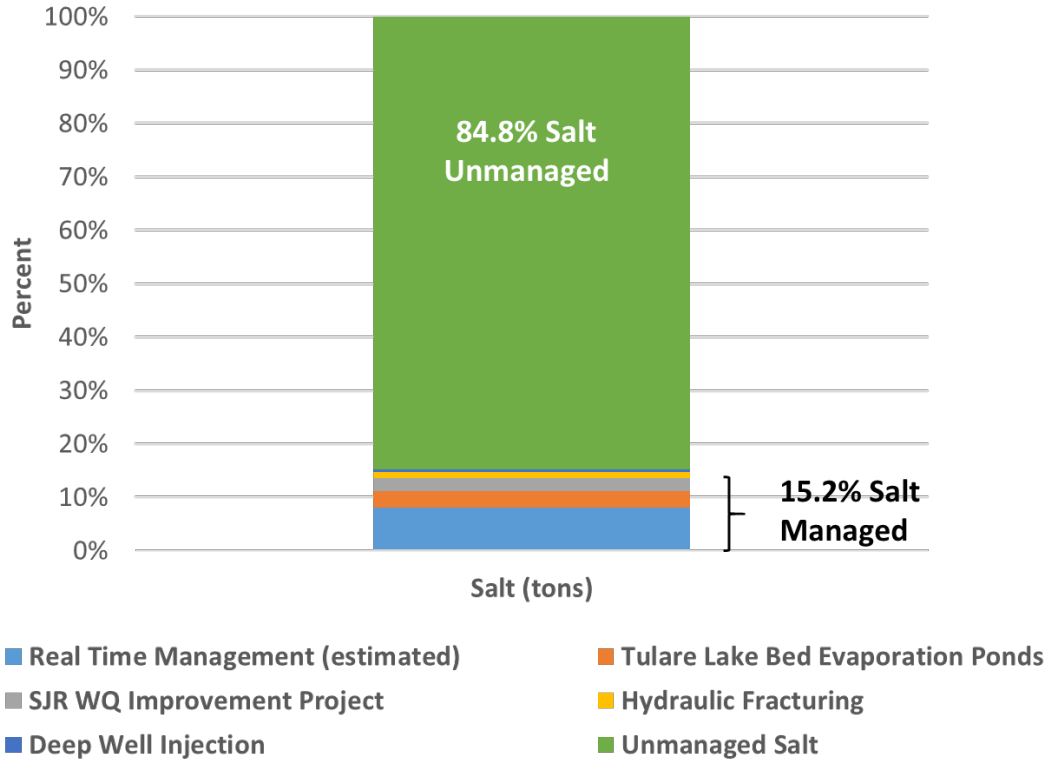
The CV-SALTS initiative conducted phased studies as part of the Strategic Salt Accumulation and Land Transport Study (CDM Smith, 2013) (CDM Smith, 2014) (CDM Smith, 2016b). The three phases: 1) identified and characterized existing salt accumulation study areas; 2)

developed potential salt management strategies; and 3) evaluated potential salt disposal alternatives to identify acceptable alternatives for future management. The conclusions of the studies noted, in part, that maximizing current management, treatment and disposal options such as deep well injection, utilizing available assimilative capacity, and reducing anthropogenic sources, would only address approximately 15% of the salt load in the identified salt accumulation study areas such as the westside of the San Joaquin River Basin and Tulare Lake Bed. Unless specific changes were made to the overall infrastructure of the Central Valley to allow movement of salts away from salt sensitive areas and eventually out of the valley, roughly 85% of the accumulating salt would continue to remain unmanaged with continued impacts to beneficial uses (Figure 2-10).

Figure 2 - 9. Central Valley Surface Water Flows



Figure 2 - 10. Bar Graph of Managed/Unmanaged Salt



Nitrate Issues

The CV-SALTS initiative conducted a Nitrate Implementation Measures Study (CDM Smith, 2016a) to evaluate means of reducing current ambient nitrate groundwater concentrations to protect and restore beneficial uses. The NIMS effort broadly evaluated alternatives for providing safe drinking water supplies to impacted groundwater users as well as alternatives to restore groundwater basins utilizing targets of 4 mg/L, 5 mg/L, 8 mg/L and 10 mg/L nitrate as nitrogen. The alternatives evaluated to restore groundwater basins and associated their associated costs are listed in Table 2-12. The 10 mg/L nitrate as nitrogen is the current maximum contaminant level to protect drinking water supplies. A pilot study was conducted within a 200-square mile irrigation district that had groundwater nitrate concentrations exceeding drinking water standards and impacting municipal and domestic supplies. The study estimated both timelines to meet targets within the groundwater basin as well as costs for restoration and cost for providing safe drinking water. Two broad scenarios (with several sub-scenarios using different assumptions for existing concentrations and pumping rates) were evaluated: pump, treat and reinject; and pump, treat and serve to meet potable demands. Based on initial results, the pump, treat, and serve sub-scenarios took longer to reach a performance target of 10 mg/L than the pump, treat and reinject scenarios (121 years vs 37 to 73 years). The pump, treat and serve options did provide treated water to meet potable demand and had significantly lower costs than the re-inject alternative, with an annual cost ranging from $2.2M to $8.7M as opposed to $5.9M to $14.2M.

Table 2 - 12. Concept Level Costs for Pump and Treat for Various Scenarios

Scenario	Treatment Type	Groundwater Treated (MGD)	Time to Reach Performance Target of 10 mg/L (years)[1]	Capital Low ($M)	Capital High ($M)	O&M Low ($M)	O&M High ($M)	Equivalent Annual Costs Low ($M)	Equivalent Annual Costs High ($M)
Scenario 1a	Reverse Osmosis	13.58	73	$106.9	$106.9	$8.0	$8.0	$14.2	$14.2
	Ion Exchange			$70.2	$87.4	$1.8	$4.3	$5.9	$9.3
	Biological Denitrification			$82.1	$87.8	$3.6	$4.6	$8.4	$9.7
Scenario 1b	Reverse Osmosis	27.16	37	$187.5	$187.5	$15.9	$15.9	$26.8	$26.8
	Ion Exchange			$114.1	$148.4	$3.6	$8.5	$10.2	$17.1
	Biological Denitrification			$137.8	$149.3	$7.2	$9.2	$15.2	$17.8
Scenario 2a	Reverse Osmosis	7.05	121	$53.0	$61.2	$3.1	$5.2	$6.2	$8.7
	Ion Exchange			$31.4	$49.5	$1.2	$3.2	$3.0	$6.1
	Biological			$40.4	$45.6	$0.8	$1.2	$2.2	$2.7
Scenario 2b	Reverse Osmosis	7.05	121	$47.8	$56.1	$3.1	$5.2	$5.9	$8.4
	Ion Exchange			$26.3	$44.3	$1.2	$3.2	$2.7	$5.8
	Biological Denitrification			$35.3	$40.5	$0.8	$1.2	$2.9	$3.5
Scenario 2c	Reverse Osmosis	7.05	121	$39.0	$46.4	$2.8	$4.6	$5.1	$7.3
	Ion Exchange			$25.3	$41.5	$1.2	$3.2	$2.6	$5.6
	Biological Denitrification			$27.8	$32.4	$0.8	$1.1	$2.4	$2.9
Scenario 2d	Reverse Osmosis	7.05	121	$50.3	$58.5	$3.1	$5.2	$6.0	$8.6
	Ion Exchange			$28.8	$46.8	$1.2	$3.2	$2.8	$5.9
	Biological Denitrification			$37.8	$43.0	$0.8	$1.2	$3.0	$3.7
Scenario 3	Reverse Osmosis	2.16	12 - 33	$16.8	$19.3	$1.0	$1.6	$1.9	$2.7
	Ion Exchange			$10.7	$16.3	$0.4	$1.0	$1.0	$1.9
	Biological Denitrification			$13.5	$15.1	$0.3	$0.4	$1.0	$1.2

Based on the findings, an Aggressive Restoration Study was initiated (Luhdorff & Scalmanini and Larry Walker Associates, 2016b). The aggressive restoration study focused on the same pilot area of the Tulare Lake Basin with elevated groundwater nitrate concentrations that were impacting local communities and domestic users. A more rigorous review was conducted

focused on reducing nitrate concentrations in two distinct areas directly impacting communities: a 10.25-square mile area near Dinuba and 7.8-square mile area near Cutler/Orosi. The baseline (Plan A) for the effort included increased irrigation efficiency, decreased nitrate loading, and enhanced on-farm winter recharge from November to March. The modeling then focused on increasing the number of extraction and recharge wells to allow for pumping, treating and reinjecting the treated water. In the Dinuba area 67 wells were added (26 extraction and 41 injection) and in the Cutler/Orosi area 11 wells were added (four extraction and seven injection). Three additional sensitivity alternatives were also evaluated: B) a 50% reduction in nitrate loading; C) increasing pumping and recharge rates by 1.5 to increase the hydraulic gradient; and D) doubling the pumping and recharge rates. Tables 2-13 and 2-14, show the number of years to reach targets of 5 mg/L and 7.5 mg/L nitrate as nitrogen under each alternative as well as the modeled concentrations in each of the Upper, Lower and Production Zones after 100-years of simulated time under each alternative, for the Dinuba and Cutler/Orosi areas, respectively. Time series maps from the study are included in Appendix B and depict the variability in groundwater quality at different depths. The simulation demonstrates areas that respond relatively quickly to reinjection and enhanced winter recharge with better water quality as well as areas that demonstrated movement of nitrate downward into lower zones in response to increased pumping and increased winter recharge. In addition to the extensive amount of time and cost involved in restoration of these case study areas, the Aggressive Restoration Study provided some conclusions and lessons learned when addressing the complexities of restoring groundwater basins with elevated nitrate concentrations including but not limited to:

- A targeted approach for restoration works better in smaller geographic settings where there is more control and knowledge about transport of water and nitrate mass. Larger regional areas contain too many complications from other pumping stresses (local, rural, urban, domestic) and lateral influxes to be practicable.

- On-farm recharge is advantageous for flushing the root zone with clean water, but can also result in displacement of existing poor shallow water quality

- On-farm and enhanced recharge are greatly dependent on the ability of the aquifer materials to accept additional water.

- Pump, treat and serve efforts are an excellent way to provide clean drinking water to communities, but the approach does not serve as a particularly beneficial tool for restoration.

- Restoration is not likely feasible on the scale of the Central Valley with current technology due to the number of additional extraction and injection wells needed. Localized priority areas may be ideal for such efforts, but the activities may take decades to result in satisfactory declines in impaired groundwater quality.

To expand on the last point, the Aggressive Restoration Study extrapolated the pump, treat and reinject option throughout the 200-square mile irrigation district using a simple mixing model to represent the complex hydrogeology of the groundwater aquifer to determine the number of additional extraction and injection wells that would be needed to reach a target concentration of 5 mg/L nitrate as nitrogen over a 20-year period. The result was a total of 1,600 new wells (615 extraction and 985 injection). At an estimated cost of $1.4 million/well, capital costs alone would exceed $2.24 billion.

Table 2 - 13. Summary of Dinuba Design Area Extraction/Injection Simulation Results

Aquifer Zone	Number of Years to Reach:								Nitrate Concentrations (mg/L as N)				
	5 mg/L as N				7.5 mg/L as N				Initial	After 100 Years of Simulation Time			
	Plan A	B	C	D	Plan A	B	C	D		Plan A	B	C	D
Upper Zone	-	-	-	-	-	-	-	-	19.9	23.8	12.8	11.4	10.0
Lower Zone	-	-	60	34	37	20	12	9	9.0	7.8	5.6	4.9	4.6
Production Zone	-	-	-	-	-	95	29	21	11.9	12.1	7.5	6.7	6.3

Table 2 - 14. Summary of Cutler/Orosi Design Area Extraction/Injection Simulation Results

Aquifer Zone	Number of Years to Reach:								Nitrate Concentrations (mg/L as N)				
	5 mg/L as N				7.5 mg/L as N				Initial	After 100 Years of Simulation Time			
	Plan A	B	C	D	Plan A	B	C	D		Plan A	B	C	D
Upper Zone	-	-	-	-	-	12	7	5	11.4	11.3	7.3	6.9	6.6
Lower Zone	-	23	14	11	-	-	-	-	6.0	5.5	4.5	4.1	4.0
Production Zone	-	-	-	-	-	3	2	2	8.6	8.3	5.9	5.5	5.2

Constraints Under Current Regulatory Authority

The Central Valley Water Board has broad regulatory authority to regulate discharges to surface waters and/or groundwater throughout the Central Valley Region in order to protect existing and potential uses of those water bodies. The framework for the regulation is documented in the Basin Plans, which designate beneficial uses for the surface waters and groundwater bodies, identify water quality objectives to protect those uses, specify the implementation measures to be taken to meet the objectives and provide the surveillance and monitoring requirements to evaluate results. The Basin Plans also identify the policies that must be considered when regulating dischargers. Discharge permit conditions must reflect Basin Plan requirements and guidelines. The current regulatory framework and process are documented in Section 2.2 and Appendix C.

The Basin Plans were first established in the early 1970's and utilized available information to designate beneficial uses in specific water bodies. When the Basin Plans were established, they broadly designated agricultural supply (AGR) in almost all groundwater basins. When the Central Valley Water Board incorporated the Sources of Drinking Water Policy into the Basin Plans, all surface waters and groundwater was designated as supporting the MUN use unless waters were already listed in the Basin Plans as a water body that does not support MUN. Surface streams that are not specifically named in the Basin Plans are considered to support

the beneficial uses of the first identified downstream water body. Any changes to these designations require amending the appropriate Basin Plan.

When regulating discharges to protect these and other beneficial uses, the current framework is primarily focused on source control from individual permit locations. The framework has been expanded to broader-based general orders for coalitions of growers representing broad regional areas and/or commodities under the Irrigated Lands Regulatory Program and the Dairy Program – but the focus is still source control. The current authorities were not designed to address the broad areas of elevated groundwater concentrations of salt or nitrate that occurred naturally or through the modern management of water supplies and generations of agricultural practices. Nor is the current regulatory framework structured to address the decades that restoration measures would need while still allowing for regulated discharges or account for changes in water quality that result from extended dry periods and/or drought which are expected to increase due to climate change or from continued reuse and recycling of limited water supplies.

For instance, nitrate farming practices have historically used nitrogen fertilizers to boost crop productivity. While current regulation is focused on farm management plans to apply at agronomic rates, treatment technologies are limited and not structured to apply to the vast aquifers currently impacted. Under the existing regulatory framework, discharges that exceed nitrate water quality objectives would be prohibited from discharging to groundwater aquifers that exceed water quality objectives – even if that discharge is of better quality than the impacted groundwater. Under Water Code section 13304, if the Board found that a permittee had caused or contributed to the nitrate pollution, the Board could order the permitee to clean up the aquifer and mitigate any damage to users of that aquifer. While desirable to do, the reality is that there is limited technology to address the legacy issues. Extremely high costs would be faced by permittees whose discharges would be legally prohibited due to their effects on groundwater, meaning that those dischargers that lacked the resources to simultaneously implement costly measures to treat their wastewater, undertake efforts to restore impacted aquifers, and mitigate the damages caused by past practices would be forced out of business.

Permittees discharging salt are faced by similar issues, but with less ability to control the source. Salt accumulation poses many challenges. Many city and regional wastewater facilities cannot meet current Basin Plan water quality objectives, industries struggle to comply with salinity limitations, which often places limitations on their growth, agricultural activities are limited and face increased costs due to the management of saline waters, and drinking water sources face increased challenges with consumer acceptance as salinity levels increase. Since any consumptive use increases the levels of salt, there is a need for broad-based management rather than point-by-point regulation in order to allow salt to be moved out of sensitive areas until it can be economically treated and disposed of or reused. While current regulatory authorities do not prohibit a basin-wide management approach, there is no systematic framework for moving forward. Reuse and conservation, while desirable and needed in times of scarcity, would be in conflict with current regulations that require that all discharges meet conservative salinity water quality objectives.

Examples of some of the inconsistencies and constraints to managing salt and nitrate in a broad based, sustainable manner under the current framework are identified below.

Implementation of Secondary MCLs to Protect MUN

Lack of guidance or policy in the Basin Plans for implementation of secondary MCL-based objectives has resulted in permitting and compliance challenges when implementing the secondary MCL-based water quality objectives for EC and TDS in WDRs for dischargers to

surface waters and groundwater, because often the lower "Recommended" value is used as the basis for establishing WDRs. In July 2009, the State Water Board adopted Order WQ 2009-0005, which remanded in part the City of Lodi NPDES permit and directed the Central Valley Water Board to consider further if releases of wastewater from the unlined storage ponds have caused groundwater to exceed applicable Sacramento-San Joaquin Basin Plan objectives for EC. In the order, the State Water Board noted that the Chemical Constituents narrative water quality objective in the SRSJR Basin Plan incorporates only the secondary MCLs specified in tables from Title 22 of the California Code of Regulations section 64449 with their numeric values and does not specifically reference the monitoring, reporting, waiver or other provisions that provide context for application of the values in those tables. The State Water Board also found that the "Short Term" value of 2,200 µS/cm EC (1,500 mg/L TDS) is not appropriate as an applicable water quality objective because it is "intended to apply only on a temporary basis pending construction of water treatment facilities or the development of new water sources."

The Chemical Constituents water quality objectives in Chapter 3 acknowledges that specific treatment requirements are imposed by state and federal drinking water regulations, however, the Basin Plans provide no implementation provisions for this text. Lack of guidance or policy in the Basin Plans for implementation of secondary MCL-based objectives does not clarify whether compliance with secondary MCL-based provisions in WDRs should be assessed conservatively using measurements of total recoverable fractions, or should be assessed using an alternative approach such as dissolved fraction or using a filtered sample that better represents water supplied to consumers after conventional treatment practices or groundwater that is naturally filtered through the soil profile. The Basin Plans also do not provide implementation guidelines for a compliance assessment time period for the secondary MCLs.

Interpreting Narrative Objectives to Protect AGR

To interpret the narrative Chemical Constituents objective for protection of the AGR beneficial use when developing WDRs, the Central Valley Water Board has, at times, used 450 mg/L as the threshold for TDS and 700 µmhos/cm for EC, which are based on guidelines in Ayers and Westcot (Ayers & Westcot, 1985). This guideline was developed to protect all crops at all times under all management practices. The guideline does not account for modern irrigation techniques or other limiting factors such as soil conditions or climate that may limit more salt sensitive crops.

The Central Valley Water Board, consistent with *In re Matter of the City of Woodland*, State Water Board Order No. WQO 2004-00 10 (2004), is required to consider site-specific factors, such as leaching by rainfall or flooding, local cropping patterns, etc., to the extent this data is available, in selecting an appropriate salinity values to implement the narrative chemical constituents objective and developing appropriate permit limits to control for salinity. To resolve the inconsistencies, provide clarity and/or provide the Central Valley Water Board with additional authority to evaluate and permit innovative solutions, requires amending the Basin Plans. Section 3.0 identifies specific laws, plans and policies that must be considered when amending a Basin Plan.

3 LAWS, REGULATION, AND POLICIES RELEVANT TO BASIN PLANNING

This staff report proposes amendments to the Basin Plan. There are a number of federal and state laws, regulations and policies that are specifically relevant to the Basin Planning process. This chapter summarizes these laws, regulations, and policies. Although all of the proposed Amendments will need to be adopted by the Central Valley Water Board and approved by the State Water Board and Office of Administrative Law (OAL) prior to becoming effective, not all the proposed amendments fall under federal jurisdiction and require approval by USEPA prior to becoming effective. The following list clarifies those amendments that will be effective after OAL approval and those that must receive USEPA approval in addition.

Table 3 - 1 Basin Plan Amendment Approval Requirements

Basin Plan Chapter	Basin Plan Amendment Component	Effective after approval from Office of Administrative Law	Effective after approval by U.S. Environmental Protection Agency
3 (Water Quality Objectives)	Revisions to Water Quality Objectives		
	o Application Water Quality Objectives – Fourth Point (revision)		X
	o Secondary Maximum Contaminant Levels (revisions)	X (for groundwater)	X (for surface water)
4 (Implementation)	Salt and Nitrate Control Program (new)		
	o Program to Control and Permit Salt Discharges to Surface and Groundwater	X (for groundwater components)	X (for surface water components)
	o Program to Control and Permit Nitrate Discharges to Groundwater	X	
	o Conditional Prohibition of Salt and Nitrate Discharges	X	
	o Surveillance and Monitoring Program	X	
	o Recommendation to Other Agencies	X	
	o Definitions and Terminology Specific to Salt and Nitrate Control Program	X (as applicable to groundwater components)	X (as applicable to surface water components)
	Supporting Policies		
	o Variance Policy (revised)		X
	o Exceptions Policy (revised)	X	
	o Drought and Conservation Policy (new)	X (for groundwater components)	X (for surface water components)

Basin Plan Chapter	Basin Plan Amendment Component	Effective after approval from Office of Administrative Law	Effective after approval by U.S. Environmental Protection Agency
	o Offsets Policy (new)	X	
	Application of Secondary Maximum Contaminant Levels to Protect Municipal and Domestic Supply (new)	X (as applicable to groundwater discharges)	X (as applicable to surface water discharges)
	Estimated Costs to Agriculture	X	
Appendix XX	Nitrate Control Program Non-Prioritized Groundwater Basins (new)	X	

3.1 Legal Requirements for Establishing and Amending the Basin Plan

In the Porter-Cologne Water Quality Control Act, the Legislature found and declared that activities and factors which may affect the quality of the waters of the state shall be regulated to attain the highest water quality which is reasonable, considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible.

The State Water Board and the nine Regional Water Quality Control Boards (Regional Water Boards) are the state agencies with primary responsibility for coordination and control of water quality. (Wat. Code, § 13000.) Each Regional Water Board is required to adopt a water quality control plan, or Basin Plan, which provides the basis for regulatory actions to protect water quality. (Wat. Code, § 13240 et seq.) Basin plans designate beneficial uses of water, water quality objectives to protect the uses, and a program of implementation to achieve the objectives. (Wat. Code, § 13050, subd.(j).) Basin plans, once adopted, must be periodically reviewed and may be revised. (Wat. Code, § 13240.)

Under the Federal Clean Water Act (CWA) (33 USC section 1251 et seq.), the states are required to adopt water quality standards for surface waters. (33 USC § 1313(c).) Water quality standards consist of: 1) designated uses and 2) water quality criteria necessary to protect designated uses. (33 USC § 1313 (c)(2)(A) and (c)(2)(B); Title 40 Code of Federal Regulations (CFR) §131.6.) Under the CWA, the states must review water quality standards at least every three years.

Regional Water Boards adopt and amend basin plans through a structured process involving peer review, public participation, and environmental review. Regional Water Boards must comply with the CEQA (Pub. Res. Code. § 21000 et seq.) when amending their basin plans. The Secretary of Natural Resources has certified the basin planning process as exempt from the CEQA requirement to prepare an environmental impact report or other appropriate environmental document. (Pub. Res. Code, § 21080.5; Cal. Code Regs., tit. 14, § 15251, subd. (g).) Instead, State Water Board regulations on its exempt regulatory programs require the Regional Water Boards to prepare a written report and an accompanying CEQA Environmental Checklist and Determination with respect to Significant Environmental Impacts. (CEQA Checklist) (Cal. Code Regs., tit. 23, § 3775 et seq.)

The Central Valley Water Board's environmental review of the proposed Basin Plan Amendments is contained in this Staff Report, in particular Section 7.0, Section 8.0, and Appendix K, which is considered to be part of the SED.

Basin Plan amendments are not effective until they are approved by the State Water Board and the regulatory provisions are approved by the State OAL. The USEPA also must review and approve amendments that add or modify water quality standards for waters of the United States.

The next sections detail the laws, regulations, and policies that apply to Basin Planning and are relevant to the proposed amendments.

3.2 LEGAL REQUIREMENTS FOR ESTABLISHING, DESIGNATING AND MODIFYING BENEFICIAL USES

3.2.1 Federal Regulations and Guidance

Federal regulations require the protection of designated uses in waters of the United States. Federal regulations establish special protections for the uses specified in CWA section 101, subdivision (a)(2). CWA section 101, subdivision (a)(2) states that it is a national goal that wherever attainable, water quality should be sufficient "for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water." These uses are also referred to as "fishable/swimmable" uses.

Under 40 CFR section 131.10, subdivision (j), a state must conduct a "use attainability analysis" (defined in 40 CFR § 131.3, subd.(g).) whenever a state wishes to remove a designated fishable/swimmable use from a waterbody that falls within the jurisdiction of the CWA. 40 CFR section 131.10, subdivision (g) defines six circumstances where it would be appropriate for a state to remove a fishable/swimmable use.

When establishing, designating, or revising beneficial uses that are not "fishable/swimmable" beneficial uses (like the MUN beneficial use) in water subject to federal jurisdiction, states must submit documentation to USEPA justifying how their consideration of the use and value of water appropriately supports the state's action. A use and value demonstration consists of, at a minimum, a showing that the state has considered:

- Relevant descriptive information about the waterbody itself;
- The use and value of the waterbody as a public water supply (40 CFR 131.10, subd. (a).);
- The impact that the change could have on the protection and propagation of fish, shellfish, and wildlife (*Id.*);
- The impact that the change could have on recreation in and on the water (*Id.*);
- The use and value of the waterbody for agricultural, industrial, and other purposes, including navigation (*Id.*);
- The impact that the change in use could have on the protection of downstream uses (40 CFR 131.10, subd. (b).);
- Whether or not the use to be changed is an existing use in the waterbody (40 CFR 131.10, subd. (h)(1).); and

3.2.1.1 *Whether or not the beneficial use could be attained in the waterbody, using the factors in 40 CFR 131.10, subd. (g) as a general guide[30].*

As described below, many of these considerations are already required by state laws and regulations when the Board considers a change to a beneficial use designation in any waterbody, not just those waterbodies subject to federal jurisdiction. Therefore, the requirements of a "use and value" demonstration are largely satisfied whenever the Board considers a change to a beneficial use designation, irrespective of whether the water body is considered a "water of the United States" within the meaning provided by the CWA.

3.2.2 State Regulations and Guidance

The Water Code includes designation of beneficial uses in both basin plans and statewide plans. (Wat. Code, §13050, subd. (j).) The Water Code defines beneficial uses of water as including, but not limited to: "domestic, municipal, agricultural, and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves." (Wat. Code, §13050, subd. (f).)

Designated uses are those uses specified in the water quality standards for each water body or segment whether or not they are being attained. (40 CFR §131.3(f).) In Table II-1 of the Basin Plan, beneficial uses for listed water bodies within the Sacramento and San Joaquin River are identified as Existing, Limited, or Potential.

The Sacramento and San Joaquin River Basin Plan lists beneficial uses for surface water bodies (Table II-1). The beneficial uses of the Sacramento and San Joaquin River basins include: municipal and domestic supply (MUN), agricultural supply (AGR), industrial process supply (PRO), industrial service supply (IND), hydropower generation (POW), water contact recreation (REC-1), non-contact water recreation (REC-2), warm freshwater habitat (WARM), cold freshwater habitat (COLD), migration of aquatic organisms (MIGR), spawning, reproduction, and/or early development (SPWN), wildlife habitat (WILD), navigation (NAV), commercial and sport fishing (COMM), shellfish harvesting (SHELL),and preservation of biological habitats of special significance (BIOL).

All ground waters in the Sacramento and San Joaquin River basins are considered as suitable or potentially suitable, at a minimum, for municipal and domestic water supply (MUN), agricultural supply (AGR), industrial service supply (IND), and industrial process supply (PRO), unless otherwise designated by the Central Valley Water Board.

The Tulare Lake Basin Plan lists beneficial uses for surface water bodies (Table II-1) and groundwater (Table II-2).The beneficial uses of the Tulare Lake Basin include: municipal and domestic supply (MUN), agricultural supply (AGR), industrial service supply (IND), industrial process supply (PRO), hydropower generation (POW), water contact recreation (REC-1), non-contact water recreation (REC-2), warm freshwater habitat (WARM), cold freshwater habitat (COLD), wildlife habitat (WILD), spawning, reproduction, and/or early development (SPWN), migration of aquatic organisms (MIR), ground water recharge (GWR), freshwater replenishment (FRSH), aquaculture (AQUA), preservation of biological habitats of special significance (BIOL), and navigation (NAV).

The groundwater beneficial uses of the Tulare Lake Basin as listed in Table II-2 include: municipal and domestic supply (MUN), agricultural supply (AGR), industrial service supply

[30] USEPA Guidance materials (80 FR 51019) suggest the consideration of the 40 CFR 131.10(g) circumstances that could warrant the removal of a "fishable/swimmable" beneficial use when the state submits a "use and value" demonstration, even though "use and value" demonstrations are required when the state is providing a justification for a change in *non*-fishable/swimmable beneficial use designations.

(IND), industrial process supply (PRO), water contact recreation (REC-1), non-contact water recreation (REC-2), and wildlife habitat (WILD). Groundwater areas exempted from MUN are footnoted in Table II-2. Unless otherwise designated by the Central Valley Water Board, all ground waters in the Region are considered suitable or potentially suitable, at a minimum, for agricultural supply (AGR), industrial supply (IND), and industrial process supply (PRO) (Basin Plan pg. II-2).

Page II-1.00 of the Basin Plan describes several points that need to be considered in setting and protecting beneficial uses:

- *"All water quality problems can be stated in terms of whether there is water of sufficient quantity or quality to protect or enhance beneficial uses".*
- *"Beneficial uses do not include all of the reasonable uses of water. For example, disposal of wastewaters is not included as a beneficial use. This is not to say that disposal of wastewaters is a prohibited use of waters of the State; it is merely a use which cannot be satisfied to the detriment of other beneficial uses. Similarly, the use of water for the dilution of salts is not a beneficial use although it may, in some cases, be a reasonable and desirable use of water."*
- *"The protection and enhancement of beneficial uses require that certain quality and quantity objectives be met for surface and ground waters."*
- *"Fish, plants, and other wildlife, as well as humans, use water beneficially."*

Beneficial use designation (and water quality objectives, see Chapter III of the Basin Plan) must be reviewed at least once during each three-year period for the purpose of modification as appropriate (40 CFR 131.20)."

3.2.3 State Water Board Sources of Drinking Water Policy (Resolution 88-63)

The *Sources of Drinking Water Policy* establishes state policy that all waters are considered suitable or potentially suitable to support the MUN beneficial use, with certain exceptions.

The Basin Plan implements *Sources of Drinking Water Policy* by assigning the MUN beneficial use to all water bodies that do not have their individual uses specifically listed in Table II-1. Exceptions to the MUN designation through *Sources of Drinking Water Policy* are allowed in surface water for:

1. Surface and ground waters where:
    a. The TDS exceed 3,000 mg/L (5,000 uS/cm, EC) and it is not reasonably expected by Regional Boards to supply a public water system, or
    b. There is contamination, either by natural processes or by human activity (unrelated to the specific pollution incident), that cannot reasonable be treated for domestic use using either Best Management Practices or best economically achievable treatment practices, or
    c. The water source does not provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day.
2. Surface waters where:

a. The water is in systems designed or modified to collect or treat municipal or industrial wastewaters, process waters, mining wastewaters, or storm water runoff, provided that the discharge from such systems is monitored to assure compliance with all relevant water quality objectives as required by the Regional Boards; or,

b. The water is in systems designed or modified for the primary purpose of conveying or holding agricultural drainage waters, provided that the discharge from such systems is monitored to assure compliance with all relevant water quality objectives as required by the Regional Boards.

The *Sources of Drinking Water Policy* addresses only designation of water as drinking water sources; it does not establish objectives for constituents that are protective of the designated MUN use.

A water body only needs to meet one of the exceptions to be eligible to have the MUN beneficial use removed. However, water bodies designed or modified for the primary purpose of conveying or holding agricultural drainage, as described in Exception 2b, may meet additional *Sources of Drinking Water Policy* exceptions. For example, water bodies that meet the Exception 2b criteria may also meet the Exception 1b criterion, which allows the de-designation of the MUN beneficial use in waters where there "is contamination, either by natural processes or by human activity (unrelated to a specific pollution incident), that cannot reasonably be treated for domestic use using either Best Management Practices or best economically achievable treatment practices."

3.3 Laws that Apply to the Establishment of Water Quality Objectives

3.3.1 Federal Regulations and Guidance

Federal regulations require States to adopt narrative or numeric water quality criteria to protect designated beneficial uses in water bodies subject to federal jurisdiction (40 CFR §131.11(a)(1).) When establishing, designating, or revising beneficial uses that are not "fishable/swimmable" beneficial uses (like the MUN beneficial use), 40 CFR section 131.10, subdivision (a) requires that states take into consideration the use and value of the water body or water bodies where the beneficial use will be modified. The considerations that must be made as part of a "use and value" determination are described in section 3.1.1 of this Staff Report.

3.3.2 State Statute, Regulations and Guidance

Water Code section 13050, subdivision (h) defines water quality objectives as "…the limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area." Pursuant to Water Code section 13241, when establishing WQOs, the Central Valley Water Board is required to consider:

(a) Past, present, and probable future beneficial uses of water;
(b) Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto;
(c) Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area;
(d) Economic considerations;

(e) The need for developing housing within the region;
(f) The need to develop and use recycled water; and
(g) The Program of Implementation (Wat. Code, §13242)

Note that some of the above factors such as (a) through (d) have elements that overlap with the considerations that support a use and value demonstration under 40 CFR section 131.10, subdivision (a).

3.4 Laws that Apply to the Establishment of an Implementation Program in the Basin Plan

3.4.1 Federal Regulations and Guidance

Section 402 of the CWA requires a permitting system which USEPA addressed by promulgating 40 CFR, part 122, which are the regulations pertaining to the NPDES program. The State's regulations pertaining to NPDES permits must be consistent with the federal regulations.

40 CFR section 122.44, subd. (d)(1)(ii) sets forth the criteria for establishing a procedure for determining whether a discharge has a reasonable potential to cause or contribute to a violation of water quality standards. It states, "When determining whether a discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above a narrative or numeric criteria within a State water quality standard, the permitting authority shall use procedures which account for existing controls on point and nonpoint sources of pollution, the variability of the pollutant or pollutant parameter in the effluent, the sensitivity of the species to toxicity testing (when evaluating whole effluent toxicity), and where appropriate, the dilution of the effluent in the receiving water." While the federal regulations do not contain explicit procedures to derive effluent limitations, USEPA has provided guidance (United States Environmental Protection Agency, 1991) that includes explicit procedures.

3.4.2 State Statues, Regulations, and Guidance

3.4.2.1 Water Code sections 13050 and 13242

Pursuant to Water Code section 13050, subdivision (j)(3), a basin plan amendment must include an implementation program to achieve water quality objectives. Water Code section 13242 dictates that a program of implementation must include the following:

- description of the actions necessary to achieve the water quality objectives;
- a time schedule for the actions to be taken; and
- a monitoring and surveillance program.

3.4.2.2 Water Code section 106.3

In compliance with Water Code section 106.3, it is the policy of the State of California that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes. (See section 3.7.2 for discussion.)

3.5 Economic Review

California Law requires a consideration of economics when: (i) establishing water quality objectives (Wat. Code, § 13241, subd. (d).); (ii) before implementing an agricultural water quality control program (Wat. Code, § 13141.); and (iii) when adopting an amendment that will require

the installation of pollution control equipment or is a performance standard or treatment requirement (Pub. Resources Code, § 21159.).

3.5.1 Water Code section 13241

Requires economics as one of the seven factors that must be considered when developing water quality objectives (See the fourth factor (d) in Section 3.2.2).

3.5.2 Water Code section 13141

Water Code section 13141 states that, "prior to implementation of any agricultural water quality control program, an estimate of the total cost of such a program, together with an identification of potential sources of financing, shall be indicated in any regional water quality control plan." Section 8.1.2 describes the costs for implementing agricultural water quality control program in the no-action alternative. Section 8.2.6 describes the identification of potential sources of financing and the need to develop a comprehensive and regional financial strategy.

3.5.3 Public Resources Code section 21159

Public Resources Code section 21159 requires that an agency must perform "an environmental analysis of the reasonably foreseeable methods of compliance" for "…a rule or regulation that requires the installation of pollution control equipment or a performance standard or treatment requirement…The environmental analysis shall take into account a reasonable range of environmental, economic, and technical factors, population and geographic areas, and specific sites."

3.6 ENVIRONMENTAL REVIEW – CEQA

The Central Valley Regional Water Quality Control Board, when acting as a Lead Agency under CEQA, is responsible for evaluating all the potential environmental impacts that may occur due to changes made to the Basin Plan. The Secretary of Resources has determined that the Central Valley Water Board's basin planning process qualifies as a certified regulatory program pursuant to Public Resources Code section 21080.5 and California Code of Regulations, title 14, section 15251(g). This determination means that the Central Valley Water Board's is exempt from the requirement to prepare an environmental impact report. Instead, this Staff Report and the Environmental Checklist provided in Appendix K satisfy the requirements of State Water Board's Regulations for Implementation of CEQA, Exempt Regulatory Programs, which are found at California Code of Regulations, title 23, sections 3775 et seq.

3.7 ANTIDEGRADATION POLICIES

The USEPA has established a federal antidegradation policy applicable to water quality programs in 40 CFR section 131.12 (*Federal Antidegradation Policy*). The State Water Resources Control Board has established an antidegradation policy for the State of California by adopting State Water Board Resolution 68-16, the Statement of Policy with Respect to Maintaining High Quality of Waters in California (*State Antidegradation Policy*). The Central Valley Water Board must ensure that its basin planning actions are consistent with the *Federal Antidegradation Policy* and the *State Antidegradation Policy*.

3.7.1 Federal Antidegradation Policy

The *Federal Antidegradation Policy* states:

(a) The State shall develop and adopt a statewide antidegradation policy and identify the methods for implementing such policy pursuant to this subpart. The antidegradation policy and implementation methods shall, at a minimum, be consistent with the following:

(1) Existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected.

(2) Where the quality of the waters exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected unless the State finds, after full satisfaction of the intergovernmental coordination and public participation provisions of the State's continuing planning process, that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. In allowing such degradation or lower water quality, the State shall assure water quality adequate to protect existing uses fully. Further, the State shall assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control.

(3) Where high quality waters constitute an Outstanding National Resource Waters, such as waters with exceptional ecological, recreational or environmental assets, that water quality shall be maintained and protected.

(4) In those cases where potential water quality impairment associated with a thermal discharge is involved, the antidegradation policy and implementing method shall be consistent with section 316 of the Act.

3.7.2 State Antidegradation Policy

The *State Antidegradation Policy* states, in relevant part:

(1) Whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality will be maintained until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water and will not result in water quality less than that prescribed in the policies.

(2) Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.

3.8 State Laws and Regulations Relevant to Salt and Nitrate Management

3.8.1 Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Wat. Code § 13000 et seq) is California's statutory authority for the protection of water quality. The act requires the nine regional water quality control boards to adopt water quality control plans, which must consist of designation of beneficial uses, water quality objectives, and a program of implementation for achieving

water quality objectives (Wat. Code §13050(j)). The implementation program for a basin plan must include: 1) a description of the nature of actions which are necessary to achieve the objectives, including recommendations for appropriate action by any entity, public or private; 2) A time schedule for the actions to be taken; and 3) a description of surveillance to be undertaken to determine compliance with the objectives. (Wat. Code § 13242.)

Water quality objectives are used to protect beneficial uses that require a certain level of water quality for the uses to be attained. The Porter-Cologne Water Quality Control Act defines water quality objectives as "…the limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area." (Wat. Code § 13050(h).) Water quality objectives may be stated in either numerical or narrative form. Water quality objectives may be applied on a geographic basis or applied to all waters within a surface water or groundwater resource for which beneficial uses have been designated.

The act also authorizes the State Water Board and regional water quality control boards to issue and enforce permits containing requirements for the discharge of waste to waters of the state, which is defined to mean "any surface water or groundwater, including saline waters, within the boundaries of the state." (Wat. Code § 13050(e).) Regional water quality control boards may authorize discharges of waste to waters of the state by issuing discharge requirements referred to as waste discharge requirements (WDRs) (Wat. Code § 13263.), or may issue waivers of discharge requirements. (Wat. Code § 13269.) Regional water quality control boards can also prohibit the discharge of certain types of wastes or the discharge of wastes in certain geographic areas. (Wat. Code § 13243.)

3.8.2 Human Right to Water

With the enactment of Water Code section 106.3, on September 25, 2012, California became the first state in the nation to recognize legislatively the human right to water, following two other state's recognition of the right in their respective constitutions. Water Code section 106.3 states, in full:

(a) It is hereby declared to be the established policy of the state that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes.
(b) All relevant state agencies, including the department, the state board, and the State Department of Public Health, shall consider this state policy when revising, adopting, or establishing policies, regulations, and grant criteria when those policies, regulations, and criteria are pertinent to the uses of water described in this section.
(c) This section does not expand any obligation of the state to provide water or to require the expenditure of additional resources to develop water infrastructure beyond the obligations that may exist pursuant to subdivision (b).
(d) This section shall not apply to water supplies for new development.
(e) The implementation of this section shall not infringe on the rights or responsibilities of any public water system."

The State Water Board adopted Resolution No. 2016-0010 on February 16, 2016, adopting "the human right to water as a core value and adopts the realization of the human right to water as a top priority for the Water Boards." The resolution includes a number of directives to State Water Board staff, including continued consideration of the human right to water in all activities that could affect existing or potential sources of drinking water, including revising

water quality control plans and policies and permitting. This resolution does not expand the legal scope of the human right to water as described in Water Code section 106.3, alter the State Water Board or Central Valley Water Board authority and obligations under applicable law, or impose new requirements on the regulated community. The Central Valley Water Board adopted a similar resolution on April 21, 2016 (Resolution R5-2016-0018).

3.8.3 Sustainable Groundwater Management Act

The Sustainable Groundwater Management Act, which went into effect January 1, 2015, gives local agencies the authorities to manage groundwater in a sustainable manner and allows for limited state intervention when necessary to protect groundwater resources. The act specifically:

- Establishes a definition of sustainable groundwater management.
- Establishes a framework for local agencies to develop plans and implement strategies to sustainably manage groundwater resources.
- Prioritizes basins with the greatest problems (ranked as high- and medium-priority).
- Sets a 20-year timeline for implementation.

The act includes provisions to promote the formation of a groundwater sustainability agency, which is made up of one or more local agencies overlying a groundwater basin, and development and implementation of a groundwater sustainability plan. Overdrafted basins must achieve groundwater sustainability by 2040 or 2042, predicated on the completion of plans. Under the act, DWR has the lead role in working with local agencies in implementing its provisions (Water Education Foundation, 2015).

4 ALTERNATIVES

4.1 PROCESS TO DEVELOP ALTERNATIVES TO ADDRESS SALT AND NITRATE CONCERNS

As described in Section 2.3, salt and nitrate problems in the Central Valley are complex and multi–faceted. Sources for both constituents are diverse and include ongoing activities as well as legacy deposits. Expansive areas of groundwater basins already contain concentrations in excess of levels known to impact beneficial uses. While some of the areas of elevated salinity represent natural background conditions, natural background concentrations of nitrate are considered to range from 0.1 to 2 mg/L nitrate as nitrogen (United States Geological Survey, 1999) and some groundwater sub-basins are documented to exceed 50 mg/L nitrate as nitrogen (Larry Walker Associates, 2013). Historical activities have resulted in elevated concentrations of both salt and nitrate in many groundwater basins. Studies documenting restoration alternatives indicate that current technologies are expensive and will take decades to implement.

Given these significant challenges, the State Water Resources Control Board (State Water Board) and Central Valley Water Board held a public forum in 2006 to discuss the salinity conditions and concerns and initiated a stakeholder lead process to develop recommendations for a salinity management plan for the Central Valley. As a result of the initial meeting, a broad group of agriculture, cities, industry, and regulatory agencies joined together to form the Central Valley Salinity Alternatives for Long-term Sustainability (CV–SALTS) initiative. As more information became available on elevated levels of nitrate in groundwater drinking water supplies, CV-SALTS also took on the challenge of developing recommendations for a Central Valley–wide nitrate management strategy to ensure safe drinking water supplies.

4.1.1 CV-SALTS Initiative

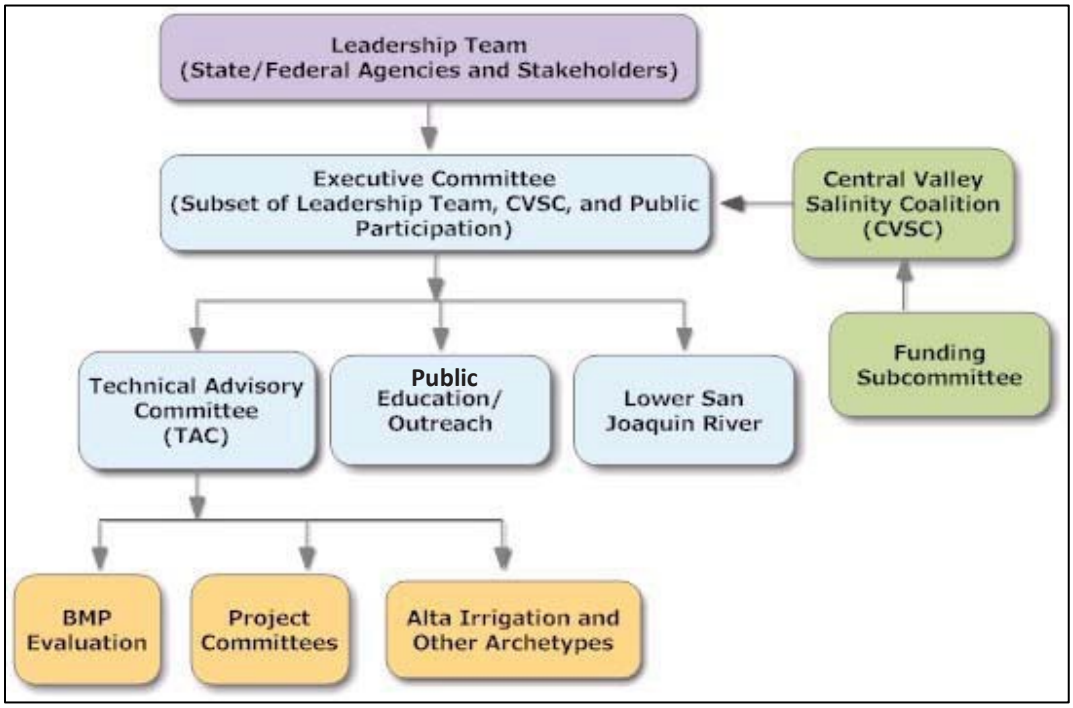
The CV-SALTS initiative developed a governance and management structure to ensure representation by a broad stakeholder base as well as to ensure that resulting recommendations were based on sound science and open policy discussions. The organizational structure for the effort is depicted in Figure 4–6 and includes an Executive Committee, non–profit Central Valley Salinity Coalition, Technical Committee, Public Education and Outreach Committee, and several sub-committees. The CV-SALTS Executive Committee is a decision-making body with 30 voting members that represent diverse stakeholder groups, including agriculture, cities, industry, regulatory agencies, and community and environmental justice representatives. The non–profit Central Valley Salinity Coalition was formed by dischargers to manage and fund the effort, and in 2010, the coalition entered into a Memorandum of Agreement with the State Water Board and the Central Valley Water Board to formalize their commitment. Goals adopted by CV-SALTS include:

- Sustain the Valley's lifestyle
- Support regional economic growth
- Retain a world–class agricultural economy
- Maintain a reliable, high–quality water supply
- Protect and enhance the environment

These goals were further articulated into three over–arching management priorities:

- Ensure safe drinking water supplies
- Achieve balanced salt and nitrate loadings
- Implement long-term, managed restoration where feasible, practicable and reasonable.

Figure 4 - 1. CV-SALTS Organizational Structure



CV-SALTS participants, including the Central Valley Water Board, worked together to develop a Central Valley–wide Salt and Nitrate Management Plan (SNMP) to address salinity and nitrate concerns in the Central Valley Region in a comprehensive, consistent, and sustainable manner. The CV-SALTS SNMP was submitted to the Central Valley Water Board in January 2017 and included recommended actions to identify drinking water users impacted by elevated nitrate and to provide short-term and long-term supplies of safe drinking water. Although broader in overall scope, the CV-SALTS SNMP was also developed to meet requirements set forth in the State Recycled Water Policy (Resolution 2009–0011) to ensure that every groundwater basin/sub-basin in California has an effective salt/nutrient management plan.

The CV-SALTS initiative used an open, public process to develop the SNMP with recommendations discussed during Executive Committee meetings that occurred approximately twice a month. In addition, annual status reports were provided to the State Water Board during public hearings and included information on progress, expenditures and contributions of stakeholders, as well as future milestones and the timeline to complete the project. Public workshops were also held at the Central Valley Water Board on an annual basis to allow open discussion of emerging recommendations. Each subcommittee was chaired by a stakeholder and meeting schedules were posted on the CV-SALTS initiative website (www.cvsalinity.org) and open to the public. In summary, over 140 Executive Committee meetings were held as well as over 50 Technical Committee meetings. In addition,

52 meetings were held specific to the Lower San Joaquin River Sub–Committee, and over 45 meetings related to other sub–committees not including ongoing work by the Public Education and Outreach Committee (PEOC). The PEOC is comprised of 26 stakeholder members, including representatives from industry, agriculture and other water interests, and has prepared several outreach documents including bilingual fact sheets and audience–specific brochures, has held approximately 50 targeted meetings in 2017 within the industrial, agricultural, education and research communities, and has future plans to target outreach to communities and hold webinars. Additional information on the public process utilized including stakeholder groups who have had representative attend one or more CV-SALTS meetings are included in Appendix L. The basis for the discussions, recommendations and outreach material are the technical studies and case studies described below.

These technical studies and case studies also provide the foundation for the alternatives developed and evaluated to address salt and nitrate issues in the Central Valley.

4.1.2 Technical Studies

A guiding principal for the CV-SALTS initiative was to base decisions on sound science. A series of technical studies were completed to provide information on salinity impacts on beneficial uses as well as potential management measures and implementation actions to address the overarching goals of providing safe drinking water, balancing salt and nitrate loading, and long-term, managed restoration of groundwater basins. These studies are summarized in Table 4–1. Final recommendations needed to be based on understanding salt and nitrate sources, available assimilative capacity in receiving water bodies, fate and transport, and current loading estimates/trends. Studies addressing these technical aspects are summarized in Table 4–2. All identified studies are available at https://www.cvsalinity.org/docs/committee–document/technical–advisory–docs/3886–attachment–b–documentation–122216–v2–1/file.html.

Table 4 - 1. Regulatory and Technical Studies to Support CV-SALTS SNMP Development and Implementation.

Study	Purpose	Key Reference[1]
Regulatory Studies to Support SNMP Development		
Salinity Effects on MUN– related Uses of Water	Define what constitutes reasonable protection of existing and probable future MUN uses by evaluating the state of knowledge regarding the effects of elevated salinity concentrations on drinking water supply, including human health concerns, and other domestic uses of water, e.g., impacts of salinity on residential, commercial and industrial water–using devices	CDM Smith. 2016d. *Salinity Effects on MUN–related Uses*.
Salinity Effects on Agricultural Irrigation Uses	Define what constitutes reasonable protection of existing and probable future use of water for agricultural irrigation by evaluating the state of knowledge regarding the effects of elevated salinity concentrations on crop yields, wetland plants and vegetation commonly used for landscaping	CDM Smith. 2016c. *Salinity Effects on Agricultural Irrigation–related Uses*.
Stock Watering Protection	Identify water quality criteria that may be used to establish salinity and nitrate–related water quality objectives to protect stock watering supplies	Kennedy/Jenks Consultants. 2013. *Salt and Nutrients: Literature Review for Stock Drinking Water Final Report*.
Aquatic Life Protection	Evaluate potential water quality criteria that could be used to establish salinity–related water quality objectives to protect aquatic life	Buchwalter 2014. *Aquatic Life Study Final Report*.
Technical Studies to Support SNMP Implementation		
Nitrate Implementation Measures Study (NIMS)	Identify implementation measures to reduce current ambient nitrate concentrations in groundwater to protect and restore beneficial uses, consistent with the SNMP's management goals	CDM Smith. 2016a. *Nitrogen Implementation Measures Study Final Report*.
Aggressive Restoration Modeling Scenario	Understand better the types of nitrate control measures that would be necessary to meet the SNMP management goal to implement a managed aquifer restoration program	Luhdorff & Scalmanini Consulting Engineers and Larry Walker Associates. 2016b. *Alta Irrigation District Management Zone: Aggressive Restoration Alternative Modeling Scenario Results*.
Technical Studies to Support SNMP Implementation (continued)		
Alta Irrigation District Management Zone Archetype	Facilitate the development of the CV-SALTS Groundwater Management Zone Policy by evaluating issues that might affect the development and implementation of a management zone.	Larry Walker Associates et al. 2016. *Management Zone Archetype Analysis Report: Alta Irrigation District*.
Strategic Salt Accumulation Land and Transportation Study (SSALTS)	Phased study to provide the technical basis for the establishment of a salt management program to achieve the Central Valley's SNMP management goal and support implementation of the recommended Salinity Management Strategy	CDM Smith. 2013. *SSALTS Final Phase 1 Report: Identification and Characterization of Existing Salt Accumulation Areas*. CDM Smith. 2014. *SSALTS Final Phase 2 Report: Development of Potential Salt Management Strategies.* CDM Smith. 2016b. *SSALTS Final Phase 3 Report: Evaluate Potential Salt Disposal Alternatives to Identify Acceptable Alternatives for Implementation*.

Notes: [1] All referenced documents are available at:
http://www.cvsalinity.org/index.php/committees/technical–advisory/technical–projects–index.html

Table 4 - 2. CV-SALTS Technical Studies Completed to Satisfy Specific Recycled Water Policy SNMP Requirements for Evaluation of Salt and Nitrate

Required Recycled Water Policy Component	Relevant CV-SALTS Studies[1]
Salt and nutrient (nitrate) source identification	• Larry Walker Associates et al. 2013. *Initial Conceptual Model Final Report: Task 7 and 8 – Salt and Nitrate Analysis for the Central Valley Floor and a Focused Analysis of Modesto and Kings Subregions*. December 2013. • Larry Walker Associates et al. 2016. *Management Zone Archetype Analysis Report: Alta Irrigation District*. July 2016. • CDM Smith. 2016a. *Nitrate Implementation Measures Study*. March 2016. • CDM Smith 2013 and 2014. *SSALTS Final Phase 1 Report: Identification and Characterization of Existing Salt Accumulation Areas; and Final Phase 2 Report: Development of Potential Salt Management Strategies*. December 2013 and October 2014, respectively.
Basin/subbasin assimilative capacity	• Larry Walker Associates et al. 2013. Initial Conceptual Model Final Report: Task 7 and 8 – *Salt and Nitrate Analysis for the Central Valley Floor and a Focused Analysis of Modesto and Kings Subregions*. December 2013. • Luhdorff & Scalmanini Consulting Engineers and Larry Walker Associates. 2016a. *Region 5: Updated Groundwater Quality Analysis and High Resolution Mapping for Central Valley Salt and Nitrate Management Plan*; July 2016.
Basin/subbasin loading estimates	• Larry Walker Associates et al. 2013. Initial Conceptual Model Final Report: Task 7 and 8 – *Salt and Nitrate Analysis for the Central Valley Floor and a Focused Analysis of Modesto and Kings Subregions*. December 2013.
Fate and transport of salts and nutrients (nitrate)	• Larry Walker Associates et al. 2013. Initial Conceptual Model Final Report: Task 7 and 8 – *Salt and Nitrate Analysis for the Central Valley Floor and a Focused Analysis of Modesto and Kings Subregions*. December 2013.

Recommendations in this staff report utilize findings in the reports identified in Tables 4–1 and 4–2, particularly the modeling of fate and transport of salt and nitrate within groundwater sub-basins, trends over time, and simulations of restoration of impacted groundwater aquifers under different management scenarios. The conclusions based on these studies were submitted for independent scientific peer review.

4.1.3 Case Studies

Some of the recommendations in this staff report consider appropriate designation of beneficial uses and level of protection, as well as alternative approaches to regulating salt during extended dry periods. As proofs of concept, three separate Basin Plan Amendments were recommended addressing specific issues as noted below. Each amendment was adopted by the Central Valley Water Board and is either fully in effect or moving through additional levels of approval at the State Water Board, Office of Administrative Law, and, as appropriate, USEPA.

- Resolution R5–2017–0032 Basin Plan Amendment to de-designate MUN and AGR from a horizontally and vertically delineated portion of the Tulare Lake Bed

groundwater basin. (In effect)
    - Identified requirements for de-designation of MUN/AGR
        - Electrical conductivity concentration greater than 5,000 µS/cm
        - No existing or potential MUN or AGR use
    - Identified effective outreach process to communities and domestic well users
    - *Serves as a template to delineate areas that may serve as salt management zones so that salt may be moved out of salt sensitive areas and consolidated.*

- Resolution R5–2017–0088 Basin Plan Amendment to incorporate a MUN evaluation process for agriculturally dominated water bodies (scheduled for State Water Board approval hearing in 2018)

    - Develops categorization process for identifying constructed facilities vs. natural water bodies that are dominated by agricultural activities
    - Uses the categories to determine appropriate designation of MUN use and level of protection
        - De-designation when meeting Sources of Drinking Water Policy (88–63) exceptions
        - Limited MUN use designation and related water quality objectives when not meeting exceptions
    - Allows interim permit limits until designations approved through Basin Plan Amendment
    - Requires monitoring to ensure relevant water quality objectives are met
    - *Allows reuse of limited water supplies without the constraints of requiring dischargers to meet drinking water maximum contaminant levels in constructed ag drains and other facilities with no existing or potential MUN use*

- Resolution R5–2017–0062. Basin Plan Amendment to establish salinity objectives in the Lower San Joaquin River upstream of Vernalis (approved by State Water Board January 2018 (Resolution No. 2018–0002); scheduled for submittal of OAL and USEPA Spring 2018).
    - Identified process for determining appropriate salinity water quality objectives to protect AGR on a sub–watershed scale
        - Recommended model inputs for determining most sensitive crop; leaching fraction, and estimated dry year limitations
        - Approach to gain input from area growers
    - Establishment of extended dry year salinity objectives protective of AGR and MUN
    - Process for NPDES dischargers to conduct reasonable potential evaluations for salinity and account for conservation practices
    - *Provides example of process to determine appropriate level of AGR protection as well as considerations for extended dry year and/or conservation policies.*

The process identified and information gathered noted above was used to develop the CV-SALTS SNMP (2016) submitted to the Central Valley Water Board in January 2017. In March 2017, the Central Valley Water Board directed staff to develop Basin Plan Amendments to incorporate a Salt and Nitrate Control Program following the overall goals and framework of the CV-SALTS SNMP and to utilize specific recommendations on needed clarifications, policies and new regulatory tools (or strategies), as appropriate (Resolution R5–2017–0031).

Staff has continued working through the CV-SALTS initiative to refine the original recommendations and develop the current recommendations outlined in this staff report.

4.1.4 Criteria to Select Preferred Alternative

Given the impacts of elevated salt and nitrate concentrations occurring and anticipated to occur in the Central Valley (as documented in Section 2.0), stakeholders engaged in the CV-SALTS initiative developed five over–arching goals:

- Sustain the Valley's lifestyle
- Support regional economic growth
- Retain a world–class agricultural economy
- Maintain a reliable, high–quality water supply
- Protect and enhance the environment

Further review highlighted the immediate public health concerns from elevated nitrate concentrations in drinking water supplies and the longer term impacts to crop productivity from salt. Therefore, the CV-SALTS initiative further developed three prioritized management goals:

- Ensure a safe drinking water supply
- Achieve balanced salt and nitrate loading
- Implement long-term, managed restorations where feasible, reasonable and practicable

Considering the diversity of the sources of salt and nitrate, the hydrogeologic diversity of the Central Valley itself and the extensive hydromodification within the Central Valley, stakeholders recognized that any proposed project would need the flexibility to work at both the broad valley–wide scale as well as at the local level. Available resources would need to be leveraged and actions would need to be phased to ensure that public health issues could be quickly addressed while longer term management solutions were put in place. To determine whether proposed alternatives met the over–arching and prioritized management goals listed above, the following criteria were developed to determine if the alternative would establish:

- Mechanisms to provide alternative water supplies
- Means to legally authorize discharges from modern farming practices
- Strategies to prevent further water quality degradation
- Implementable plans to restore degraded groundwater where it is reasonable, feasible and practicable to do so
- An approach that recognizes diversity of conditions across the Central Valley
- An approach that leveraged and maximized available resources

These criteria are utilized as part of the evaluation of the alternatives presented below.

4.2 Proposed Control Program and Associated Policies

Utilizing the CV-SALTS SNMP as a foundation, staff worked through the CV-SALTS process to finalize recommendations for a Central Valley Salt and Nitrate Control Program. Two primary alternatives emerged: 1) No Action Alternative; and 2) Incorporation of a Salt and Nitrate Control Program with supporting policies and new regulatory tools and authorities.

The No Action Alternative would continue regulation of salt and nitrate under the current Basin Plan framework and authority as outlined in Section 2.2 and Appendix C.

The Salt and Nitrate Control Program alternative is designed to address both legacy and ongoing salt and nitrate accumulation issues in surface and groundwater. The primary focus of early actions (first ten years) is on groundwater quality and in particular nitrate impacts to drinking water supplies. The prioritized management goals were further clarified as follows:

- ***Goal 1: Ensure a Safe Drinking Water Supply***. The most important management goal for the Central Valley Region is to ensure that a safe, reliable drinking water supply is available to all residents of the region. The need to ensure a safe, reliable drinking water supply is the highest priority for the management of nitrate under the Salt and Nitrate Control Program and is to be complied with as quickly as possible in all areas in the Central Valley Region.

- ***Goal 2: Achieve Balanced Salt and Nitrate Loadings***. This goal seeks to establish a balance of the mass of salt and nitrate in groundwater underlying each permitted or managed area, where reasonable and feasible. With regard to salt, balance is defined as achieving a state where inputs of salt (salt flux in) into a managed area are equal to outputs (salt flux out) from the same area. Similarly, nitrate balance means a balance of nitrate flux in and nitrate flux out of the permitted managed area. The nitrate mass balance will need to account for hydrologic conditions as well as nitrate taken up by crops and losses of nitrate from the nitrogen cycle in soil, including denitrification in the root zone by soil microbial activity and volatilization to the atmosphere. Current regulatory activities are moving toward this goal through source control activities. Under the Control Program these activities are expected to continue and expand.

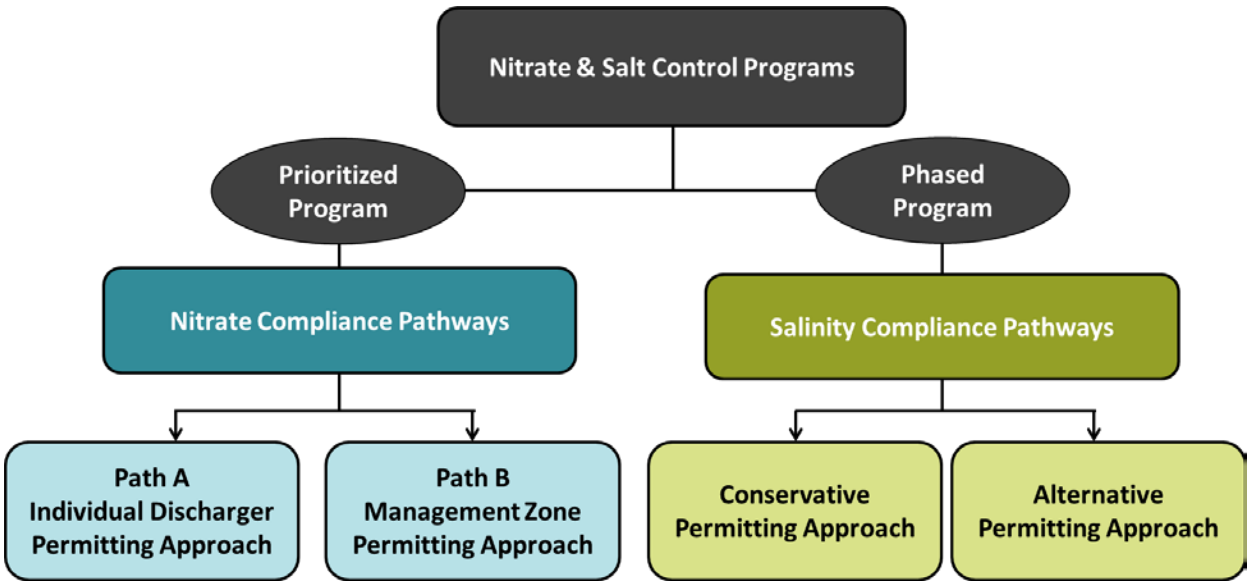
- ***Goal 3: Implement Managed Aquifer Restoration Program***. This goal seeks, where reasonable and feasible, to restore salt and nitrate levels within groundwater basins and subbasins or locally managed areas to concentrations that are below the applicable water quality objectives established for each constituent. Accordingly, Salt and Nitrate Control Program implementation not only focuses on restoring the beneficial use where reasonable and feasible, but it also seeks to minimize or prevent further degradation of groundwaters that are currently meeting water quality objectives so that they do not become impaired.

To meet these prioritized goals, the Salt and Nitrate Control Program has been phased with specific implementation activities required for salt and separate implementation activities required for nitrate. Both implementation approaches provide dischargers the option to select their means of compliance: either through a conservative permitting approach focused on individual source control, or through an alternative coordinated, multi–discharger management approach (Figure 4–2). When permittees elect alternative compliance, they are agreeing to participate collaboratively in valley-wide solutions, including under the proposed Nitrate Control Program, to provide replacement water and restoration (wherever reasonable, feasible and practicable) as part of permit provisions.

The proposed Control Program does not remove any of the current authority available to the Central Valley Water Board. Instead, it provides additional authority to allow the Board to consider innovative salt or nitrate management strategies where warranted, including strategies that are consistent with the intent and purpose of the Recycled Water Policy and the over–arching goals of the program.

The Salt and Nitrate Control Program is proposed to be implemented through a combination of Central Valley Water Board authorities. First, to ensure timely response and implementation of critical components to provide short-term safe water supplies, a Conditional Discharge Prohibition is proposed that will require that permittees to begin to implement provisions of the Control Program upon receiving a Notice to Comply issued by the Board's Executive Officer. The Conditional Discharge Prohibition will establish enforceable conditions until the Board revises permits to incorporate applicable requirements from the Control Program or determines that existing permit requirements are adequate. Second, for permittees subject to certain General Orders, the Board will hold a hearing to consider amending such Orders within 18 months of the effective date of the Salt and Nitrate Control Program to incorporate timelines and milestones for compliance. Long-term implementation of the Salt and Nitrate Control Program is achieved primarily through the Board's permitting actions (i.e., waste discharge requirements or conditional waivers); however, to be successful, coordination, funding and support will be required from multiple state, federal and local agencies as well as from local stakeholders and those benefitting from Central Valley waters.

Figure 4 - 2. Salt and Nitrate Management Strategy



The following identifies the major components of the Salt and Nitrate Control Program and policies that support its implementation:

- Salt Control Program (Discharges to Surface and Groundwater)
  - Phased Approach
- Nitrate Control Program (Discharges to Groundwater)
  - Prioritized Approach
  - Alternative Regulation Under a Management Zone
  - Alternative Compliance Projects
- Conditional Prohibition of Discharge (until Permits are updated to include control program provisions)

- Surveillance and Monitoring
- Policies to Support Implementation
    - Updated Variance Policy
    - Updated Exceptions Policy
    - Drought and Conservation Policy
    - Offsets Policy
- Application of Secondary Maximum Contaminate Levels (SMCLs) to Protect MUN
    - Revisions to SMCL Water Quality Objectives Section of Chapter 3
    - Clarification of Implementing SMCLs to Protect MUN in Chapter 4
- Definitions Specific to the Salt and Nitrate Control Program

Although the Salt and Nitrate Control Program alternative is to be considered as a whole, the components have been evaluated separately against the criteria and the no action alternative. Each component was discussed during the CV-SALTS public process with discussed alternatives for each element of each component summarized in Tables in Appendix D. Where consensus was achieved, only consensus recommendations are presented below. Where a primary recommendation was made but consensus not reached—notably for elements in the Nitrate Control Program, Offsets Policy, Drought and Conservation Policy, and proposed recommendations related to SMCLs, additional options are identified, discussed and evaluated.

4.2.1 Salt Control Program

When considering alternatives for salt control, stakeholders recognized five fundamental facts:

- Salt moves with water and consumptive use of that water increases the salt concentrations.
- No proven means exist at the present that will allow ongoing human activity in the Central Valley Region and maintain salinity levels throughout every groundwater basin.[31]
- Water conservation and increased recycled water is desired to maximize limited supplies but also results in increased salinity concentrations.
- Large portions of groundwater basins already contain concentrations of salinity that exceed narrative and numeric water quality objectives to protect AGR and MUN, respectively.
- Climate change will likely exacerbate existing issues by reducing available freshwater flows and increasing demands on more limited resources.

4.2.1.1 Alternatives

Two major alternatives were considered: 1) No Action Alternative; and 2) Incorporate a Salt Control Program.

4.2.1.1.1 No Action Alternative

The no action alternative is to continue regulation of salt discharges under the current regulatory framework discussed in Section 2.2 and Appendix C. The framework focuses on source control and implementation of state and federal antidegradation requirements to protect beneficial uses. Current regulatory authority is focused permit-by-permit and requires discharges to meet applicable water quality objectives if the receiving water already exceeds those objectives and

[31] TLB Basin Plan, Pg. III–8

provides for a limited time period for the permittees to come into compliance. The Tulare Lake Basin Plan identifies salt accumulation as the paramount water quality problem in the Basin and recognized that salinity levels in groundwater basins could not be maintained and still allow ongoing human activity. Therefore the Tulare Lake Basin Plan incorporated a framework that includes managed degradation from salt. The Sacramento–San Joaquin Basin Plan does not include a framework to control degradation or address conservation, recycling or restoration. Both Basin Plans recognize that ". . . a valley-wide drain to carry salts out of the valley remains the best technical solution . . ." for current salt accumulation. An economic study completed in 2009 (Howitt et al. 2009) indicated that if management of salt did not change, by 2030 annual economic cost would exceed $1.5 billion within the Central Valley.

4.2.1.1.2 Salt Control Program Alternative

Under the Salt Control Program alternative, there were specific elements recommended in the CV-SALTS SNMP and options to those elements identified through further stakeholder meetings and Board workshops. A list of Salt Control Program elements and options identified are provided in Table D–1 in Appendix D. Where agreement on approach was not reached, options are identified below by element.

4.2.1.1.2.1 Overview

The Salt Control Program utilizes a long-term Salinity Management Strategy that includes the following goals:

- Control the rate of degradation through a "managed degradation" program;
- Protect beneficial uses by applying appropriate antidegradation requirements for high quality water
    - Implement salinity management activities to achieve long-term sustainability and prevent continued impacts to salt sensitive areas; and
    - Where reasonable, feasible and practicable, protect beneficial uses by maintaining water quality that meets applicable water quality objectives and pursuing long-term managed restoration

Local salt management options in areas with significant salt concerns were evaluated (SSALTS 2016). These evaluations demonstrated that the volume and mass of unmanaged salt would remain high even under scenarios where existing salt management tools are widely adopted. A comprehensive solution to the salinity issues in the Central Valley will therefore need to rely on both local and sub–regional solutions as well as broad region-wide projects that will export salt out of the Central Valley. Additional studies are still needed to further define the range of solutions for surface and ground waters that may be deployed within each Central Valley hydrologic region to prevent continued impacts to salt sensitive areas in the Central Valley Region.

Given the need for these studies, a phased Salt Control Program consistent with the goals of the salinity management strategy is proposed. All permitted discharges of salt in the Central Valley are to comply with the provisions of this program. Two pathways to compliance are available during Phase I. Compliance pathways for subsequent phases will be identified prior to that phase. The Phase I Compliance pathways are:

1. ***Conservative Salinity Permitting Approach***, utilizes the existing regulatory structure that focuses on source control, use of conservative salinity permit limits, and limited use of assimilative capacity and/or compliance time schedules.

2. ***Alternative Salinity Permitting Approach***, is an alternative approach to compliance through implementation of specific requirements, rather than application of conservative effluent limits. Under Phase I, permittees must maintain current salinity control efforts and support facilitation and completion of the Salinity Prioritization and Optimization Study. Discharges to waste management units subject to the containment requirements of Division 2 of Title 27 of the California Code of Regulations are not eligible to be permitted under the Alternative Salinity Permitting Approach.

The primary goal of the Conservative Approach is to prevent degradation while the primary goal of the Alternative Approach is to manage degradation while long-term solutions are developed.

4.2.1.1.2.2 Phased Control Program

The Salt Control Program will be implemented in three phases, with each of the three phases having a duration of ten to fifteen years (Figure 4–3). Some portions of a subsequent phase may occur or be initiated prior to the end of an existing phase. At the discretion of the Central Valley Water Board Executive Officer, the completion date for any phase may be modified or extended up to five years based on the need to develop Basin Plan amendments to support implementation of the next phase, reduction in anticipated staff resources, need to extend milestones or other factors. The findings from each phase will inform the next phase, allowing for implementation of an adaptive management approach to salt management in the Central Valley Region.

The phases of the Salt Control Program are linked to activities that occur under the Alternative Salinity Permitting Approach, as follows:

Phase I – Prioritization and Optimization Study (P&O Study) – The P&O Study will facilitate the development of a long-term Salinity Management Strategy to achieve the goals of the Salt Control Program by coordinating and completing tasks and securing funding. The P&O Study will at a minimum:

- Develop groundwater and surface water–related salinity data and information for sensitive and non–sensitive areas for hydrologic regions within the entire Central Valley Region, including guidelines to protect salt–sensitive crops;
- Identify sources of salinity and actions that impact salinity in surface and ground waters;
- Evaluate impacts of state and federal policies and programs;
- Identify and prioritize preferred physical projects for long-term salt management (e.g. regulated brine line(s), salt sinks, regional/sub–regional de–salters, recharge areas, deep well injection, etc.);
- Develop the conceptual design of preferred physical projects and assess the environmental permitting requirements and costs associated with each of these projects;
- Identify non–physical projects and plan for implementation;
- Develop a governance structure and funding plan;
- Identify funding programs, including federal and state funds, and opportunities for future phase implementation; and
- Identify recommendations for Phase II of the Salt Control Program.

The P&O Study will inform Phases II and III of the Salt Control Program. Based on the findings of the P&O Study, the Central Valley Water Board, through a public process, will review the Basin Plan and consider whether modifications to the Basin Plan are required to facilitate implementation of Phases II or III.

Phase II – Project Development and Acquisition of Funds – Phase II of this Salt Control Program will begin no later than at the end of Phase I, but some activities may be initiated during Phase I. Phase II includes the following key elements:

- Using available funding sources, complete the engineering design and environmental permitting of preferred physical projects identified in Phase I;
- Initiating or continuing implementation of preferred non–physical projects identified during Phase I and, if appropriate, identifying new preferred non–physical projects and the process or milestones for implementation; and
- Identifying sources and securing the funding to implement the preferred physical projects.

Phase III – Project Implementation – During Phase III, construction of preferred physical projects will be completed, unless already completed during Phase II. Preferred project alternatives are anticipated to include salt management areas, de–salters and a regulated brine line. The focus of this phase is the physical movement of salt away from salt sensitive areas and into management areas as well as laying the foundation for long-term managed restoration efforts. For large–scale capital projects, such as construction of a regulated brine line, construction may occur over multiple phases and additional time may be required to complete full build–out of the project.

Funding and Overseeing the Prioritization and Optimization Study and Future Phases – Conducting the Prioritization and Optimization Study is anticipated to cost up to $10 million, and is expected to take 10 years to complete. In addition to natural processes and consumptive use, Central Valley salinity issues are a result of valley–wide modified hydrology and water/salt transport. In light of the cost and time associated with this comprehensive, valley–wide effort, the program is structured to encourage all (or almost all) dischargers of salt help fund its implementation. Entities beyond permittees that also benefit from salinity management in the Central Valley, such as those that import water from the Central Valley, are encouraged to participate in the Priority and Optimization Study as well as implementation of Phases II and III as applicable. For those participating in the P&O Study, their level of participation will be determined by a lead entity based, in part, on ambient conditions, proportional contribution of salts and other factors as determined appropriate.

The likely entity that would take the lead in moving forward with the P&O Study, including determining the appropriate level of financial participation for dischargers and others, is the existing Central Valley Salinity Coalition (CVSC). However, the CVSC may need to adjust its membership and policy structures with respect to conducting the P&O Study to ensure that the CVSC is properly organized for addressing Central Valley salinity issues and to ensure that membership and governance structure account for all those potentially impacted by its decisions. It is also anticipated that CVSC activities related to implementation of the P&O Study will be discussed in an open stakeholder process through an entity similar to the CV-SALTS Executive Committee. As the P&O Study moves forward, progress reports will be required by the Central Valley Water Board after critical milestones.

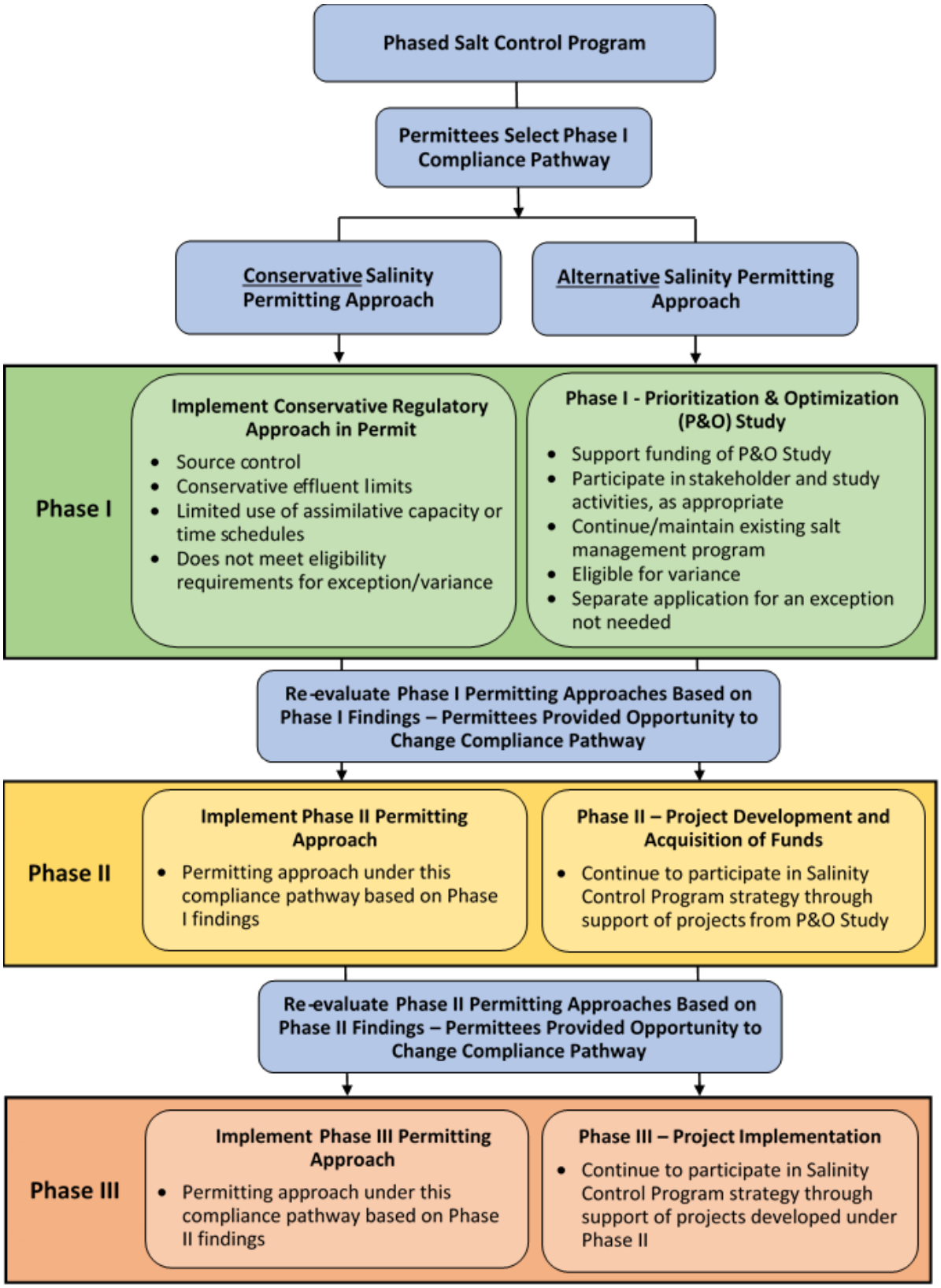
4.2.1.1.2.3 Salt Control Program Implementation

Table 4–3 depicts the key components of the two pathways to regulatory compliance under the Phase I Salt Control Program. The Conservative Pathway focuses on source control to ensure that beneficial uses are protected and restricts degradation without a finding that the discharge provides a greater benefit to the people of the state than participation in the Alternative Pathway. The Alternative Pathway approach allows the Central Valley Water Board to manage degradation while the long-term salinity efforts are being implemented. The Central Valley Water Board retains its discretion to adjust the established requirements on a case–by–case basis. However, application of such discretion is limited under the Conservative Salinity Permitting Approach in order to encourage permittees to participate in a valley–wide management solution.

Table 4 - 3. Comparison Between the Conservative and Alternative Salinity Permitting Approaches During Phase I

Conservative Salinity Permitting Approach	Alternative Salinity Permitting Approach
<u>All Permittees</u> • Apply conservative assumptions for interpretation of the narrative objectives and application of numeric water quality objectives to protect AGR and MUN beneficial uses • Limited availability of a compliance or time schedule to meet a salinity–related effluent limit or waste discharge requirement (subject to the discretion of the Central Valley Water Board) <u>Groundwater Discharge and Non-NPDES Discharge Permittees</u> • Limited new or expanded allocation of assimilative capacity subject to the discretion of the Central Valley Water Board • Does not meet eligibility requirements for an exception <u>NPDES Surface Water Discharge Permittees</u> • A new or expanded allocation of assimilative capacity may be authorized only where a permittee can demonstrate that the impact of the new discharge or the increased discharge will be spatially localized or temporally limited, a determination subject to the discretion of the Central Valley Water Board • Does not meet eligibility requirements for a variance	<u>All Permittees</u> • Participate in the Phase I Prioritization and Optimization Study throughout its duration • Continue implementing reasonable, feasible and practicable efforts to control salinity through performance–based measures as determined by the Central Valley Water Board, including: - Salinity management practices - Pollution prevention, watershed, and/or salt reduction plans - Monitoring - Maintenance of existing discharge concentration or loading levels of salinity <u>Groundwater and Non-NPDES Discharges</u> • Salinity limits not used as a compliance metric except to ensure implementation of performance–based measures; • Permittees that meet requirements of the alternative salinity permitting approach are considered in compliance with their salinity limits <u>NPDES Surface Water Discharges</u> • Eligible for a salinity variance

Figure 4 - 3. Salt Control Program Pathways to Compliance



Under Phase I of the Salt Control Program, permitted dischargers of salt (permittees) will be subject to the Conservative Salinity Permitting Approach unless the permittee elects to be permitted under the Alternative Salinity Permitting Approach.

A permittee may switch from one approach to another by submitting a written request to the Executive Officer of the Central Valley Water Board to change its selected compliance pathway. This request must include documentation regarding how the permittee will comply with the requirements applicable to the compliance pathway it is now requesting to be permitted under and the basis for the change. If the permittee requests to change from the Alternative to the Conservative Permitting Approach, the permittee must demonstrate to the Central Valley Water Board that it has complied with all provisions associated with the Alternative Compliance Permitting Approach, including financial support to the P&O Study, up through the time of permit revision to incorporate requirements for the Conservative Permitting Approach. If the permittee requests to change from the Conservative Permitting Approach to the Alternative Approach, the permittee shall meet the financial commitment requirements of the Alternative Approach as required by the entity conducting the P&O Study.

Prior to implementation of Phase II, the Central Valley Water Board, through a public process, must review the Salt Control Program and reconsider compliance pathways for Phase II. The compliance pathways for Phase II may be similar or different from those in Phase I. Permittees will have an opportunity to review and select Phase II compliance pathways upon implementation of Phase II. The process shall repeat itself prior to implementation of Phase III.

Compliance Pathway Requirements

Table 4–3 proves a general overview of the differences between the Conservative and Alternative Permitting Approaches. The following sections provide additional information regarding the requirements to comply with the Salt Control Program under each. The Conservative Approach will apply to all permitted dischargers of salt, unless the permittee elects to participate in the Phase I Alternative Approach.

Phase I Conservative Approach

The Conservative Approach was developed to ensure no further degradation to high quality waters. The approach generally utilizes conservative assumptions to interpret narrative objectives to protect AGR and numeric water quality objectives to protect MUN, while also requiring that the most salt sensitive beneficial use be protected. In addition, the approach limits the availability of a compliance or time schedule to meet a salinity–related effluent limit or waste discharge requirements as well as limiting the use of assimilative capacity unless a finding that the discharge provides a greater benefit to the people of the state than participation in the Alternative Pathway can be made by the Central Valley Water Board. Permittees choosing compliance under the Conservative Approach are not eligible for a variance or exception to meeting water quality objectives since the approach focuses on reducing or eliminating further degradation to high quality waters.

Under the Conservative Salinity Permitting Approach, permit conditions would be based on the following requirements.

Groundwater and Non-NPDES Surface Water Discharges

The Central Valley Water Board shall apply the following principles to permits being issued to regulate discharges of salinity to groundwater or discharges of salinity to surface waters that are not subject to NPDES permits (Chapter 5.5 of the Porter–Cologne Water Quality Control Act which contains state statutory requirements for issuing NPDES permits consistent with the federal Clean Water Act).

1. *Permit Provisions* – Surface and Groundwater Permit limitations shall be set as follows:

    (a) Limitations shall be set based on the applicable water quality objective that protects the most sensitive beneficial use and considering degradation of a high quality water. The Central Valley Water Board may use its discretion to continue to authorize a previously approved mixing zone for salinity subject to the provisions in paragraph (4).

2. *Application of Applicable Water Quality Objectives* – When the most salinity sensitive beneficial use is AGR or MUN, the Central Valley Water Board will apply the associated narrative and range in numeric objectives as indicated below. When the applicable water quality objective for setting Permit Limitations is a site–specific numeric water quality objective, the Board shall apply that numeric objective. The values recommended below apply only for the conservative approach during Phase I.

    (a) AGR Beneficial Use Protection – When it applies the narrative water quality objective, the Central Valley Water Board shall use a conservative, numeric value for electrical conductivity (EC) to protect the AGR beneficial use. During Phase I of the Salt Control Program, the numeric value of 700 µS/cm EC (as a monthly average) shall be considered to be a conservative value that is protective of the AGR beneficial use. This value is for use only as indicated here for the Conservative Permitting Approach and shall not be considered a water quality objective. For discharges where a site–specific numeric value has been developed and/or previously applied to the discharge for the protection of the AGR beneficial use, the Board shall continue to apply that value, as appropriate.

    (b) MUN Beneficial Use – When it applies a Secondary Maximum Contaminant Level (SMCL) for protection of a MUN beneficial use, the Central Valley Water Board shall use the recommended SMCL of 900 µS/cm EC (as an annual average).

<u>Other Options Considered on Measuring Compliance</u>:

a) Proposed alternative utilizes current regulatory framework for classes of dischargers to surface or groundwater which may vary from measuring compliance in the effluent, receiving water or both.

b) Measure compliance in the effluent in order to provide a conservative estimate and avoid time–consuming and costly studies to model impacts on receiving water

c) For measuring compliance in discharges to groundwater

a. Utilize "Shallow" zone as defined in the Nitrate Control Program for consistency (links to domestic well depth)

b. Redefine "Shallow" zone to represent shallowest 10% of saturated zone rather than link to domestic wells

c. Develop a default calculation (e.g. 20–ft. screening length with five feet

above the saturated zone) with option to justify alternative

3. *Consideration of Degradation to High Quality Waters* – Before authorizing degradation to high quality waters, and consistent with the state and federal antidegradation policies as applicable, the Central Valley Water Board must consider, among other things, if allowing the degradation is to the maximum benefit to the people of the state. Under the Phase I Conservative Permitting Approach, the Central Valley Water Board must specifically find that allowing this permittee to degrade a high quality water better serves the people of the state rather than their participation in the P&O study for Phase I of the Salt Control Program.
4. *Allocation of Assimilative Capacity* – For both surface and groundwater discharges, the Central Valley Water Board will limit new or expanded allocations of assimilative capacity. If a permittee has previously received an allocation of salinity related assimilative capacity, and the allocation was granted with the support of an antidegradation study or analysis, then the Central Valley Water Board may consider continuing the previously approved allocation of assimilative capacity.
5. *Salinity Exception* – Permittees operating under the Phase I Conservative Salinity Permitting Approach do not meet eligibility requirements for a salinity exception.
6. *Issuance of Time Schedules* – The Central Valley Water Board will limit use of time schedules for achieving compliance with salinity permit limitations and will use its discretion to limit the time allowed in the event that a time schedule is deemed necessary under the particular circumstances associated with that discharge.

NPDES Surface Water Discharges

The following principles will be applied to permits being issued to regulate discharges of salinity to surface waters that are subject to NPDES permit provisions as required by the federal Clean Water Act.

1. *Permit Provisions* – Permit limitations shall be set as follows:
    - Limitations shall be set based on the applicable water quality objective that protects the most sensitive beneficial use and based on the application of the Antidegradation Policy. The Central Valley Water Board may use its discretion to continue to authorize a previously–approved mixing zone for salinity subject to the provisions in paragraph (4).
2. *Application of Applicable Water Quality Objectives* – When the most salt sensitive beneficial use is AGR or MUN, the Central Valley Water Board will apply the associated narrative and range in numeric objectives as indicated below. When the applicable water quality objective for setting Permit Limitations is a site–specific numeric water quality objective, the Board shall apply that numeric objective. The values recommended below apply only for the conservative approach during Phase I.
    a. AGR Beneficial Use Protection – When it applies the narrative water quality objective, the Central Valley Water Board shall use a conservative, numeric value for electrical conductivity (EC) to protect the AGR beneficial use. During Phase I of the Salt Control Program, the numeric value of 700 µS/cm EC (as a monthly average) shall be considered to be a conservative value that is protective of the AGR beneficial use. This value is for use only as indicated here for the Conservative Permitting Approach and shall not be considered a water

quality objective. For discharges where a site–specific numeric value has been developed and/or previously applied to the discharge for the protection of the AGR beneficial use, the Board shall continue to apply that value, as appropriate.

b. MUN Beneficial Use – When it applies a Secondary Maximum Contaminant Level (SMCL) for protection of a MUN beneficial use, the Central Valley Water Board shall use the recommended SMCL of 900 µS/cm EC (as an annual average).

Options on Measuring Compliance:

a) Proposed alternative utilizes current regulatory framework for classes of dischargers to surface water which may vary from measuring compliance in the effluent, receiving water or both.

b) Measure compliance in the effluent in order to provide a conservative estimate and avoid time consuming and costly studies to model impacts on receiving water

3. *Consideration of Degradation to High Quality Waters* – Before authorizing degradation to high quality waters, and consistent with the state and federal antidegradation policies as applicable, the Central Valley Water Board must consider, among other things, if allowing the degradation is to the maximum benefit to the people of the state. Under the Phase I Conservative Permitting Approach, the Board must specifically find that allowing this permittee to degrade a high quality water better serves the people of the state rather than their participation in the P&O study for Phase I of the Salt Control Program.
4. *Allocation of Assimilative Capacity (i.e., mixing zone/dilution credit)* – The Central Valley Water Board will limit new or expanded allocations of assimilative capacity in surface water (i.e., mixing zone/dilution credit) and will consider whether a permittee can demonstrate that the reduction of water quality will be spatially localized or temporally limited with respect to the waterbody. The Board may consider maintaining any previously approved allocations of assimilative capacity, if the previously approved allocation was granted with the support of an antidegradation study or analysis.
5. *Salinity Variance* – Permittees operating under the Phase I Conservative Salinity Permitting Approach do not meet eligibility requirements for a salinity variance.
6. *Compliance Schedule* – Where a reasonable potential finding has been made and the permittee is unable to comply with the applicable salinity effluent limit, the Central Valley Water Board will use its discretion to limit the use of compliance schedules authorized by the State Water Board Compliance Schedule Policy for achieving compliance with salinity–based effluent limits, and will use its discretion to limit the time allowed in the event that a compliance schedule is deemed necessary under the particular circumstances associated with the discharge.

Phase I Alternative Salinity Permitting Approach

In lieu of being subject to the Conservative Permitting Approach, permittees may elect to be permitted for discharges of salinity by participating in the Phase I Alternative Salinity Permitting Approach. Permittees electing to participate in the Phase I Alternative Salinity Permitting Approach are given the opportunity to participate collectively in the P&O Study with other permittees, the Central Valley Water Board, and other stakeholders, including those importing and benefitting from water supplies from the Central Valley, to work toward full implementation of the Salt Control Program. Key milestones for the P&O Study are identified in Table 4–4 and outlined in Figure 4–4. To manage degradation while studies are in progress, permittees must

continue to meet performance based standards with any increase in salt load limited under the discretion of the Board. Permittees under the Alternative Approach are eligible for conditional variances or exceptions from salinity water quality objectives if needed, with confirmed participation in the P&O Study satisfying conditional variance or exception requirements.

If the P&O Study does not meet the milestones established in Table 4–4 or where the Central Valley Water Board finds reasonable progress is not being made towards achieving the milestones, the Board will notify the permittees that selected the Alternative Salinity Permitting Approach of its findings through public notice that includes a required schedule for completion of the P&O Study milestones. Failure to comply with the requirements in the notice will result in all permittees that elected to be permitted under the Phase I Alternative Salinity Permitting Approach to be subject to the requirements of the Conservative Salinity Permitting Approach.

Salinity–related permit conditions will be based on the requirements established below. Permitted salinity discharges shall be implemented in a manner consistent with State Water Board Resolution 68-16, the Statement of Policy with Respect to Maintaining High Quality of Waters in California (State Antidegradation Policy) and the federal antidegradation policy (40 CFR §131.12), as applicable. Discharges to waste management units subject to the containment requirements of Division 2 of Title 27 of the California Code of Regulations are not eligible to be permitted under the Alternative Salinity Permitting Approach.

Groundwater and Non-NPDES Surface Water Discharges

The following principles will be applied to permits being issued for regulating discharges of salinity to groundwater or discharges of salinity to surface waters that are not subject to NPDES permits (Chapter 5.5 of the Porter–Cologne Water Quality Control Act which contains state statutory requirements for issuing NPDES permits consistent with the federal Clean Water Act).

1. *Participation in P&O Study* – Permittees electing the Alternative Salinity Permitting Approach shall be required to participate in efforts related to conducting the P&O Study, including providing the minimum required level of financial support. The level of participation may vary based on salinity in the discharge, local conditions or other factors. The needed level of participation would be established by the lead entity (i.e., Central Valley Salinity Coalition [CVSC]) that is overseeing the P&O Study. The lead entity shall document and confirm full participation by the permittee(s) until the P&O Study is completed or until such time that the Central Valley Water Board otherwise revises the applicable waste discharge requirements and/or conditional waiver or determines permittee is in compliance with the requirements of the Phase 1 Conservative Salinity Permitting Approach. The timeframe for completion of the P&O Study is expected to be ten years from the effective date of this Salt Control Program but may be extended by the Board's Executive Officer for a period of up to five years.

2. *Implementation of Reasonable, Feasible and Practicable Efforts to Control Salinity* – The Central Valley Water Board will require dischargers to continue to implement reasonable, feasible and practicable efforts to control levels of salinity in discharges. Such efforts may include, but are not limited to, implementation of management practices that are designed to reduce salinity in discharges; implementation of pollution prevention plans, watershed plans, and/or salt reduction plans that help to reduce salt loads in discharges to groundwater or surface water; and, monitoring for salinity in surface water or groundwater as part of existing local, watershed–based or regional monitoring programs, in coordination with monitoring under the Salt and Nitrate Control Program.

3. *Maintain Current Discharge Concentrations for Salinity or Mass Loading Levels* – To the extent reasonable, feasible and practicable (and while accounting for conservation and drought, salinity levels in the water supply source, and some appropriate increment of growth), the Central Valley Water Board may use its discretion to adopt performance–based limits or action levels to the extent the Board finds it appropriate and necessary for salinity for permittees electing the Alternative Salinity Permitting Approach.

4. *Setting Permit Requirements* – In regulating discharges of salinity in waste discharge requirements and conditional waivers, the Board shall require dischargers to fully participate in the P&O study (as documented by the lead entity overseeing the study), implement reasonable, feasible and practicable efforts to control salinity, and meet any performance–based limits or action levels deemed appropriate and necessary by the Central Valley Water Board. Compliance with these requirements shall constitute compliance with the water quality control plan and shall be deemed adequately protective of beneficial uses and the water quality objectives reasonably required for that purpose consistent with this Salt control program.

NPDES Surface Water Discharges

The Central Valley Water Board shall apply the following principles to permits being issued for authorizing discharges of salinity to surface waters subject to NPDES permits under the federal Clean Water Act.

1. *Participation in P&O Study* – Permittees electing the Alternative Salinity Permitting Approach shall be required to fully participate in efforts related to conducting the P&O Study including providing at least the minimum required level of financial support as determined by the lead entity. The level of participation may vary based on salinity in the discharge, local conditions or other factors. The needed level of participation would be established by the lead entity (i.e., CVSC) that is overseeing the P&O Study. The lead entity shall document and confirm adequate participation by the permittee(s) until the P&O Study is completed or until such time that the Central Valley Water Board otherwise revises the applicable NPDES permit consistent with this Control Program. The timeframe for completion of the P&O Study is expected to be ten years from the effective date of this Salt Control Program but may be extended by the Board's Executive Officer for a period of up to five years.
2. *Requirements for Ensuring Reasonable Protection of Beneficial Uses* – Full participation in the P&O study as documented and confirmed by the lead entity overseeing the P&O Study shall be found by the Central Valley Water Board to provide for in lieu or alternative compliance to receiving water limits or effluent limits based on salinity. To determine reasonable potential, the Board maintains its discretion to conduct such analysis by using the approach set forth in U.S. EPA's Technical Support Document, by using the approach set forth in the State Implementation Plan, or by using another approach that is consistent with applicable federal regulations. To the extent that the discharge in question is found to have reasonable potential for causing or contributing to a violation of an applicable salinity water quality objective pursuant to applicable federal regulations, the Board may consider granting use of assimilative capacity by allowing for a mixing zone and dilution credits. Adequate participation in and progress of the P&O Study satisfies requirements for a conditional variance to salinity limits where needed.

Table 4 - 4. Key Phase I Prioritization and Optimization Study Milestones

Implementation Schedule	Milestone/ Deliverable	Minimum Requirements
6 months from Notice to Comply	Phase I Workplan	*Workplan to include*: • Detailed P&O Study task descriptions • Cost estimate for each task • Task completion schedule • Stakeholder participation elements
Within 12 months from Notice to Comply	Phase I Funding & Governance Plan	*Complete Phase I implementation planning:* • Establish the entity and procedures for governance of the P&O Study • Develop funding plan to complete the P&O Study
Per Workplan	Special Studies	*Special Studies to include*: • Groundwater Quality Trace Constituent Study • Recycled Water Imports Study • Stormwater Recharge Master Plan Study • Emerging Technology Updates (every 5 years)
12 months from Workplan approval and annually there after	Annual Progress Report	*Annual Report to summarize*: • Progress on Workplan execution • Status of Phase I funding and expenditures • Stakeholder participation
5 years from Notice to Comply	Interim Project Report	*By Central Valley Hydrologic Region, identify*: • Recommended preferred physical projects with recommended next steps for development • Recommended non–physical projects and a schedule for implementation
9 years from Notice to Comply	Long-term Governance Plan for Phases II and III	*Governance Plan that establishes*: • Describes planned implementation approach for Phases II & III • Governance structure including: - Stakeholder roles and responsibilities - Committees responsible for development of policies, technical documents, BMPs and funding
	Long-term Funding Plan for Phases II and III	*Funding Plan that establishes*: • Financial approach for long-term funding including sources and funding types (grants, bonds, loans, etc.) • Approach for the equitable management and funding of long-term, large–scale salinity management projects
	Basin Plan Amendment Recommendations	*As needed, recommended amendments to Basin Plans to:* • Facilitate implementation of Phase II of the Salt Control Program • Consider revisions of salinity variance and salinity exception policies • As appropriate, modify the Conservative or Alternative Salinity Permitting Approaches;
10 years from Notice to Comply	Final Phase I Project Report	• *For preferred physical projects*: - Conceptual designs - Assessment of environmental permitting requirements • Status of implementation of non–physical projects per Interim Project Report with recommendations for modifications, as needed

3. *Implementation of Reasonable, Feasible, and Practicable Efforts to Control Salinity* – The Central Valley Water Board will continue to require implementation of reasonable, feasible and practicable efforts to control levels of salinity in discharges. Such efforts may include, but are not limited to, implementation of management practices that are designed to reduce salinity in discharges; implementation of pollution prevention plans, watershed plans, and/or salt reduction plans that help to reduce salt loads in discharges to surface waters; and, continued monitoring for salinity in surface water as part of existing local, watershed–based or regional monitoring programs, in coordination with monitoring under the Salt and Nitrate Control Program.
4. *Maintain Current Discharge Concentrations for Salinity or Mass Loading Levels* – To the extent reasonable, feasible and practicable (and while accounting for conservation, salinity levels in the water supply source, and some appropriate increment of growth), the Central Valley Water Board may use its discretion to prescribe performance–based limits or triggers to the extent the Board finds such additional actions appropriate and necessary for salinity for permittees electing the Alternative Salinity Permitting Approach.

Permitted Discharge to a Water Body Where a Beneficial Use Has Been De-designated

The P&O Study will establish a program for the long-term management of salts in the Central Valley, including identifying locations that may serve as salt management areas. For example, a groundwater basin that has had one or more beneficial uses de-designated due to salinity may be a considered a potential location for establishment of a salt management area. Accordingly, under the Phase I Salt Control Program:

- Permittee(s) that elect either the Conservative or Alternative Permitting Approachs and then request the de-designation of one or more beneficial uses from a surface water body or all or part of a groundwater basin due to high levels of salinity shall participate in the P&O Study even after the beneficial use de-designation is approved by providing at least the minimum level of required financial support throughout the Phase I program. The P&O Study shall evaluate all areas de-designated based on salinity for suitability as salt management areas.
- Permittee(s) that discharge to a surface water body or a groundwater basin where one or more beneficial uses were de-designated due to salinity prior to the beginning of Phase I of the Salt Control Program shall participate in the P&O Study by providing at least the minimum level of required financial support.

Salinity management is a Central Valley-wide concern and responsibility, and salt management areas are recognized as a key component of any solution in order to move salt out of sensitive areas and consolidate material for efficient de-salinization and potential future transport out of the basin. Areas where beneficial uses have been dedesignated need to be incorporated into the P&O Study to facilitate development of a long-term solution.

Compliance Pathway Selection

A process and schedule for initiation of Phase I of the Salt Control Program and for selection of a compliance pathway during Phase I has been established. For permittees that select the Alternative Salinity Permitting Approach, nothing here prevents, or should be interpreted to prevent, permittees from implementing elements of the Phase I P&O Study prior to receiving a Notice to Comply.

Existing Discharges of Salt

The Central Valley Water Board shall issue a Notice to Comply with the Salt Control Program to existing permittees that discharge salt in the Central Valley Region within one year of the effective date of the Basin Plan Amendments. Upon receipt of the Notice to Comply, permittees receiving the notice will be subject to the Conditional Prohibition of Salinity Discharges (see relevant section in proposed Basin Plan Amendment Language) unless their existing permit has already been updated with the requirements of the Salt Control Program. The Conditional Prohibition of Salinity Discharges establishes enforceable requirements for implementation of Phase I of the Salt Control Program.

No later than six months after receiving the Notice to Comply, existing permittees shall notify the Central Valley Water Board of its decision of whether to be permitted under the Conservative Salinity Permitting Approach or the Alternative Salinity Permitting Approach. Based on the selection of the permitting approach, the permittee shall comply with the following requirements:

- *Conservative Salinity Permitting Approach* – A permittee must submit an assessment of how the discharge will comply with the conservative permitting requirements set forth in the Conservative Salinity Permitting Approach. The permittee shall submit this assessment to the Central Valley Water Board with the notification to the Central Valley Water Board of its permit compliance pathway decision. If the Central Valley Water Board Executive Officer does not concur with the findings of the assessment, the Central Valley Water Board may use its authority to request additional technical and/or monitoring information with a deadline for submittal. When conducting the assessment, the permittee may use historical water quality if it adequately represents the character of the current discharge and/or receiving water and is approved by the Central Valley Water Board Executive Officer.
- *Alternative Salinity Permitting Approach* – A permittee that selects this approach shall participate in the Phase I P&O Study by providing the minimum required level of financial or in–kind support throughout Phase I as determined by the lead entity overseeing the P&O Study. The permittee shall provide documentation of its compliance with the required level of support with the notification to the Central Valley Water Board of its permitting decision. If the permittee has an approved salinity–related Time Schedule Order, Compliance Schedule or variance that expires prior to the completion of the Phase I P&O Study, the Central Valley Water Board, at its discretion, may extend the Time Schedule Order or Compliance Schedule or renew or grant a variance, as appropriate and allowed by other applicable policies.

New or Substantively Modified Discharges

A new permittee, or existing permittee seeking a permit modification due to a substantial and/or material change which increases salt concentration or load from a facility, shall indicate how the permittee intends to comply with the Salt Control Program at the time of application and provide the required information to support the decision, as described above.

Permitted Discharge to a Water Body Subject to Dedesignation of a Beneficial Use

The P&O Study will establish a program for the long-term management of salts in the Central Valley, including identifying locations that may serve as salt management areas in order to move salt away from salt sensitive areas. In order to allow for accumulation of salt in a specific area, beneficial uses must first be dedesignated or discharges would still be required to meet water quality objectives to protect the established uses of the water body in question. Since long-term management of salt is a valley–wide concern that requires a coordinated approach, any review and dedesignation of beneficial uses based on elevated salinity levels must be

conducted under the umbrella of the Alternative Compliance Approach and incorporated into the long-term plan developed under the P&O Study. Accordingly, under the Phase I Salt Control Program:

- Permittee(s) that selects either the Conservative or Alternative Permitting Approach and then requests the de–designation of one or more beneficial uses from a surface water body or all or part of a groundwater basin based on salinity shall participate in the P&O Study even after the beneficial use de–designation is approved by providing at least the minimum level of required financial support throughout the Phase I program. The P&O Study shall evaluate all areas de–designated based on salinity for suitability as salt management areas
- Permittee(s) that discharges to a surface water body or a groundwater basin where one or more beneficial uses were de–designated due to salinity prior to the beginning of Phase I of the Salt Control Program shall participate in the P&O Study by providing at least the minimum level of required financial support.

Failure to Comply

Any permittee that does not submit a response to the Notice to Comply within the required six–month period may be subject to an enforcement action. Permittees who do not respond in the required six-month period are subject to enforcement for failure to respond to the Notice to Comply, but may still select the Alternative Salinity Permitting Approach. Permittees selecting the Alternative Salinity Permitting Approach after the originally allocated six-month period will need to obtain approval from the lead entity conducting the P&O Study to join late, subject to the lead entity's requirements, in addition to providing the minimum required level of financial support.

A permittee that elects to participate in the Alternative Salinity Permitting Approach must continue to provide at least the minimum required level of financial support to the lead entity for the P&O Study throughout the duration of Phase I of the Salt Control Program, unless the Central Valley Water Board has revised the permittee's permit in a manner that authorizes them to be subject to the Conservative Permitting Approach. In such cases, the permittee must remain in compliance with the Alternative Salinity Permitting Approach until such time that their permit is amended to allow compliance under the Conservative Permitting Approach. Where a permittee fails to provide the minimum required level of financial support to the P&O Study, the Central Valley Water Board may require the permittee to comply with the requirements of the Conservative Salinity Permitting Approach.

The lead entity shall be responsible for determining the minimum required level of financial support. In some circumstances, and where appropriate, the lead entity may consider *in lieu* contributions to meet the minimum level of financial support. However, such determinations are at the discretion of the lead entity.

Salt Control Program – Phase I to Phase II Re–Evaluation

Upon completion of Phase I and prior to initiation of Phase II of the Salt Control Program, the Central Valley Water Board will re-evaluate the Conservative and Alternative Salinity Permitting Approaches applicable under Phase I of the Salt Control Program. The Central Valley Water Board shall consider convening a stakeholder group to assist in the re-evaluation. In this re-evaluation, the Central Valley Water Board shall consider the findings of the P&O Study, results from surveillance and monitoring programs, proposals for use of other permitting options or

approaches, and progress made towards meeting the overarching goals of the Salt Control Program. Based on the findings of this re–evaluation, the Central Valley Water Board may modify or re–adopt the Phase I permitting approaches and policies (e.g., variance and exceptions), thereby making them applicable to Phase II. Such amendments must be completed prior to the initiation of Phase II of the Salt Control Program.

Prior to the initiation of Phase II of the Salt Control Program, the Central Valley Water Board will notify all existing permittees in the Central Valley Region of the salinity–related permitting approaches applicable to Phase II. This notification must occur even if the Phase I permitting approaches are re–adopted. The purpose of the notification is to provide the opportunity for permittees to change the compliance pathway selected for Phase I. A permittee that elects to change its compliance pathway shall submit documentation to support the change within 180 days of the Central Valley Water Board notification.

A similar notification process will be utilized prior to the initiation of Phase III of the Salt Control Program.

Figure 4 - 4. General Schedule of Key Phase I Prioritization and Optimization Study Activities and Milestones

Category	Year of Implementation (From Notice to Comply)									
	1	2	3	4	5	6	7	8	9	10
Stakeholder Coordination	Stakeholder Coordination Meetings (as needed frequency)									
	SGMA GSA Coordination Meetings (as needed frequency)									
Phase I Workplan	Phase I Work–plan									
Governance	Phase I Governance Plan	Long-term Governance Plan for Phases II & III								
Funding	Phase I Funding Plan	Long-term Funding Plan for Phases II & III								
Preferred Physical/Non–Physical Salt Management Projects		Development of Recommended Preferred Physical and Non–Physical Projects			Interim Project Report					
						Conceptual Design and Assessment of Environmental Permitting Requirements for Preferred Physical Projects				Final Project Report
Special Studies				Groundwater Quality Trace Constituent Study						
						Recycled Water Imports Study				
								Stormwater Recharge Master Plan Study		
					Emerging Tech Update No. 1				Emerging Tech Update No. 3	
Basin Planning									Phase II Recommendations	
Annual Reports		Progress Reports at Key Milestones (Years 1; 5 and 10 with documentation (electronic or otherwise) of participation)								

Revisions Specific to the Tulare Lake Basin Plan Maximum Average Annual Increase Ground Water Quality Objectives for Salinity and Permit Limits for Boron

The Water Quality Objectives Chapter (Chapter 3) and Implementation Chapter (Chapter 4) of the Tulare Lake Basin Plan specifically recognize the need for managed degradation to allow for salt accumulation from human activity. The Tulare Lake Basin Plan further clarifies that for all discharge categories (Discharges to Navigable Waters; Discharges to Land; Industrial Wastewater; Agricultural Drainage; and Oil Field Wastewater) the degradation will be limited to source water plus 500 µS/cm EC, not to exceed 1,000 umhos/cm, whichever is more stringent. In addition, chloride content of the discharge is limited to 175 mg/L and boron to 1 mg/L. Further, a maximum average annual increase in salinity measured as electrical conductivity was identified as groundwater quality objectives for eight separate Hydrographic Units:

Hydrographic Unit	Max Average Annual Increase (µS/cm)
Westside (North and South)	1
Kings River	4
Tulare Lake and Kaweah	3
Tule River and Poso	6
Kern River	5

The limitations identified have proven restrictive due to salinity concentrations in source water as well as increased conservation and recycling. The groundwater average annual increase objectives have proven difficult to calculate due to limited ambient groundwater data. The current proposal recommends removing the above identified specific EC and chloride limitations and re–evaluate appropriate limitations as part of the P&O Study. The proposal also recommends replacing the 1 mg/L boron limit with a reference to appropriate water quality objectives for boron, which will allow the evaluation of environmental characteristics, including natural background concentration, and water quality conditions that could reasonably be achieved when interpreting narrative water quality objectives.

4.2.1.2 Evaluation of Salt Control Program Alternatives

The two alternatives identified, No Action and Incorporation of a Salt Control Program, were evaluated against the criteria identified through the stakeholder effort and discussed in Section 4.1.4. The evaluation is summarized in Table 4–5.

Table 4 - 5. Evaluation of Salt Control Program Alternatives

Criteria	Alternatives	
	No Action	Salt Control Program
Provide Alternate Drinking Water Supplies	n/a	n/a
Legally Authorize Ag Discharges	M	H
Prevent Further Degradation	H	M/H
Restore Degraded Groundwater	L	M/H
Apply to Diverse Conditions	M	H
Leverage and Maximize Resources	L	H

Notes:
L = Low or Limited
M = Medium ability to address or addressed in some cases or over time
H = High likelihood of being addressed

Provide Alternate Water Supplies: Neither alternative is focused on providing alternative drinking water supplies. Current enforcement authority authorizes the Central Valley Water Board to order replacement water if a permitted discharge is causing or contributing to an exceedance that would impact persons relying on groundwater as their source of drinking water. (Wat. Code, § 13304.)

Legally Authorize Agricultural Discharges: Current regulatory framework allows agricultural discharges as long as appropriate antidegradation findings can be made. In many areas of the Central Valley, groundwater already exceeds conservative interpretations of narrative and numeric objectives of 700/900 EC, which would prohibit receiving water impacts above those numeric values. By the time irrigation water passes through the crop root zone, it may have been concentrated 1.6-fold, so even high quality water protective of sensitive crops (i.e. 700 EC) may have reached a concentration 1,120 EC below the root zone (Ayers & Westcot, 1985). The proposed Salt Control Program takes a phased approach at addressing salt management with the first phase allowing an alternative that allows continued discharge while participating in development of the long-term solution.

Prevent Further Degradation: Current regulatory framework is focused on source control and requires appropriate antidegradation findings to allow discharges of salt. In addition, if a receiving water body already exceeds applicable water quality objectives, further degradation is prohibited and discharges must be at concentrations at or below the applicable objective. The proposed alternative retains existing regulatory authority and provides a conservative pathway to prevent degradation. However, the proposed alternative also provides additional authority to allow controlled degradation while a longer–term salinity management strategy is developed that leads not only to preventing degradation, but also restoration where reasonable, feasible and practicable. Phase I of the proposed alternative includes identification of salt management areas in order to move salt away from sensitive areas. It is anticipated that degradation will occur in the management areas, but productive areas will be maintained and/or restored.

Restore Degraded Groundwater: The current regulatory framework is focused on source control and does not have a framework for restoring groundwater basins on the scale needed for the Central Valley if conservative assumptions are used on the applicable water quality objectives and on protecting every portion of every aquifer to the same level. Authority is currently limited to clean-up activities required pursuant to an enforcement order. The proposed alternative is phased to provide long-term, managed restoration where reasonable, feasible and practicable by incentivizing and encouraging alternative compliance for all permittees that discharge salt.

Apply to Diverse Conditions: Although the current regulatory framework has some flexibility to adjust to local conditions, it does not contain provisions that adjust between basins to recognize potential different appropriate water quality objectives and management goals. The proposed alternative uses the first of three phases to further evaluate existing conditions, impacts of statewide policies and management structures, and available implementation alternatives to develop a strategy that can apply locally as well as valley–wide.

Leverage and Maximize Resources: The current regulatory framework operates permit-by-permit. The proposed alternative provides an option for permittees to collaborate on developing a Central Valley–wide salinity management strategy while maintaining current salinity discharges.

The options identified for elements within the proposed Salt Control Program that caused the most discussion was a potential change to where compliance would be measured under the Conservative Approach. Three options were proposed:

1. Essentially a no action option which would continue location of compliance measurements consistent with current regulatory framework which utilizes a combination of effluent, receiving water or both dependent on the category of discharge;
2. Measuring compliance in the effluent as a conservative means to avoid lengthy and costly justification on potential impacts to receiving waters; and
3. For groundwater discharges, measuring compliance in the "Shallow" groundwater, which lead to discussions on whether the definition of "shallow" should be consistent with the Nitrate Control Program where there is a direct link to depth to domestic wells or dependent on other factors including the potential to develop a default compliance zone based on well construction guidelines.

Preferred option after public discussion was to continue compliance as currently conducted and defer any adjustments until further review under the P&O Study.

4.2.1.3 Recommendation

Incorporate the proposed Salt Control Program

The proposed Salt Control Program will not remove any of the existing authorities of the Central Valley Water Board, but will allow additional authority so that permittees may leverage their resources to develop a long-term salinity management strategy that will recognize diversity within the valley, limit degradation to and protect salt sensitive water bodies, and allow agricultural discharges to continue. The proposed alternative does allow managed degradation over a long time period, but the end result will provide for a stronger economic foundation for the valley by allowing agriculture and other human activities to continue and expand. Removal of the current EC, chloride and boron limits as well as the removal of current consumptive use limits and groundwater degradation rates in the Tulare Lake Basin Plan are appropriate to allow the development of a valley-wide management strategy. The limits may be reviewed as part of the P&O Study and incorporated as part of future implementation.

Staff also recommend that several of the options to the proposed alternative be further evaluated as part of the P&O Study, as follows:

- Determination of appropriate compliance point for discharges to groundwater (e.g. effluent; upper zone; defined shallow zone; etc.)

- Determine whether consumption use guidelines are an appropriate compliance measure for future phases of salt management.

4.2.2 Program to Control and Permit Nitrate Discharges to Groundwater

When evaluating current ambient concentrations of nitrate in groundwater throughout the Central Valley, stakeholders identified a number of specific factors that needed to be considered within any control program:

- Broad area of groundwater basins already exceeded nitrate concentrations considered protective of drinking water supplies with the majority of exceedances occurring in the Tulare Lake and San Joaquin River Basins;

- Higher nitrate concentrations were typically found in the upper zone of the groundwater

basins, which is the shallower zone utilized by domestic wells;

- Limited funding existed to identify impacted domestic users or to provide alternative water supplies; and,
- Agricultural operations were one recognized source of nitrate pollution, but the industry was needed to maintain the economic engine within the Central Valley including supporting communities impacted by the elevated nitrate concentrations.

4.2.2.1 Alternatives

The alternatives developed and considered for the control and permitting of nitrate discharges to groundwater in the Sacramento–San Joaquin River Basins and in the Tulare Lake Basin (Nitrate Control Program) are intended to apply to all groundwater basins that are designated with the municipal and domestic supply (MUN) beneficial use.[32] Three major alternatives were considered: 1) No Action Alternative; 2) Incorporate a Nitrate Control Program with New Authorities; and 3) Incorporate a Nitrate Control Program that Clarifies Use of Current Central Valley Water Board Authorities

4.2.2.1.1 No Action Alternative

The no action alternative is to continue regulation of nitrate discharges under the current regulatory framework discussed in Section 2.2 and Appendix C and requires no additional Basin Plan Amendments. The framework focuses on source control, compliance with applicable water quality objectives at all points in the groundwater aquifer, and implementation of the State Antidegradation Policy. Current regulatory authority is focused permit-by-permit and requires discharges to meet applicable water quality objectives (for protection of MUN the objective is 10 mg/L nitrate as nitrogen) if the receiving water already exceeds those objectives and provides a limited time period for permittees to come into compliance. Discharges to high quality water bodies (water bodies that have nitrate concentrations below 10 mg/L nitrate as nitrogen) that will increase ambient nitrate concentrations but remain below the water quality objective, must satisfy antidegradation requirements. Compliance is measured in the shallowest portion of the saturated zone of the aquifer. Current enforcement authority allows the Central Valley Water Board to require the provision of replacement water if the discharge is causing or contributing to pollution and to clean up the impacted water body to concentrations at or below the applicable water quality objective. (Wat. Code, § 13304.)

4.2.2.1.2 Alternative to Incorporate a Nitrate Control Program with New Authorities

Under the Nitrate Control Program alternatives, there were specific elements recommended in the CV-SALTS SNMP (2016) and options to those elements identified through further stakeholder meetings and Board workshops. A list of Nitrate Control Program elements and options identified are provided in Table D–1 in Appendix D. Where agreement on approach was not reached, options are identified below by element.

4.2.2.1.2.1 Overview

Several groundwater basins and sub-basins in the Central Valley currently have extensive areas that exceed the water quality objective for nitrate, which is set at the primary maximum contaminant level of 10 mg/L–N for drinking water. In addition, supporting studies identified that the cost for treating groundwater that exceeds 10 mg/L–N to be in the range of $36 to $81

[32] The implementation provisions in this Nitrate Control Program apply to discharges of nitrate to groundwater. To extent that the Central Valley Water Board uses other forms of nitrogen speciation (e.g., total Nitrogen and nitrite+nitrate) to address nitrate discharges, this Control Program would also apply in those circumstances.

billion, and in some scenarios would take more than 70 years for groundwater to meet the standard. This alternative proposes an approach that is consistent with the following prioritized management goals:

Goal 1 – Ensure a Safe Drinking Water Supply (short-term and long-term);
Goal 2 – Achieve Balanced Salt and Nitrate Loadings; and,
Goal 3 – Implement Managed Aquifer Restoration where reasonable, feasible and practicable.

The timeframe for meeting these three goals is largely unknown and will vary from basin to basin. Further, it may not be reasonable, feasible or practicable to achieve balanced loadings or fully restore groundwater in some basins/sub-basins. For other basins, it may take multiple decades to achieve the goals of the SNMP. In some limited cases, where restoration of the groundwater basin for MUN uses may not be reasonable, feasible or practicable it may be necessary for the Central Valley Water Board to consider dedesignating MUN beneficial use from that groundwater basin.

The Nitrate Control Program is prioritized to first address health risks associated with drinking water that exceeds the nitrate primary maximum contaminant level (i.e., nitrate drinking water standard). Priority Groundwater Basins/Sub-basins[33] have been identified based on ambient nitrate conditions, and timelines have been established for implementation of the Nitrate Control Program in these prioritized basins and sub-basins. Implementation of the Nitrate Control Program in non-prioritized basins and sub-basins will occur as directed by the Central Valley Water Board's Executive Officer. In areas of the Central Valley where there are no identified groundwater basins or sub-basins, the Nitrate Control Program will apply when the Central Valley Water Board's Executive Officer determines it is necessary and appropriate to address nitrate discharges to localized groundwater and notifies the permittee accordingly.

Permitted dischargers within the prioritized basins and sub-basins that have received notice must generally assess nitrate levels in groundwater used for MUN that may be impacted by nitrate discharge(s). The assessment, using readily available data and information, must determine if the groundwater in question is a safe, reliable source of drinking water with respect to nitrates. If the groundwater is impacted, and if the discharger is causing to an exceedance of nitrate in the groundwater in public water supply or domestic wells beyond the primary maximum contaminant level, then the permitted discharger shall submit an Early Action Plan (EAP) that includes specific actions and a schedule of implementation to address the immediate needs of those drinking groundwater from public water supply or domestic wells that exceed the primary maximum contaminant level for nitrate.

For longer–term implementation of the Nitrate Control Program, the Central Valley Water Board's permitting actions specific to nitrate discharges to groundwater will fall within one of the two following approaches:

- Individual Approach (Path A) is the approach utilized when an individual discharger (or third party group subject to a General Order wishing to proceed under Path A) decides to comply with the nitrate requirements as an individual/third party, or in circumstances when a management zone is not an available option.

[33] The prioritized Groundwater Basins/Sub-basins identified in the public draft, including identification per DWR's Bulletin 118, are from Luhdorff and Scalmanini Consulting Engineers and Larry Walker Associates (2016a), and the Central Valley Water Board may adjust these priorities during the public review process.

- Management Zone Approach (Path B) is the approach utilized when multiple dischargers/permittees elect to participate in a management zone as the preferred method for complying with the Nitrate Control Program.

Path A is considered the default permitting approach, while Path B is an optional approach. Where appropriate, the Central Valley Water Board will encourage permitted dischargers to work cooperatively with each other and other stakeholders to implement the Nitrate Control Program through a Management Zone.

The Nitrate Control Program provides the Central Valley Water Board with flexibility and authority to permit discharges of nitrate to groundwater using Alternative Compliance mechanisms rather than traditional permitting determinations. The Central Valley Water Board's options for Alternative Compliance include: (1) determining availability of assimilative capacity on a volume–weighted average basis for a management zone; (2) granting a conditional exception for meeting nitrate water quality objectives in discharges and/or in groundwater; and, (3) offsets. To authorize Alternative Compliance through any of these options, the Central Valley Water Board must approve an Alternative Compliance Project as part of the authorization. A fundamental element of any Alternative Compliance Project is that it must ensure that groundwater users impacted by discharges of nitrates have access to drinking water that meets state and federal drinking water standards, and must provide specific milestones and timelines for meeting all three management goals of the program. In circumstances where it is not reasonable, feasible or practicable to meet management goal 2 and/or goal 3, permittees must still indicate how discharges of nitrate will be controlled to the extent that is reasonable, practicable and feasible.

The Nitrate Control Program protects high quality groundwater by establishing nitrate triggers. Nitrate triggers are not water quality objectives themselves. The Central Valley Water Board may authorize a discharge, or collective discharges in a Management Zone, to exceed a nitrate trigger level, but to do so the Central Valley Water Board must approve an Alternative Compliance Project, except in limited and unique circumstances.

To ensure a transparent process, there are several points between a Notice to Comply and modification of permit provisions where interested persons may review and comment on the process:

- Preliminary Management Zone (posted on Board's website, comments with consideration)
- Early Action Plan (posted on Board's website)
- Notice of Intent – Path A (comment period and hearing if permit revision required)
- Final Management Zone Proposal (posted on Board's website)
- Management Zone Implementation Plan (will be incorporated into permit(s), thus will be posted on Board's website, comment period, and hearing)

4.2.2.1.2.2 Management Zone Concept

A fundamental element of this proposed Nitrate Control Program alternative is to amend the Basin Plans to include criteria for establishment and regulation of Management Zones for the purposes of groundwater quality management and control of nitrate. Groundwater Management Zone elements are summarized below.

a) Management zones would be a discrete regulatory compliance unit for the purposes of complying with WDRs for nitrate. Permittees have the discretion to join a management zone or continue to be permitted as an individual (or group under general WDRs).

   Other Option Considered: Management zones would not be available for evaluating compliance with WDRs; only as a means for collaborative groundwater basin monitoring, modeling, and other related assessment activities. (Discussed in third alternative)

b) A minimum requirement of a management zone implementation plan is to be consistent with the management goals of the Nitrate Control Program including: (1) addressing short-term and long-term drinking water needs affected by nitrate, (2) plan for achieving balanced nitrate loadings within the management zone (to the extent feasible and reasonable), and (3) plan for establishing a managed aquifer restoration program to restore nitrate levels to concentrations at or below the water quality objectives to the extent it is feasible and reasonable to do so.

   Other Option Considered: Include a goal to achieve balance and restore aquifer within 50 years.

c) Management zones would only be applied for the regulation and control of nitrate.

d) A management zone can be larger than one groundwater basin/sub-basin for administrative purposes, including providing drinking water within the area covered by the entire management zone. However, when developing implementation plans within a management zone, these plans should be developed only for areas that are hydrologically connected. In addition, assimilative capacity may only be allocated within hydrologically connected areas.

Specific requirements for development and responsibilities of management zones are described in more detail under the Management Zone Approach (Path B) discussion.

4.2.2.1.2.3 Prioritized Approach

Considering the extent and size of the Central Valley Water Board's jurisdictional boundaries, it is necessary to categorize and prioritize the region's groundwater basins/sub-basins based on currently known ambient water quality conditions (where information is available), location (e.g., valley floor versus foothill and mountainous areas), and areas that are not part of an identified basin/sub-basin.

Priority Basins and Sub-basins

Basins/sub-basins have been prioritized, with Priority 1 and 2 identified as having the most serious ambient water quality concerns for nitrate in the upper zone (shallow aquifer representing domestic well use) based on evaluations in the CV-SALTS SNMP (2016). Priority 1

and 2 Groundwater Basins/Sub-basins are identified in Table 4–6 and are depicted in Figure 4–5. All priority basins are located on the floor of the Central Valley.

Non Prioritized Basins/Sub-basins

Groundwater Basins/Sub-basins that are not currently prioritized are identified in Appendix E. These basins/sub-basins or areas with the basins/sub-basins may be designated as a high priority on a case–by–case basis when determined necessary by the Central Valley Water Board.

Areas within Central Valley Water Board Jurisdictional Boundary That Are Not Part of a Basin/Sub-basin

Due to geologic conditions, some areas within the Central Valley Water Board's jurisdictional area are not part of an identified groundwater basin/subbasin. These areas tend to be outside of the valley floor, and nitrate concerns in drinking water are generally not an issue of concern.

Central Valley Water Board Review of Priorities

No later than January 1, 2024, the Central Valley Water Board shall review the priorities listed in Table 4–6, and may adjust these priorities after considering water quality–based factors, and other relevant information. Factors the Central Valley Water Board may consider in its review include, but are not limited to, the following:

(1) Degree to which areas (or subareas) with known nitrate drinking water supply contamination will be addressed under the current prioritization;

(2) Additional data/information provided by discharger(s) and/or other stakeholders within a basin/sub-basin (or subarea) that demonstrates that the nitrate concerns have or have not been addressed or will be addressed via another program or activity;

(3) Degree to which the area identified by water quality factors actually has impacted drinking water users (i.e., drinking water is predominately a surface water supply or drinking water supplies are primarily groundwater);

(4) Changes in groundwater basin/sub-basin boundaries by the Department of Water Resources, which may affect the spatial order as presented in Table 4 - 6; and

(5) Maximization of efficient use of resources, which may affect the number of basins/sub-basins (or subareas) that may be included on the prioritized schedule of implementation.

Figure 4 - 5. Prioritized DWR Bulletin 118 Groundwater Basins/Subbasins

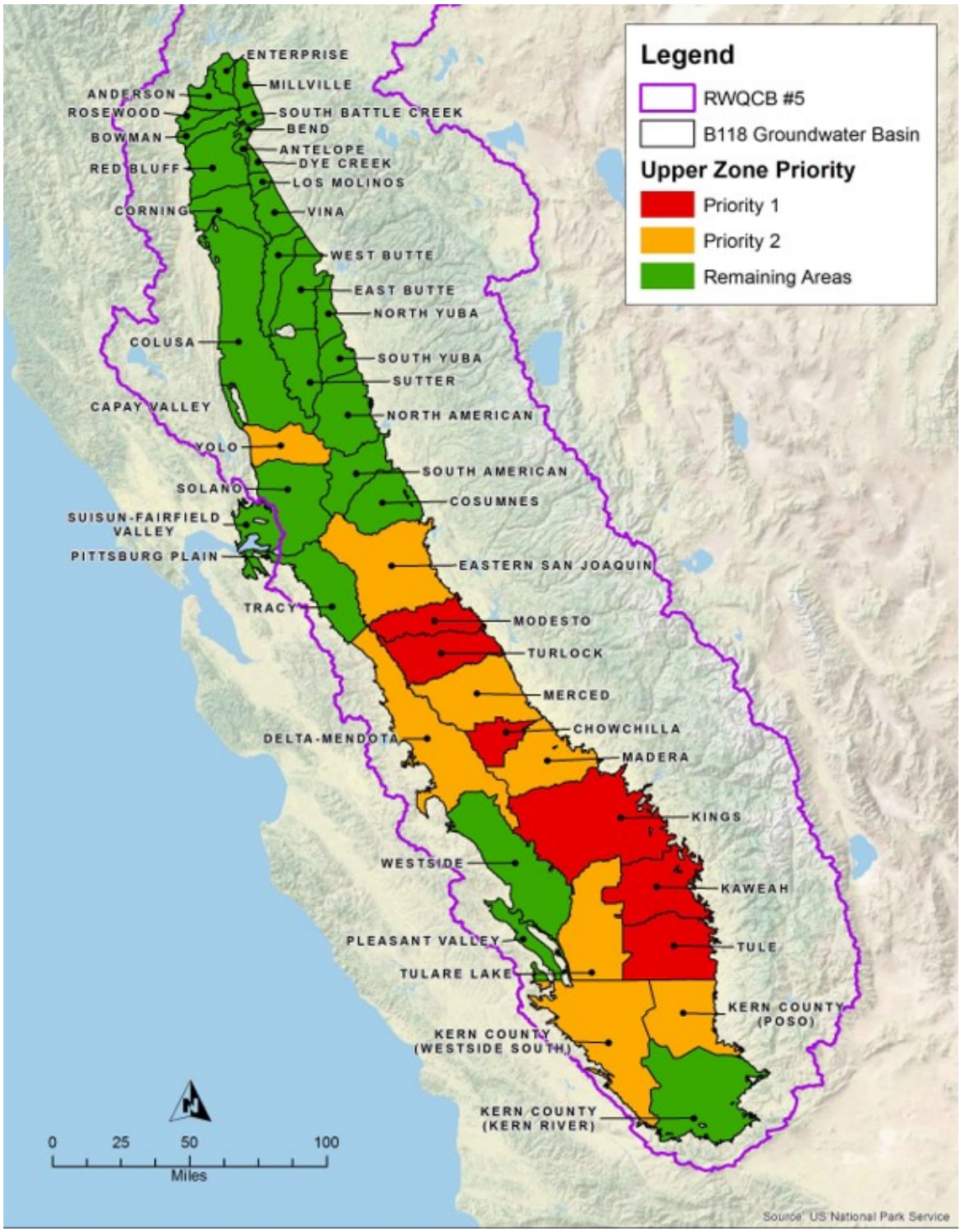


Table 4 - 6. Prioritized DWR Bulletin 118 Groundwater Basins/Subbasins

PRIORITY 1		PRIORITY 2	
5–22.11	Kaweah	5–21.67	Yolo
5–22.03	Turlock	5–22.04	Merced
5–22.05	Chowchilla	5–22.14	Kern County (Westside South)
5–22.13	Tule	5–22.12	Tulare Lake
5–22.02	Modesto	5–22.14	Kern County (Poso)
5–22.08	Kings	5.22–07	Delta Mendota
		5–22.01	Eastern San Joaquin
		5–22.06	Madera

4.2.2.1.2.4 Nitrate Control Program Implementation

Existing Permitted Dischargers[34]

The Nitrate Control Program establishes timelines for implementation based on the priority designation of the groundwater basin/sub-basin, or lack of location within a groundwater basin/sub-basin. Implementation of the Nitrate Control Program for existing permitted dischargers occurs when notification is received from the Central Valley Water Board through the issuance of Notices to Comply. The Board will issue Notices to Comply according to the schedule in Table 4–7. The Executive Officer of the Board retains discretion to adjust the timelines in Table 4–7 based on available resources.

New or Expanding Dischargers

After the effective date of the Nitrate Control Program, new dischargers located in groundwater basin/sub-basin (regardless of priority) or those with a material change to their operation that increases the level of nitrate discharged to groundwater must comply with the Nitrate Control Program and provide data and information as applicable. This provision does not apply to dischargers located in areas that are not part of a designated basin/sub-basin unless the Executive Officer of the Central Valley Water Board determines based on the specific facts of the discharge that it should be subject to the Nitrate Control Program and the Executive Officer of the Board notifies the discharger accordingly.

[34] For the purposes of the Nitrate Control Program, the term “existing permitted dischargers” means dischargers subject to individual Waste Discharge Requirements, dischargers regulated as individual facilities under General Waste Discharge Requirements (e.g., facilities regulated under the Waste Discharge Requirements General Order for Existing Milk Cow Dairies), facilities or discharges subject to Conditional Waivers, or dischargers subject to General Waste Discharge Requirements that are regulated through a Third Party (e.g., dischargers regulated under Irrigated Lands Regulatory Program’s Third–Party General Orders). For those dischargers that are part of a third party group, notifications required by the Nitrate Control Program may be issued to and received from the Third Party group on behalf of their members, who in turn will be responsible for notifying its members.

Table 4 - 7. Timeline for Issuance of Notice to Comply with Nitrate Control Program

Basin Priority	Time for Issuance of Notice to Comply
Priority 1 Basins	As soon as is reasonably feasible after the effective date of the Nitrate Control Program, but no later than 1 year from xxxx (effective date).
Priority 2 Basins	Within 2 to 4 years after effective date of the Nitrate Control Program.
Basins/sub-basins not Prioritized	Based on available resources, and as determined necessary by the Executive Officer of the Central Valley Water Board.
Areas that are Not Part of a Basin	As determined necessary by the Executive Officer of the Central Valley Water Board.

Community Request

Nothing in the Nitrate Control Program is intended to prevent or prohibit a community from specifically requesting that the Central Valley Water Board subject a basin, sub-basin, or portion thereof to the Nitrate Control Program in advance of the timelines identified here. Upon such a request, the Central Valley Water Board will consider the same factors evaluated during initial prioritization utilizing any additional information provided and will consider whether the request appropriately enhances ongoing efforts to address nitrate contamination on a region-wide scale.

Permittees Requesting Deferral for a Sub-basin or Portion of a Sub-basin

Permittees may request that, for a sub-basin or a portion of a sub-basin, the Central Valley Water Board defer the issuance of Notices to Comply so that the notices for that sub-basin or portion of a sub-basin are issued along with the notices issued for a lower priority basin. Such a request must be accompanied by documentation related to the factors considered during the original prioritization. The request may be provided at any time up to six months prior to the scheduled issuance of a Notice to Comply as outlined in the section titled *Implementation of Permitting Approach*es.

Permitting Approaches

Long-term implementation of the Nitrate Control Program will occur through updates of existing waste discharge requirements or conditional waivers, or through the issuance of new waste discharge requirements or conditional waivers for new sources of nitrate. Permit actions must fall under one of the two following approaches (Figure 4–6):

(1) Individual Permitting Approach (Path A): Individual requirements (or per a General Order); or,

(2) Management Zone Approach (Path B): Participation in a Management Zone.

Path A – Individual Permitting Approach

Path A applies to all permitted dischargers unless the discharger affirmatively elects to participate in the Management Zone Approach under Path B. For Path A, nitrate discharge impacts to groundwater are assessed in shallow groundwater underlying the area of discharge,

otherwise referred to as the "Shallow Zone." What constitutes the Shallow Zone in any given area may vary but the purpose is to represent the area of the aquifer available for use by the shallowest domestic wells. To determine ambient nitrate concentrations in the Shallow Zone for purposes of the Nitrate Control Program only, several options are available:

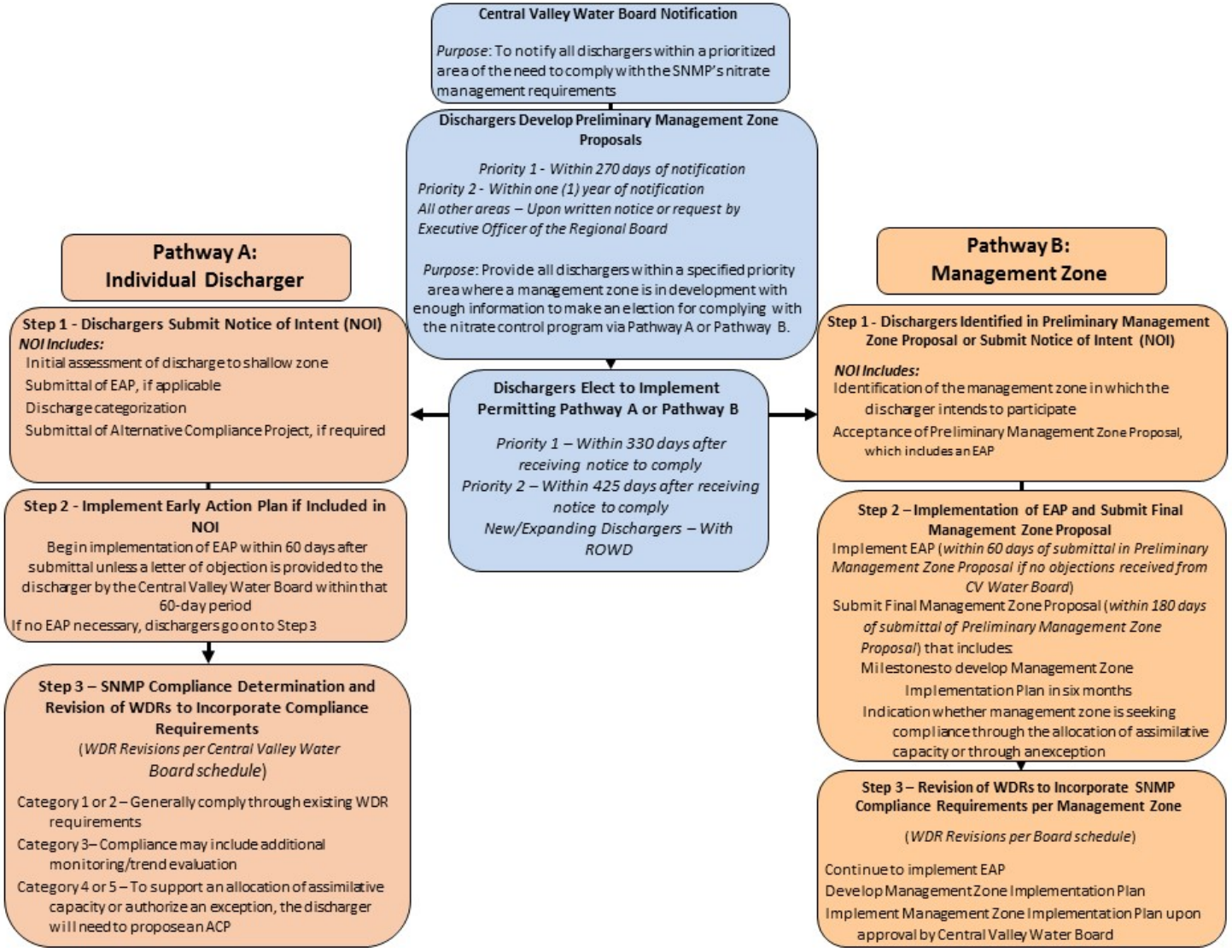
(1) Use readily available data and information to calculate ambient nitrate concentrations for the shallowest ten percent (10%) of the domestic water supply wells in the Upper Zone[35] of a groundwater basin/sub-basin as defined and established in *Region 5: Updated Groundwater Quality Analysis and High Resolution Mapping for Central Valley Salt and Nitrate Management Plan* (June 2016);

(2) Conduct a site (or area) specific evaluation based on various types of available data and information, including but not limited to, depth and age of domestic wells in the area of contribution, groundwater table, well completion report data, and other available and relevant information; or,

(3) An equivalent alternative approved by the Central Valley Water Board's Executive Officer.

[35] Upper Zone is defined to mean, "the portion of groundwater basin, sub-basin or management zone from which most domestic wells draw water. It generally extends from the top of the saturated zone to the depth to which domestic wells are generally constructed (screened). The lower boundary of the upper zone varies based on well construction information for a given basin or sub-basin. The Corcoran Clay layer may define the lower boundary of the upper zone or the lower zone, pending the available well construction and groundwater use information."

Figure 4 - 6. Nitrate Permitting Strategy



Based on the impact of the discharge to the Shallow Zone and the quality of the discharge over a 20-year planning horizon, nitrate discharges will be characterized and placed into one of five categories to help determine regulatory provisions (Table 4-8).

> Other Option Considered: Utilize three categories instead of five (discussed in Alternative 3).

Central Valley Water Board determinations regarding availability and allocation of assimilative capacity will be based on ambient water conditions in the Shallow Zone. The Shallow Zone provides a conservative estimate of overall ambient concentration in the aquifer since it represents a small portion of the aquifer near the top of the saturated zone that typically contains the highest nitrate concentrations. As such, the Shallow Zone represents the shallowest portion of the aquifer utilized by domestic well users and also provides information on potential movement of nitrate into deeper portions of the aquifer

To protect high quality groundwater throughout the Central Valley, a nitrate trigger level of 75% of the water quality objective for nitrate is recommended. Concentrations above the trigger would require more aggressive regulation of discharges to ensure that concentrations do not exceed the water quality objective and impact drinking water supplies. The trigger level is not a water quality objective. Permitted discharges that cause or may cause nitrate in the Shallow Zone to exceed a nitrate trigger may be subject to development and implementation of an Alternative Compliance Project.

In addition to a single concentration to trigger additional control efforts, Categories 3 and 4 include trigger language regarding trending of water quality upwards toward or exceeding the water quality trigger over the 20-year planning horizon.

- For category 3 – Discharges will be considered as part of this category if the discharge occurs in a basin where the permittee(s) anticipate using more than a *de minimis* amount of available assimilative capacity but the receiving water will not exceed a trigger of 75 percent of the water quality objective for nitrate over a 20-year planning horizon. To allow use of assimilative capacity in this circumstance, the Central Valley Water Board may find it necessary to include additional monitoring and trend evaluations as part of the WDRs in order to make appropriate findings consistent with the State Antidegradation Policy.

- For category 4 – Discharges will be considered as part of this category if they utilize available assimilative capacity in the receiving water and use of that assimilative capacity can be reasonably anticipated to cause the receiving water to exceed the trigger of 75 percent of the water quality objective for nitrate over a 20-year planning horizon but remain below the water quality objective. To allow assimilative capacity here, the permittee would need to submit an Alternative Compliance Project proposal to the Central Valley Water Board to be included as an additional condition in the WDRs in order to make appropriate findings consistent with the State Antidegradation Policy.

The proposed categories provide the basis for determining whether a permittee must seek an alternative compliance pathway. The categories depend on both the concentration of the discharge and the discharge's impact on water quality. An individual discharger that falls within categories 3, 4, or 5, would need to conduct an initial assessment to determine if the discharge

(or collective discharges if under a General Order) is causing any nearby public water supply or domestic wells to exceed drinking water standards for nitrate.

If there is an initial finding that the nitrate trend would approach or exceed the trigger over a 20-year planning horizon, the discharger would be allowed to collect additional data and/or conduct additional analyses prior to requiring an Alternative Compliance Project proposal be submitted.

In general, allocation of assimilative capacity above a trigger level or the need for an exception to meeting water quality objectives is considered a means of alternative compliance and requires the support of an Alternative Compliance Project. The alternative compliance pathway would likely include participation in projects to deliver drinking water to communities with nitrate–impaired wells and to participate in projects to improve ambient groundwater quality in the long term.

When allocating assimilative capacity to an individual discharger and the individual discharger is within a management zone (Path B), the Central Valley Water Board will need to consider impact to available assimilative capacity in the management zone.

Path B –Management Zone Approach

Permittees with nitrate discharges may elect to comply with the Nitrate Control Program by participating in a Management Zone. The goal of the Management Zone approach is to maximize resources to address the varying degrees of nitrate concentrations found in groundwater basins/sub-basins, and provide a more integrated approach to developing local solutions for localized areas of contaminated groundwater. Management Zones are a type of "Alternative Compliance Project" since they do not fall within the conventional permit-by-permit regulatory framework and are subject to Alternative Compliance Project requirements. Table 4-9 summarizes the characteristics, intent and purposes of a Management Zone.

Individual nitrate discharges from permittees participating in a Management Zone are not categorized like discharges in Path A. Rather, impacts to groundwater are assessed collectively in the upper zone, which is defined to mean, "the portion of groundwater basin, sub-basin or management zone from which most domestic wells draw water. It generally extends from the top of the saturated zone to the depth to which domestic wells are generally constructed (screened). The lower boundary of the upper zone varies based on well construction information for a given basin or sub-basin. The Corcoran Clay layer may define the lower boundary of the upper zone or the lower zone, pending the available well construction and groundwater use information."

For a Management Zone, determinations of available assimilative capacity are based on a volume–weighted average of nitrate concentrations in the Upper Zone.

Table 4 - 8. Nitrate Discharge Categories

Category	Discharge Quality and Impact to Groundwater
Category 1 No Degradation	Discharge quality, as it reaches the Shallow Zone[36], is better than the applicable water quality objective and is better than the average nitrate concentration in the Shallow Zone.
Category 2 *De Minimis* Impacts	The average nitrate concentration in the Shallow Zone is better than the applicable water quality objective, and, over a 20-year planning horizon: • The effect of the discharge on the average nitrate concentration in the Shallow Zone is expected to use less than 10% of the available assimilative capacity in the Shallow Zone; and • The discharge, in combination with other nitrate inputs to the Shallow Zone, is not expected to cause average nitrate concentrations in the Shallow Zone to exceed a nitrate trigger of 75% of the applicable water quality objective.
Category 3 Degradation Below Trigger	The average nitrate concentration in the Shallow Zone is better than the applicable water quality objective. Estimated that discharge is more than *de minimis*, but will not cause the average nitrate concentration in the Shallow Zone to exceed a trigger of 75% of the applicable water quality objective over a 20-year planning horizon.
Category 4 Degradation Above Trigger	The average nitrate concentration in the Shallow Zone is better than the water quality objective. Though the discharge is reasonably expected to cause the average nitrate concentration in the Shallow Zone to exceed a trigger of 75% of the applicable water quality objective over a 20-year planning horizon, the average nitrate concentration in the Shallow Zone is expected to remain at or below the applicable water quality objective over the same 20-year planning horizon.
Category 5 Discharge Above Objective	Either: • The average nitrate concentration in the Shallow Zone is better than the applicable water quality objective, but the discharge may cause the average nitrate concentration in the Shallow Zone to exceed the water quality objective over a 20-year planning horizon; or, • The average nitrate concentration in the Shallow Zone exceeds the applicable water quality objective and the discharge quality, as it reaches the Shallow Zone, also exceeds the applicable water quality objective.

[36] For the purposes of this Table, the "Shallow Zone" is the portion of the aquifer whose areal extent is defined by the boundaries of the discharge area and whose vertical extent is defined by the depth of the shallowest 10% of the domestic water supply wells near the discharge or an equivalent alternative.

Table 4 - 9. Characteristics, Intent and Purpose of a Management Zone

Characteristics ▪ A defined area which incorporates a portion of a groundwater basin(s)/sub-basin(s) ▪ Encompasses all groundwater within the zone of contribution for those permittees that discharge nitrate to said groundwater that have selected to comply with the Nitrate Control Program through participation in the defined Management Zone. ▪ Voluntarily proposed by those regulated permittees located within the proposed management zone boundary that have decided to work collectively and collaboratively to comply with the nitrate control program.
Intent and Purposes ▪ Defined area that serves as a discrete regulatory compliance unit for complying with the Nitrate Control Program. ▪ Basis for the establishment of local management plans to manage nitrate within the management zone's boundary. ▪ Participants work collectively to implement SNMP management goals: (1) safe drinking water, (2) achieving balance, and (3) restoring groundwater basins/sub-basins (where reasonable, feasible and practicable) across the Management Zone. ▪ Where groundwater within the Management Zone boundary is being used as a drinking water supply, and where those drinking water supplies are impacted by nitrates and exceed or are likely to exceed nitrate drinking water standards in the foreseeable future, Management Zone participants will ensure the provision of safe drinking water to all residents in the area adversely affected by dischargers of nitrates from those that are participating in the Management Zone. ▪ Ensure the provision of safe drinking water for the Management Zone through stakeholder coordination and cooperation. ▪ Work towards better resource management through appropriate allocation of resources. ▪ Central Valley Water Board imposes reasonable provisions collectively for the Management Zone, and its permittee participants, that recognize the need to prioritize nitrate management activities over time for compliance with the Nitrate Control Program

Implementation of Permitting Approaches

Due Dates for Deliverables

To implement the Permitting Approaches set forth in this control program, permittees need to provide the Central Valley Water Board with information regarding their discharge of nitrate. Deadlines for submitting this information varies based on the priority of the basin/sub-basin, and the permitting approach selected. Table 4-10 and Table 4-11 identify the various deliverables based on which permitting approach a discharger seeks to follow, and associated due dates for these deliverables.

Notification and deliverable dates have been staggered to recognize the number of permittees that must be notified and tracked through each Priority Phase of the proposed program. Approximately 232 permittees will be notified under Priority 1, approximately 322 permittees under Priority 2, with 863 permittees remaining for future notification. Of the remaining 863 permittees, 515 discharge outside of identified groundwater basins. The number of permittees noted above include ILRP General Orders for Agricultural Coalitions as well as the Dairy General Order. Each of these orders covers many individual operations and substantial acreages. Notifications and updates will also be required for Local Agency Management Programs (LAMPS) that cover Onsite Wastewater Treatment Systems (septic systems).

Table 4 - 10. Pathway A, Summary Schedule for Implementation

Deliverable	Application	Due Dates[a]	
Initial Assessment/Notice of Intent	All existing and new permittees electing Pathway A.	Existing Permittees –Priority 1 Basins/Sub-basins	330 days after receiving Notice to Comply
		Existing Permittees –Priority 2 Basins/Sub-basins & Non–Prioritized Basins	425 days after receiving Notice to Comply
		New or Expanding Dischargers	With Report of Waste Discharge
Early Action Plan	Required if permittee is causing any public water supply or domestic well to exceed nitrate water quality objective.	To be submitted with Notice of Intent and initiated within 60 days if no objection received by the Central Valley Water Board	
Alternative Compliance Project if needed	Required for Category 4 and Category 5 Permittees	To be submitted with Notice of Intent	

Notes: [a] The Executive Officer of the Central Valley Water Board retains the discretion to extend the due dates identified here for submittal of identified deliverables if proper justification is provided to the Executive Officer at least 30 days prior to required date for submittal.

Table 4 - 11. Pathway B, Summary Schedule for Implementation

Deliverable	Application	Due Dates[a]	
Notice of Intent	All existing and new permittees electing Pathway B.	Existing Permittees –Priority 1 Basins/Sub-basins	330 days after receiving Notice to Comply
		Existing Permittees –Priority 2 Basins/Sub-basins & Non–Prioritized Basins	425 days after receiving Notice to Comply
		New or Expanding Permittee	With Report of Waste Discharge
Preliminary Management Zone Proposal	Permittees electing Path B that are actively participating in development of Preliminary Management Zone Proposal.	Existing Permittees –Priority 1 Basins/Sub-basins	270 days after receiving Notice to Comply
		Existing Permittees –Priority 2 Basins/Sub-basins & Non–Prioritized Basins	1 year after receiving Notice to Comply
		New or Expanding Permittees	With Report of Waste Discharge
Early Action Plan	Required element of Preliminary Management Zone Proposal for public water supply and domestic wells within the Management Zone area that exceed nitrate water quality objective.	To be submitted with Preliminary Management Zone Proposal and initiated within 60 days if no objection received by Central Valley Water Board	
Alternative Compliance Project if needed	Equivalent to Management Zone Implementation Plan noted below		
Final Management Zone Proposal		180 days after receiving comments from Central Valley Water Board on Preliminary Management Zone Proposal	
Management Zone Implementation Plan		Six (6) months after the Final Management Zone Proposal is accepted by the Executive Officer of the Central Valley Water Board.	

Notes: [a] The Executive Officer of the Central Valley Water Board retains the discretion to extend the due dates identified here for submittal of identified deliverables if proper justification is provided to the Executive Officer at least 30 days prior to required date for submittal.

Deliverables

Initial Assessment/Notice of Intent (Path A)

Permittees, or those seeking a permit to discharge that includes the discharge of nitrate, must prepare an Initial Assessment and Notice of Intent, unless the discharger is actively engaged in developing a Management Zone proposal and is identified as an initial participant in a Preliminary Management Zone Proposal submitted pursuant to Path B.

Existing Permitted Dischargers

Upon receipt of a Notice to Comply, existing permittees shall conduct an initial assessment of their discharge as it relates to nitrate. The initial assessment shall be submitted as part of a Notice of Intent and must include the following:

(x.) Estimated impact of discharge of nitrate on the Shallow Zone over a 20-year planning horizon;
- May be estimated based on a simple mass balance calculation assuming 20 years of loading as nitrate reaches the water table.
- Initial assessment of water quality conditions based on readily available existing data and information.
- May use default information in or referenced by, the Central Valley SNMP or provide supplemental information that includes water quality conditions in the shallow and upper zones;[37]

(xi.) Survey of the discharge, and determination if the discharge is causing any public water supply or domestic well to be contaminated by nitrate;

(xii.) If causing contamination of a public water supply or domestic well, an Early Action Plan; Identification/summary of current treatment and control efforts, or management practices;[38]

(xiii.) Identification of any overlying or adjacent Management Zone;

(xiv.) Identification of Category of the Discharge, and information to support the categorization;[39]

(xv.) Information necessary to support request for allocation of assimilative capacity, if applicable;

[37] Dischargers may rely on previous groundwater assessments conducted by the discharger, assessments conducted by others that are applicable and relevant, or previous antidegradation analysis that have been submitted to the Central Valley Water Board.

[38] If the discharger seeking compliance through this option is a third party submitting the NOI on behalf of the individual members of the third party, the third party will need to take reasonable efforts to summarize the management practices being used by its members with respect to protecting groundwater quality from the impacts of nitrates from member farming operations.

[39] If the discharger seeking compliance through this option is a third party submitting the NOI on behalf of the individual members of the third party, the third party will need to take reasonable efforts to categorize the various geographic areas as covered by the third party general order.

(xvi.) For category 4 dischargers, identification of an Alternative Compliance Project or justification as to why the Central Valley Water Board should not require implementation of an Alternative Compliance Project.

(xvii.) For category 5 dischargers, information as required to support an Application for an Exception pursuant to the Exceptions Policy, which would include identification of an Alternative Compliance Project.

Previous groundwater assessments conducted by the discharger (or third party group on behalf of collective dischargers), and/or antidegradation analyses that have been submitted and approved by the Central Valley Water Board's Executive Officer may satisfy all or part of initial assessment requirement.

Recycled Water Permittees

Permittees for the distribution and use of recycled water recycled water that meets the requirements of Title 22 of the California Code of Regulations may substitute the information requested above with the same information that is otherwise required for a Recycled Water Application under State Water Board Order No. 2014–0090–DWQ, General Waste Discharge Requirements for Recycled Water Use.

New Dischargers, or Existing Permitted Dischargers Proposing Material Changes to their Regulated Discharge

New dischargers that propose to discharge new or additional levels of nitrate[13], or existing dischargers seeking a permit modification due to a material change to a facility that requires submittal of a Report of Waste Discharge and that includes an increase in nitrate discharges (either in volume or concentration), shall include the initial assessment information at the time of submittal of the Report of Waste Discharge. If a Management Zone exists for the area where the new or expanded discharge shall occur, the discharger shall indicate how the discharger intends to comply with the Nitrate Control Program, i.e., Path A or Path B. If a Management Zone does not exist at the time of application, the Central Valley Water Board may use its discretion to issue a time schedule to the discharger for complying with the Nitrate Control Program through a later formed Management Zone.

Option In lieu of Individual Initial Assessment/Notice of Intent

In lieu of conducting an initial assessment and submitting a Notice of Intent, existing permitted dischargers may work collaboratively and cooperatively to prepare a Preliminary Management Zone Proposal that meets the requirements specified under Path B.

Preliminary Management Zone Proposal (Path B)

Existing permitted dischargers may work cooperatively to prepare a single Preliminary Management Zone Proposal for an identified geographic area. A Preliminary Management Zone Proposal must include all of the following:

(i.) Proposed preliminary boundaries of the Management Zone area;

[13]In cases where there is an ownership transfer of a facility and where the level of nitrate being discharged does not change, an initial assessment may not be necessary.

(ii.) Identification of Initial Participants/Permittees;

(iii.) Identification of other permittees and stakeholders in the management zone area that the initiating group is in contact with regarding participation in the management zone;

(iv.) Initial assessment of groundwater conditions based on readily available existing data and information.
- May use default information in or referenced by, the CV-SALTS SNMP (2016) or provide supplemental information that includes water quality conditions in the upper zone;

(v.) Identification/summary of current treatment and control efforts, or management practices;[14]

(vi.) Initial identification of public water supplies or domestic wells within the Management Zone area that exceed nitrate water quality objectives;

(vii.) An Early Action Plan to address drinking water needs for those that rely on public water supply or domestic wells that exceed nitrate water quality objectives;

(viii.) Documentation of process utilized to identify affected residents and the outreach utilized to ensure that they are given the opportunity to participate in development of an Early Action Plan;

(ix.) Identification of areas within or adjacent to the management zone that overlap with other management areas/activities;

(x.) Any constituents of concern that the individual discharger/group of dischargers intend to address besides nitrate (not required but is an option available);

(xi.) Proposed timeline for:
- Identifying additional participants;
- Further defining boundary areas;
- Developing proposed governance and funding structure for administration of the Management Zone;
- Additional evaluation of groundwater conditions across the management zone boundary area, if necessary; and,
- Preparing and submitting a Final Management Zone Proposal and a Management Zone Implementation Plan.

Preliminary Management Zone Proposals must be submitted to the Central Valley Water Board according to the due dates identified in Table 4-11.

Permittees that are identified as an Initial Participant in a Management Zone shall be presumed to be electing Path B for complying with the Nitrate Control Program, unless they otherwise notify the Central Valley Water Board of their intent to withdrawal from Path B. If a permittee

[14] If the discharger seeking compliance through this option is a third party submitting the NOI on behalf of the individual members of the third party, the third party will need to take reasonable efforts to summarize the management practices being used by its members with respect to protecting groundwater quality from the impacts of nitrates from member farming operations.

withdraws from Path B, the permittee must submit an initial assessment and Notice of Intent within 30 days from withdrawing from Path B.

Early Action Plan (Path A and Path B as applicable)

Early Action Plans are required if public water supply or domestic wells in the permittees area of contribution exceed nitrate water quality objectives. Implementation of an Early Action Plan that is addressing elevated nitrate concentrations for public water supply and/or domestic wells by providing an alternative water supply does not create a presumption of liability for the cause of such concentrations.

An Early Action Plan must include the following:

(i.) A process to identify affected residents and the outreach utilized to ensure that impacted groundwater users impacted by nitrate are informed of and given the opportunity to participate in the development of proposed solutions;

(ii.) A process for coordinating with others that are not dischargers to address drinking water issues, which must include consideration of coordinating with affected communities, domestic well users and their representatives, the State Water Board's Division of Drinking Water, Local Planning Departments, Local County Health Officials, Sustainable Groundwater Management Agencies and others as appropriate;

(iii.) Specific actions and a schedule of implementation that is as short as practicable to address the immediate drinking water needs of those initially identified within the management zone, or area of contribution for a Path A discharger, that are drinking groundwater that exceeds nitrate standards and that do not otherwise have interim replacement water that meets drinking water standards; and

(iv.) A funding mechanism for implementing the Early Action Plan, which may include seeking funding from Management Zone participants, and/or local, state and federal funds that are available for such purposes;

An Early Action Plan may be part of an Alternative Compliance Project.

Final Management Zone Proposal (Path B)

Management Zone participants must prepare and submit a Final Management Zone Proposal. The Final Management Zone Proposal must include all information from the Preliminary Management Zone Proposal, updated as necessary, as well as the following:

(i.) Timeline for development of the Management Zone Implementation Plan;

(ii.) Updated list of participants;

(iii.) Governance structure that, at a minimum, establishes the following: (a) roles and responsibilities of all participants; (b) identification of funding or cost–share agreements to implement short term nitrate management projects/activities, which may include local, state and federal funds that are available for such purposes; and (c) a mechanism to resolve disputes among participating dischargers;

(iv.) Additional evaluation of groundwater conditions across management zone area, if necessary;

(v.) Identification of proposed approach for regulatory compliance (i.e., use of assimilative capacity and/or seeking approval of an exception for meeting nitrate water quality objectives);

(vi.) Explanation of how the management zone intends to interact and/or coordinate with other similar efforts such as those underway pursuant to the SGMA; and,

(vii.) Documentation of actions taken to implement the Early Action Plan.

Final Management Zone Proposals shall be submitted to the Central Valley Water Board for review and Board comment according to the due dates identified in Table 4-11.

Management Zone Implementation Plan (Path B)

A Management Zone Implementation Plan is the equivalent of an Alternative Compliance Project. Management Zone Implementation Plans shall:

(i.) Identify how emergency, interim and permanent drinking water needs for those affected by nitrates in the Management Zone area are being addressed, and how a drinking water supply that meets drinking water standards will be available to all drinking water users within the Management Zone boundary, and the timeline and milestones necessary for addressing such drinking water needs;

(ii.) Show how the Management Zone plans to achieve balanced nitrate loadings within the management zone (to the extent reasonable, feasible and practicable);

(iii.) Include a plan for establishing a managed aquifer restoration program to restore nitrate levels to concentrations at or below the water quality objectives to the extent it is reasonable, feasible and practicable to do so;

(iv.) Document collaboration with the community and/or users benefitting from any proposed short/long-term activities to provide safe drinking water;

(v.) Identify funding or cost–share agreements, or a process for developing such funding or cost–share agreements, to implement intermediate and long-term nitrate management projects/activities, which may include identification of local, state and federal funds that are available for such purposes;

(vi.) Identify nitrate management activities within a Management Zone which may be prioritized based on factors identified in the Nitrate Control Program and the results of the characterization of nitrate conditions. Prioritization provides the basis for allocating resources with resources directed to the highest water quality priorities first;

(vii.) Include a water quality characterization and identification of nitrate management measures that contains:

- Characterization of nitrate conditions within the proposed management zone, which will be used as the basis for demonstrating how nitrate will be managed

within the management zone over short-term and long-term periods to meet the management goals established in the Nitrate Control Program.

- Short (≤ 20 years) and long-term (> 20 years) projects and/or planning activities that will be implemented within the Management Zone, and in particular within prioritized areas (if such areas are identified in the Implementation Plan) to make progress towards attaining each of the management goals identified by the Nitrate Control Program. Over time as water quality is managed in prioritized areas, updates to the plan may shift the priorities in the Management Zone.
- Milestones related to achieving balanced nitrate loadings and managed aquifer restoration.
- A short-term and long-term schedule for implementation of nitrate management activities with interim milestones.
- Identification of triggers for the implementation of alternative procedures or measures to be implemented if the interim milestones are not met.
- A water quality surveillance and monitoring program that is adequate to ensure that the plan when implemented is achieving the expected progress towards attainment of management goals. All or parts of the surveillance and monitoring program may be coordinated or be part of a valley–wide and/or regional groundwater monitoring, if appropriate.

(viii.) Identify the responsibilities of each regulated discharger, or groups of regulated dischargers participating in the management zone, to manage nitrate within the Zone.

(ix.) Include information necessary for obtaining an Exception as set forth in the Exceptions Policy, or information necessary for the Central Valley Water Board to grant use of assimilative capacity for Management Zones.

Management Zone Request for Allocation of Assimilative Capacity

A request for allocation of assimilative capacity for a Management Zone may not be for an area larger than an identified basin or sub-basin from Table 4-6, and must include the following:

(vii.) An analysis, sufficient for the Board to make findings consistent with the State Antidegradation Policy, which includes an evaluation of impacts to downgradient areas.

(viii.) Demonstration that there is sufficient assimilative capacity to ensure that discharges of nitrate from participants to the Management Zone, including discharges to recharge projects, will not cause the volume–weighted average water quality in the upper zone underlying the management zone to exceed the applicable Basin Plan objective(s);

(ix.) Demonstration that the proposed discharges covered by the management zone will not unreasonably affect present and anticipated beneficial uses in or downgradient to the Management Zone;

(x.) Demonstration that the allocation of assimilative capacity, and the resulting net effect on receiving water quality, is consistent with maximum benefit to the people of the State; and

(xi.) Demonstration that Best Practicable Treatment or Control will be implemented to ensure that pollution or nuisance will not occur and that any degradation authorized by the Central Valley Water Board will be consistent with the maximum benefit to the people of the state.

(xii.) Demonstration that allocation of assimilative capacity to dischargers participating in the Management Zone will not result in groundwater, as a volume–weighted average in the upper zone, to exceed a trigger level of 75% of the nitrate water quality objective over a 20-year timeframe. The Central Valley Water Board retains the discretion to allocate assimilative capacity above this trigger level as long as the Central Valley Water Board can find that use of assimilative capacity above the trigger level will not result in pollution or nuisance over the longer term.

Management Zone Request for Exception to Meeting a Nitrate Water Quality Objective

A Management Zone may request an Exception to meeting a Nitrate Water Quality Objective. The request for application of the Exception may apply to all permitted dischargers participating in the Management Zone. The Central Valley Water Board must find that all required components of the Management Zone Implementation Plan is complete to consider an Exception.

Modification to Management Zone Implementation Plan

A Management Zone Implementation Plan shall be reviewed periodically, and may be modified periodically to incorporate changes based on new data or information. Any such modifications should generally be changes that will benefit water quality in the management zone. Any modifications to the Management Zone Implementation Plan that impact or change timelines, milestones or deliverables identified in the Implementation Plan must be approved by the Central Valley Water Board.

Central Valley Water Board Actions

Individual Permitting Approach – Path A

The Central Valley Water Board will use the information contained in a submitted Initial Assessment/Notice of Intent or Report of Waste Discharge to determine if the discharge in question complies with the Nitrate Control Program. If the Board finds that the discharge as currently permitted is in compliance with the Nitrate Control Program, then revisions to existing waste discharge requirements or conditional waivers may not be necessary.

If the discharge as permitted, or proposed to be discharged, does not comply with the Nitrate Control Program, or if the Central Valley Water Board needs additional information to make such a determination, the Board may request additional information using its existing authorities.

Based on the categorization of the discharge, the Central Valley Water Board may require the permittee to conduct additional monitoring and/or implement an Alternative Compliance Project as part of permit conditions.

Upon receipt of a completed Initial Assessment/Notice of Intent or Report of Waste Discharge, the Central Valley Water Board shall take all reasonable efforts to revise applicable waste discharge requirements or conditional waivers within one year, as resources allow.

Implementation of an Early Action Plan shall begin as soon as is reasonably feasible, but no later than 60 days after submittal, unless the Central Valley Water Board deems the Early Action Plan to be incomplete. A revised Early Action Plan must be resubmitted and implemented within the time period directed by the Board's Executive Officer.

Management Zone Permitting Approach – Path B

Preliminary Management Zone Proposal

Upon receipt of a Preliminary Management Zone Proposal, the Central Valley Water Board shall prominently post the proposal on its website, circulate the Proposal publicly through its Lyris electronic mailing and provide individual post card notices (as resources allow) of the Proposal's availability to dischargers within the Management Zone boundary area that are not already identified as Initial Participants. The Board will work with the group of initiating dischargers to help communicate the availability of the Proposal to other dischargers and stakeholders within the Management Zone area. The Preliminary Management Zone Proposal shall be available for comment for at least 30 days after being posted on the Board's website. Any comments provided shall be considered in the development of the Final Management Zone Proposal.

Early Action Plan

The Central Valley Water Board shall post the Early Action Plans on its website after receipt. Implementation of the Early Action Plan shall begin as soon as is reasonably feasible, but no later than 60 days after submittal, unless the Board deems the Early Action Plan to be incomplete. A revised Early Action Plan must be resubmitted and implemented within the time period directed by the Board's Executive Officer.

Final Management Zone Proposal

Upon receipt of a Final Management Zone Proposal, the Central Valley Water Board shall prominently post the proposal on its website, circulate the Final Proposal publicly through its Lyris electronic mailing list, and make the Final Proposal available for public review and comment for at least 30 days. The Board's Executive Officer shall determine if the Final Management Zone Proposal meets the minimum requirements set forth under Path B and must determine if the Final Management Zone Proposal is deemed complete. A complete Final Management Zone Proposal functions as an equivalent to a Report of Waste Discharge for all existing permitted dischargers that are participating in the Management Zone.

Management Zone Implementation Plan

Within a reasonable time period, but no later than six months after finding the proposed Management Zone Implementation Plan is complete or finding that requests for modifications to an approved Management Zone Implementation Plan that would alter timelines, milestones or deliverables are complete, the Central Valley Water Board shall provide public notice, request comment and schedule and hold a public hearing on the Management Zone Implementation

Plan and the request for Alternative Compliance (i.e., volume weighted assimilative capacity or exception) embedded within the plan.

When the Central Valley Water Board finds it necessary to revise existing waste discharge requirements or conditional waivers, or issue new waste discharge requirements or conditional waivers, to implement the Management Zone Implementation Plan, the notice, request for comment and public hearing requirement may be conducted in conjunction with the Board's process for revising or adopting waste discharge requirements or conditional waivers.

The Central Valley Water Board may approve all or part of a request for use of assimilative capacity to a Management Zone using a volume–weighted average in the upper zone, if the Board finds all of the following:

(i.) The request is consistent with the State Antidegradation Policy;

(ii.) The request is supported with a antidegradation analysis;

(iii.) The request includes a Management Zone Implementation Plan that meets the requirements identified herein;

(iv.) Allocation of assimilative capacity to dischargers participating in the Management Zone will not adversely impact available assimilative capacity in areas outside of the Management Zone; and,

(v.) Allocation of assimilative capacity to dischargers participating in the Management Zone will not result in groundwater, as a volume–weighted average in the upper zone, to exceed a trigger level of 75% of the nitrate water quality objective for MUN over a 20-year timeframe. The Central Valley Water Board retains the discretion to allocate assimilative capacity above this trigger level as long as the Central Valley Water Board can find that use of assimilative capacity above the trigger level will not result in pollution or nuisance over the long term.

The Central Valley Water Board may grant an exception to meeting nitrate water quality objectives to existing permitted dischargers participating in the Management Zone, if the Board finds all of the following:

(iii) The request is consistent with the Exceptions Policy; and,

(iv) The request includes a Management Zone Implementation Plan that meets the requirements identified herein.

If a Management Zone Implementation Plan is found to not be complete, and if a Management Zone does not revise the Management Zone Implementation Plan in a timely manner that makes it complete for consideration by the Central Valley Water Board, then dischargers within that Management Zone must comply with the Nitrate Control Program via Path A as directed by the Board's Executive Officer.

Requirements for Alternative Compliance Projects

The Central Valley Water Board will require a discharger(s) to develop and implement an Alternative Compliance Project to support an allocation of assimilative capacity on a volume–weighted basis, above a trigger level, or to authorize an exception.

- For dischargers electing to comply under Path A, the Alternative Compliance Project must be submitted with the Initial Assessment/Notice of Intent.

- For dischargers electing to comply under Path B, the Alternative Compliance Project is the Management Zone Implementation Plan.

At a minimum, an Alternative Compliance Project must include the following:

(4) Identification of public water supply and domestic wells that contain nitrate concentrations above the water quality objective and that are within the discharge zone of contribution;

(5) A schedule, with identified milestones, for addressing those nitrate–related drinking water issues; and,

(6) Identification of steps to be taken to meet the management goals of the Salt and Nitrate Management Program, which may be phased in over time[40]

The Central Valley Water Board has developed *Guidelines for Developing Alternative Compliance Projects*, which dischargers should consider in development of an Alternative Compliance Project.

[40] The Central Valley Water Board recognizes that full compliance with management goals 2 and 3 (i.e., reaching balance and managed restoration) may not be reasonable, feasible or practicable in all circumstances. In such cases, the discharger is responsible for providing the Central Valley Water Board with all necessary information to show why full compliance with management goals 2 and 3 are not reasonable, feasible or practicable. Dischargers shall still implement actions towards meeting the management goals that are reasonable, feasible and practicable.

Guidelines for Proposing an Acceptable Alternative Compliance Project

When an individual or group of dischargers is unable to demonstrate that their discharge is not causing or contributing to nitrate degradation above the triggers identified in the Nitrate Control Program, they have an opportunity to request either allocation of available assimilative capacity or an exception. In most cases, the request for the granting of assimilative capacity above a trigger or an exception in these circumstances will trigger the need for submittal of a proposed Alternative Compliance Project. The Alternative Compliance Project Guidelines define the components that must be included in an alternative compliance project in order to be considered and approved by the Central Valley Water Board. The guidelines specify a number of requirements for a proposed Alternative Compliance Project, including: 1) be consistent with the management goals of the Nitrate Control Program; 2) prioritize assurance that drinking water that meets drinking water standards is available to all drinking water users within the zone of influence where there are significant nitrate water quality concerns in groundwater; 3) identify short-term and long-term projects or planning activities that will be implemented to make progress toward the Nitrate Control Program water quality management goals; and 4) include a short-term and long-term schedule for implementation of nitrate management activities.

Options:

a) Incorporate the Guidelines into the Basin Plans
b) Retain the Guidelines within the Staff Report

A request for Alternative Compliance (i.e. granting of assimilative capacity or an exception) must be accompanied by sufficient documentation to verify that the proposed approach is reasonable, feasible, and practicable and meets the goals of the Nitrate Control Program. To authorize Alternative Compliance, the Central Valley Water Board looks to see if the request is supported with an Alternative Compliance Project (ACP). An ACP may be proposed by an individual discharger (which includes a third party group subject to a general order) or dischargers working collaboratively as part of a management zone. Under Path B of the Nitrate Control Program, the preparation of a Management Zone Implementation Plan is considered the equivalent of an ACP. While the Board has the discretion to deny such a request, any proposed Alternative Compliance Project(s) should contain the following components in order to be considered.

(a) As needed: updates to Initial Assessments and Preliminary Management Zone Proposals that include:

- Anticipated area of contribution of the individual discharger (or third party group subject to a general order), or group of dischargers under a management zone, over a 20-year planning horizon;
- Stakeholders that may be affected within the area of contribution over a 20-year planning horizon;
- Identification of stakeholders within the area of contribution who are not included within the ACP boundaries and why;
- Identification of areas within the area of contribution that overlap with other management areas/activities and the process to ensure coordination;

- Identifications of geologic and hydrologic features that limit or promote groundwater movement.

- Further assessment of water quality conditions based on additional data and information.

- Process to identify affected residents and the outreach utilized to ensure that stakeholders are informed of and given the opportunity to participate in the development of any ACP proposal;

- Any constituents of concern the individual discharger/group of dischargers intends to address besides nitrate (not required but is an optional available); and

- Identification of current best efforts/Best Practicable Treatment and Control (BPTC) and need for assimilative capacity or an approved exception from meeting the nitrate water quality standard.

(b) Components of a Proposed Alternative Compliance Project(s)

- Be consistent with the management goals of the Nitrate Control Program, including addressing short– term and long-term drinking water needs affected by nitrates (Management Goal 1), plan for achieving balanced nitrate loadings within the proposed boundaries of the project, where reasonable and feasible (Management Goal 2), and a plan for establishing a managed aquifer restoration program to restore nitrate levels to concentrations at or below the water quality objectives to the extent reasonable, practicable and feasible (Management Goal 3).

- Include a process to ensure that drinking water that meets drinking water standards is available to all drinking water users utilizing groundwater within the area of contribution. This component may be met through the development and implementation of an Early Action Plan, as may be required by the SNMP Nitrate Permitting Strategy, payment into a mitigation fund, and/or other mechanisms geared toward providing emergency, interim and permanent solutions.

- Describe the outreach that has occurred and that will continue to occur to ensure that stakeholders or affected communities within the zone of influence are informed of, and given opportunity to participate in, the development of any ACP proposal as well as ongoing activities designed to resolve their drinking water concerns.

- For a management zone, contain a governance framework that, at a minimum, establishes the following: (a) roles and responsibilities of all participants; (b) involvement of an entity with authority to manage water use within the zone of influence including any identified SGMA[41] management agency, if applicable or as necessary; (c) involvement of representative(s) of stakeholders and/or communities within the zone of influence that utilize the groundwater as a drinking water supply; (d) funding or cost–share agreements to implement the ACP, and short-term and long-term nitrate management projects/activities; and (e) a mechanism to resolve

[41] California Department of Water Resources Groundwater Sustainability Agencies webpage: (https://www.water.ca.gov/Programs/Groundwater-Management/SGMA-Groundwater-Management/Groundwater-Sustainable-Agencies)

disputes among participating dischargers.

- Identify how nitrate conditions will be characterized for use as the basis for demonstrating how nitrate will be managed over short-term and long-term periods to meet the nitrate management goals established in the Central Valley Region SNMP.

- Identify short (≤ 20 years) and long-term (> 20 years) projects and/or planning activities that will be implemented as part of the ACP to make progress towards attaining each of the water quality– related management goals established by the Central Valley SNMP within the zone of influence. Projects/planning activities must first prioritize provision of safe drinking water but individual activities may be further prioritized to better allocate resources. Over time, as water quality improves in prioritized areas, updates to the ACP may shift the priorities.

- Identify mechanism(s) to support achievement of the overall Central Valley SNMP's long-term strategy to achieve balanced nitrate loadings and managed aquifer restoration, where reasonable and feasible. Mechanisms may include, but not be limited to:
  - Implementation of management practices that will reduce current nitrate loading to groundwater;
  - Use of offsets to help mitigate potential localized impacts, while improving overall basin or sub-basin–wide water quality (see Offsets Policy);
  - Managed groundwater recharge;
  - Pump and utilize and/or treat and distribute; and
  - Payment into a mitigation fund established to meet development and implementation of long term drinking water solutions, balance and restoration.

- Include a –schedule for short-term and long-term implementation of nitrate management activities with interim milestones and performance measures to assess progress every 5 years during the first 20-year planning horizon and every 10 years thereafter.

- Identification of alternative procedures or measures to be implemented if the interim milestones or performance measures are not met.
  - A water quality surveillance and monitoring program that is adequate to ensure that the ACP when implemented is achieving the expected progress towards attainment of water quality– related management goals (coordination with the SNMP's surveillance and monitoring program may be considered as part of efforts to comply with this element).
  - The ACP may be modified periodically to incorporate changes that will benefit water quality. Any modifications to an ACP that impact or change timelines, milestones or deliverables identified must be approved by the Central Valley Water Board through a public process.
  - The ACP shall identify the responsibilities of each regulated discharger, or groups of regulated dischargers if participating in a management zone, to manage nitrate within the zone. The Central Valley Water Board shall incorporate the responsibilities of each discharger, or groups of dischargers if within a management zone, into their respective

Individual or General WDRs.

- Prior to modifying any WDRs to incorporate the use of assimilative capacity on a management zone basis or adopting an exception to meeting a water quality standard for a discharger or dischargers participating in the management zone, Board staff will review the Management Zone Proposal and ACP to determine whether the Proposal and ACP meet all applicable criteria. Should the Board's review determine that the Management Zone Proposal and ACP meet all applicable criteria, the Executive Officer will issue a letter deeming the Proposal and ACP complete and will calendar the matter for the Board's consideration. The Board may then establish the management zone and its ACP after providing public notice and opportunity to comment consistent with laws and regulations applicable to the adoption or modification of WDRs. The triggers for determining the need for an ACP are identified in the Nitrate Permitting Strategy and based in part on the nitrate concentration in the effluent, the concentration in the receiving water, and the rate of degradation.
- Progress on the milestones and performance measures of the ACP must be provided to the Central Valley Water Board at a minimum of every five years during the first 20-year planning horizon and every 10-years thereafter.

4.2.2.1.3 Alternative 3: Nitrate Control Program that Clarifies Use of Current Central Valley Water Board Authorities

During stakeholder discussions, an alternative approach to the Nitrate Control Program that incorporates new authorities for the Central Valley Water Board was identified. This alternative primarily utilizes current authorities but provides some additional flexibility and clarifies findings that should be made prior to use of that flexibility. A brief summary of the differences between this Alternative 3 and Alternative 2 is presented in Table 4–13 as part of the evaluation of all Nitrate Control Program alternatives. Additional discussion is provided below.

Priority Basins: This alternative is consistent with Alternative 2 in the use of Priority 1 and Priority 2 basins as an approach to implementing a Nitrate Control Program.

Use of Categories and Triggers: The basin plan should not expressly recognize "de minimis" discharges of nitrate as a separate category due to the difficulty of predicting cumulative impacts and the potential of unintended consequences impacting water quality and beneficial uses. Rather, only three categories of discharges should be identified:

1. No degradation (based off of best water quality since 1968)

2. Degradation up to 7.5 mg/L nitrate as nitrogen (which would require additional monitoring and discharger must show they are implementing best efforts/BPTC); and

3. Pollution as defined as discharges that cause shallow groundwater quality to exceed 75% of the MCL (7.5 mg/L nitrate as nitrogen), where such an exceedance would require an exception and must also demonstrate implementation of best efforts/BPTC).

Use of Management Zones: Compliance with the Nitrate Control Program should be determined on a permit-by-permit basis. Management Zones would not be an available permitting option for compliance in order to determine available assimilative capacity or to develop permit limits.

Potential contamination as well as potential available assimilative capacity should be measured in the Shallow Zone by individual dischargers. Use of the shallow groundwater would be consistent with GeoTracker Gama when looking at monitoring wells and therefore would be consistent with existing information and tools.

All dischargers would be required to characterize their loading and impact of their loading on nitrate water quality in the immediate area of the discharge. This characterization would need to be conducted as part of a permit renewal application, or be ordered via section 13267 of the Water Code. In priority areas and upon notice by the Central Valley Water Board, individual dischargers should provide this information the Central Valley Water Board within 90 days. The Executive Officer shall have the discretion to extend the 90 days on a case–by–case basis due to special circumstances, but in no event should the extension be for more than an additional 90 days.

If a discharger cannot comply in the shallow groundwater, they must pursue exceptions and mitigation alternatives.

As part of the permit, dischargers shall also be required to assess their loading impact on the sub-basin area (as defined by DWR Bulletin 118). Dischargers will have the option to characterize loading and impact on the sub-basin through individual efforts or as part of a cooperative–type program. Management Zones may be appropriate to provided coordinated groundwater sampling within a sub-basin in order to determine trends in water quality.

Permittees selecting the individual pathway for assessing their loading impact would have one-year from permit adoption to conduct the sub-basin assessment, and permittees selecting to conduct the sub-basin assessment on a management zone/sub-basin basis in conjunction/cooperation with others would have one-year to develop the cooperative effort, and then one-year to conduct the assessment.

Compliance Pathway: Use of Assimilative Capacity or Use of An Exception: Based on the results of the individual characterization of loading as described above, permittees would then need to determine their compliance pathway (i.e., use of assimilative capacity in shallow groundwater or through granting of an exception).

Assimilative Capacity: could only be granted if the discharge (or collective discharges if the permit covered more than one permittee) would not cause or contribute shallow groundwater in a reasonably defined area to exceed 7.5 mg/L of N. Reasonably defined area means a local area and not on a sub-basin basis. As a condition of any allocation of assimilative capacity the permittee would need to participate in local, regional and/or statewide efforts that ensure safe drinking water where nitrate contamination is of issue for the area in question.

Exception: If assimilative capacity was not available under the terms specified above, the permittee would need to apply for an exception, and granting of an exception would be subject to the conditions in the Exceptions Policy options. In particular, any permittee(s) receiving an exception would need to be part of local, regional and/or statewide efforts that ensure safe drinking water where nitrate contamination is an issue for the area in question.

Exceptions may not interfere with efforts to achieve nitrate balance and restoration and may not contribute to localized areas of contamination. At a minimum, exceptions should not be granted where compliance is practicable, not be granted indefinitely, must be as short as practicable, and may be granted only for a maximum of 10-year increments of time. Regular check-ins are

required in order to provide opportunities to reassess whether the exception is still necessary. For example, new technology or practices may have been developed after the granting of the exception.

Exceptions may be granted renewals up to three times every 10 years so long as certain performance metrics are met at each renewal. The metrics must include, at a minimum: demonstration that short-term drinking water solutions were successfully implemented; demonstration that mitigation of groundwater contamination is in place; and a schedule to ensure long-term safe drinking water supplies and groundwater restoration.

However, it would only be permissible under very limited circumstances for the Central Valley Water Board to permit a discharger not to strictly comply with water quality objectives. In almost all cases a discharger should both be required to comply with water quality objectives and, to the extent they do not, mitigate the harm or complete an offset project related to noncompliance (see offset discussion below). A discharger may be eligible for an exception under specific circumstances related to the individual discharger and discharge at issue, if the discharger can demonstrate several things to ensure protection of groundwater, including but not limited to the following:

a) Water quality in the applicable groundwater location will be improved by limited noncompliance in conjunction with completion of a project;

b) The discharger cannot economically both comply with water quality objectives and complete the project;

c) The proposed project and the discharge are located closely together and hydrogeologically connected such that no localized impacts will occur;

d) Any permissive noncompliance must be time-limited for the shortest practicable time;

e) After the expiration of a time schedule, permissive noncompliance must stop;

f) A plan must be in place to achieve compliance per the time schedule;

g) Potentially impacted domestic wells must be monitored to prevent impacts to drinking water; and

h) Any permitted discharge must be consistent with Porter–Cologne and the State Antidegradation Policy.

The terms “reasonable” and “feasible” need to be subject to certain criteria in order to provide the Central Valley Water Board sufficient guidance when considering such projects. One factor that should be included is the economic cost to nearby communities, in particular disadvantaged communities (DACs). Hypothetically, while in certain circumstances it may appear that requiring a discharger to complete a specific project or greatly change their practices may not seem “reasonable”, once the cost to the discharger is compared to the impact on drinking water supplies, the calculation will likely change. A second factor is consideration of whether failure to act now will result in much higher costs. A third and related factor is consideration of how a “reasonable and feasible” determination impacts restoration goals, including interim milestones.

Offsets: An Offset Project may only be used to offset a specific discharge so that the net discharge (taking into account both the discharge and the offset project) complies with the water quality objectives in the applicable shallow groundwater. Offsets must occur within an area of the basin that is hydrogeologically connected to the water impacted by a discharge, such that water quality in the locality of the discharge is not affected. The hydrogeological connection must be close enough to ensure that sufficient groundwater mixing will occur and that there will not be disproportionate impacts. Absent this hydrological connection and geographic proximity, there is potential for one area of the basin to benefit at the detriment of another portion due to the fact that flow of groundwater does not typically promote mixing and any mixing that does occur can be over very long time periods. Nitrate plumes may form and impact local users. Offsets should only be used in localized areas to move toward balance and restoration.

Phasing of Implementation Activities to Meet Prioritized Management Goals: "Projects" are required in order to allow use of assimilative capacity or an exception. Under Alternative 2, "Alternative Compliance Projects" have three distinct phases (short/long term provision of safe drinking water supplies; bringing basin into balance; restoration where reasonable, feasible and practicable). Under this Alternative 3, the three distinct phases are recognized, but are recommended to occur concurrently and overlap. Some level of phasing in of activities may be appropriate in the very short term. However, every permit, including exceptions, should require steps toward restoration. One of the primary goals of the Basin Plans is restoration, thus, it should remain at the forefront of Basin Plan Objectives, goals, metrics, and timelines. Phase I would involve provision of safe drinking water to impacted users and should also require, at a minimum, concrete steps toward balance and a pilot program or demonstration project for restoration of groundwater.

Each step must have some level of overlap: providing safe drinking water, achieving nitrate balance, and restoration of the basin. Each step also aids the others. Reaching balance quickly will reduce the cost of restoration. Similarly, restoration will lessen the financial burden on providing safe drinking water by removing the necessity for filters treatment, and/or increased monitoring costs.

Restorations within 50 years must be prioritized to relieve communities of harm experienced by nitrate contamination. Any extension in timeline (50, 100 or 200 years) must include solid justification for any chosen alternative, including the cost–benefit to both communities and dischargers. Restoration efforts must be tied to SGMA activities which require GSAs to reach sustainability by 2040/2042 depending on their overdraft status.

4.2.2.2 Evaluation of Nitrate Control Program Alternatives

The three alternatives identified, No Action, Nitrate Control Program with New Authorities and Nitrate Control Program Clarifying Existing Authorities, were evaluated against the criteria identified through the stakeholder effort and discussed in Section 4.1. The evaluation is summarized in Table 4–12.

In addition, to help clarify the differences between Alternative 2 which provides new regulatory authority with Alternative 3 which primarily clarifies existing authority, key differences between proposed elements of each are summarized in Table 4–13.

Table 4 - 12. Evaluation of Nitrate Control Program Alternatives

Criteria	Alternatives		
	No Action	New Authorities	Clarify Existing Authorities
Provide Alternate Drinking Water Supplies	L/M	M/H	L/M
Legally Authorize Ag Discharges	M	H	L/M
Prevent Further Degradation	M	M	M
Restore Degraded Groundwater	L	M/H	L/M
Apply to Diverse Conditions	M	H	M
Leverage and Maximize Resources	L	H	L

Notes:
L = Low or Limited
M = Medium ability to address or addressed in some cases or over time
H = High likelihood of being addressed

Table 4 - 13. Comparison Nitrate Control Program Alternatives 2 and 3

Alternative 2––New Authorities	Alternative 3—Clarify Existing Authorities
Water Quality Objective remains at 10 mg/L to determine assimilative capacity. Trigger of 7.5 mg/L utilized to increase management efforts and determine "available" assimilative capacity.	Any discharge causing an "exceedance" above 7.5 mg/L is causing pollution and needs an exception. (Functionally changing water quality objective to 7.5 mg/L)
Two paths for compliance: single permitted discharger OR sub-basin Management Zones	Compliance to be determined on a permit-by-permit basis. Management zone compliance is not an option.
Single dischargers fall into one of five categories depending quality of shallow GW and discharge: no impact; *de minimis* impact; degradation below trigger; degradation above trigger; discharges to impacted groundwater.	Three categories: 1) no degradation (baseline 1968); 2) degradation up to 7.5 mg/L; 3) Pollution if above 7.5 mg/L needing an exception. No recognized *de minimis* impact
Management Zones can be proposed to manage nitrate on a sub-basin basis scale. Authorization of available assimilative capacity as measured in the Upper Zone is a means of compliance.	Management Zones not an option except for use in monitoring water quality trends. All compliance measured in shallow GW. Where dischargers cannot comply in shallow GW, must pursue exceptions and mitigation alternatives.
Allocation of assimilative capacity or approval of exception requires implementation of BPTC/Best Efforts as well as discharger proposed Alternate Compliance Projects (ACP). ACP must contain three phased elements: short/long term provision of safe drinking water supplies; bringing basin into balance; restoration where reasonable and feasible. Exceptions may be granted up to 50 yrs. with reviews every 10 yrs. Extension possible with measurable, continuing water quality improvements.	Limited to no phasing of efforts. Propose early actions for ensuring safe drinking water supplies and concurrent mitigation to restore all ground water basins. Allows initial short term focus on drinking water supplies if justified economic hardship to do more. Exceptions should not be granted if it is practicable for discharger to comply. Allowed up to three 10–yr. renewals if performance metrics met.
Offsets can include directly providing safe drinking water to those impacted, moving toward balance within a sub-basin, and moving toward restoration in a sub-basin.	Offsets do not equal mitigation and should only be used in localized areas to move toward balance and restoration

Alternative 2––New Authorities	Alternative 3—Clarify Existing Authorities
Proposed Implementation Plan must include measurable milestones; but is silent on end date for restoration	Propose all GW basins restored within 50-years

Provide Alternate Water Supplies: Current enforcement authority allows the Central Valley Water Board to require a discharger to provide or pay for uninterrupted replacement water to affected public water suppliers or private well owners if a permitted discharge violates permit terms or otherwise causes pollution. (Wat. Code, § 13304.) All alternatives rely on this authority. The No Action and Alternative 3 also rely on the authority provided by Water Code section 13267 orders for individual permittees to assess the impact of their discharge and then revisions of individual permits to require mitigation for impacted drinking water users. Alternative 2 retains current authority and processes but provides alternative compliance under a parallel pathway whereby permittees may elect to address replacement water through a permit action rather than an enforcement action due to other incentives associated with the alternative pathway. Alternative 2 allows dischargers to collaborate both on evaluation of potential impacted groundwater users and work with those users within a hydrologically connected sub-basin to find short-term and long-term solutions to nitrate impacts to drinking water.

Depending on the individual permittee, time will be required to update individual permits and resources may or may not be immediately available to the permittee to identify zone of discharge contribution and provide safe short-term replacement drinking water. Long-term solutions may require use of a mitigation fund. Replacement drinking water supplies will be provided under both the No Action Alternative and under Alternative 3. However, coverage may be limited depending on the permittees' ability to address impacted users considering other demands imposed on permittees by the program.

Alternative 2 allows for permittees within a Management Zone to pool resources to identify impacted groundwater users and provide short-term and long-term safe drinking water supplies. Pooling resources within a specified boundary should reduce time to initiate short term safe drinking water supply since there will not be individual studies by permittees to determine their zone of contribution prior to determining impacted users. All impacted users within the Management Zone boundaries must be provided safe drinking water supplies – both short-term and long-term. Pooling resources will also provide an advantage to either directly provide or negotiate for long-term safe drinking water supply projects. Use of a mitigation fund is not precluded under this option.

In general, while all Alternatives can move toward the provision of safe drinking water supplies, Alternative 2 has the potential to provide the greatest coverage within the shortest time period. Alternative 2 will likely result in the more immediate provision of replacement drinking water because permittees using alternative compliance under Alternative 2 will have greater flexibility to deploy resources to provide drinking water due to potentially longer compliance schedules (i.e., these permittees would not be laboring under a goal to restore aquifers in 50 years) and because they would have a greater ability to pool resources under the Management Zone option.

Legally Authorize Agricultural Discharges: The current regulatory framework allows agricultural discharges as long as appropriate antidegradation findings can be made and as long as the agricultural discharger can meet applicable water quality objectives in "first-encountered groundwater." However, in many areas of the Central Valley, groundwater already exceeds the

MCL to protect drinking water (10 mg/L nitrate as nitrogen). In these areas, discharges to the groundwater above 10 mg/L nitrate as nitrogen would be prohibited under existing State Water Board precedent. As irrigation water passes through the crop root zone, some uptake of nitrate is expected. Current regulatory activities under the Irrigated Lands Regulatory Program requires nutrient management plans to provide source control and maintain the nitrate level moving below the root zone to below 10 mg/L nitrate as nitrogen. Effectiveness of the nutrient management plans will vary by locations, crop type and management practices. It is anticipated that the nutrient management plans will be adaptive to new findings and will take time to maximize source control in all areas of the Central Valley.

Prevent Further Degradation: As discussed above, current regulatory framework is focused on source control and requires appropriate antidegradation findings to allow discharges of nitrate. Use of nutrient management plans in agriculture will minimize degradation from fertilizers. For other discharge categories such as wastewater treatment plants, industry, dairies, and/or food processors, additional treatment and/or disposal of waste water in lined ponds may be the only practicable means for source control. Activities are occurring now to reduce loading of nitrate. However, studies conducted by the University of California and others identified an existing, legacy source of nitrate in the vadose zone. As water moved down through the vadose zone it is adding legacy nitrate load to the groundwater aquifer. Due to the extensive time required for current activities on source control to be reflected in the groundwater aquifer, success of any of the three alternatives will vary by location, discharge source and historical land use practices. In addition, if a receiving water body already exceeds applicable water quality objectives, further degradation is prohibited and discharges must be at concentrations at or below the applicable objective. All proposed alternatives retain existing regulatory authority. Alternative 2 provides a clear framework that prioritizes activities to provide safe drinking water supplies while maintaining Best Efforts/BPTC. The approach would provide additional authority to allow controlled degradation during the short-term to allow a more rapid response to immediate user concerns while a longer-term nitrate management strategy is developed. The No Action Alternative and Alternative 3 do not have a clear prioritization framework. Alternative 3 requires portions of all phases (safe drinking water supplies, balance loading, and restoration) to overlap. Such an approach could lead to more rapid source control, if the individual permittees had the ability to sustain the financial burden of simultaneously addressing all phases of the control program from the initiation of the program through its conclusion.

Restore Degraded Groundwater: The current regulatory framework is focused on source control and does not have a framework for restoring groundwater basins on the scale needed for the Central Valley. Authority is currently limited to cleanup orders on an order-by-order basis. Alternative 3 continues the permit-by-permit approach but expands compliance to contributions to a mitigation fund for larger scale projects. Depending on the bounds of the mitigation funds (e.g. whether funding provided by a permittee within a select sub-basin must be earmarked for projects within that sub-basin, the result may or may not improve conditions for groundwater users directly affected by the permittees discharge. Alternative 2 retains cleanup authority and includes an option for the use of a mitigation fund, but also requires, under the Management Zone pathway, a specific plan with milestones to provide long-term, managed restoration where reasonable, feasible and practicable. The No Action alternative continues current practices of cleanup on a permit-by-permit basis, which has proven utterly ineffective for addressing the magnitude of the current nitrate impacts to Central Valley's groundwater. Alternative 3 provides more clarity on the specific restoration requirements and minimum timelines in order for a permittee to be granted assimilative capacity or an exception and allows the use of a mitigation fund to coordinate resources, but, based on work done under the Aggressive Restoration Study

(Luhdorff & Scalmanini and Larry Walker Associates, 2016b), such timelines cannot be universally met. Alternative 2 does not set specific timeline for final restoration to a concentration below the MCL, but does require specific milestones and review periods and pre–determined alternatives if milestones are not being met. Alternative 2 sets restoration as a lower priority than ensuring safe drinking water supplies and continuing source control efforts to balance nitrate loading, so restoration will take longer than assumed in Alternative 3. However, the Management Zone approach and requirements to closely coordinate with all stakeholders within the Management Zone to develop acceptable local solutions may have a greater likelihood to succeed in the long-term than projects instigated by a third party mitigation bank.

Apply to Diverse Conditions: The No Action Alternative and Alternative 3 utilize the current regulatory framework's flexibility to adjust to local conditions. The current framework does not prioritize implementation activities nor allow for the anticipated timelines needed to reach restoration on a large scale. Alternative 2 allows permittees to continue to be regulated as individual permit holders, but sets up prioritization for implementation activities and allows for the development of local solutions as long as those solutions have been developed in an open process and with input from all stakeholders potentially impacted by the final decision. Alternative 2 allows the stakeholders within the sub-basin under consideration to prioritize their own implementation activities dependent on the needs and diversity within their area.

Leverage and Maximize Resources: The No Action alternative and Alternative 3 operate permit-by-permit. Alternative 3 recommends use of a Mitigation Bank to focus resources, but both options anticipate overlapping concurrent activities related to ensuring safe drinking water supply, balancing nitrate loading and restoration of groundwater basins. Since the regulation is permit-by-permit, there is little ability for further prioritization of activities within sub-basins except at the mitigation bank level for restoration activities. Alternative 2 provides an option for permittees to collaborate through a Management Zone to systematically focus resources first on human health concerns, while continuing source control activities to minimize and/or eliminate further degradation and moving toward restoration in areas the Management Zone determines is reasonable, feasible and practicable. Any decision not to restore a specific sub-basin to meeting water quality objectives to protect MUN would require adoption of a Basin Plan Amendment to remove the MUN use through a rigorous public hearing process.

Additional Evaluation of Alternatives 2 and 3: Table 4–13 compares some of the distinct differences between Alternatives 2 and 3. Some of the differences between alternatives have been discussed above: whether or not to utilize Management Zones for compliance; limited phasing of management goals; and timeline to restore all groundwater basins within 50-years. A few other distinct differences are noted below.

- Determining an "exceedance": Alternative 3 recommends that the proposed trigger value of 7.5 mg/L nitrate as nitrogen be utilized to determine a level of pollution and need for an exception, based on the rationale that establishing a compliance metric below the standard establishes a margin of safety. Utilizing the trigger in this manner functionally changes the water quality objective from 10 mg/L to 7.5 mg/L nitrate as nitrogen. No scientific studies have been conducted to support such a change. It is appropriate to continue to utilize the 7.5 mg/L value as a trigger to require additional scrutiny on the discharge and any projects proposed to support allocation of assimilative capacity. The Board should retain discretion to determine whether or not to allocate the remaining assimilative capacity.

- Three vs. Five Categories of Discharges: Alternative 3 proposes three categories of discharges: no degradation using a baseline water quality of 1968 and then utilizing 7.5 mg/L nitrate as nitrogen as the boundary between available assimilative capacity and requirement of an exception. Alternative 3 does not support the use of a de minimis category and requires development of a project to support safe drinking water supplies for any use of assimilative capacity over a 1968 baseline nitrate concentration. Based on the variable nitrate groundwater quality throughout the Central Valley, including areas where nitrate concentrations were exceeding 10 mg/L in 1968, the three category approach may not meet the desired intent in all situation. In addition, there are many areas in the northern Central Valley where groundwater nitrate concentrations are well below the 7.5 mg/L triggers and continuing discharges since 1968 have not shown evidence that the trigger will be approached in the foreseeable future (Larry Walker Associates, 2013). In these situations, it is appropriate to set criteria that recognizes negligible impacts from a nitrate discharge so that primary regulatory focus can be on discharges that are or have the potential to impact drinking water supplies. The current criteria are for discharges that utilize less than 10% of the available assimilative capacity in the Shallow groundwater that would be within the discharge's zone of contribution and that over a 20-year horizon, the nitrate trigger would not be exceeded in that shallow zone. Discussion on the use of 7.5 mg/L nitrate as nitrogen to determine pollution is discussed in the paragraph above related to use of exceedances.

- Maximum Term for Exceptions: Alternative 2 primarily restricts the term of an exception to 50-years with reviews every 10-years. The 50-year term may be extended if measurable and continuing water quality improvements are being demonstrated through the implementation activities. Alternative 3 provides for 10-year terms that can be renewed three times if performance metrics are met. Given the amount of time documented through the Nitrate Implementation Measures Study (CDM Smith, 2016a) and the Aggressive Restoration Study (Luhdorff & Scalmanini and Larry Walker Associates, 2016b), a 30-year term was not adequate to restore nitrate concentrations to 10 mg/L in a 200–square mile area in the southern Central Valley. Although groundwater quality was improving, portions of the aquifer still exceeded 10 mg/L nitrate as nitrogen after 100 years. Alternative 2 provides a more realistic timeline and allows for continued long-term restoration activities if measurable improvements can continue to be documented.

- Offsets: The options for Offsets will be discussed in Section 4.2.9 as part of the Offsets Policy component of the overall Salt and Nitrate Control Program. It should be noted here that use of offsets as an alternative compliance project for nitrate is not anticipated on a broad scale.

4.2.2.3 Recommendation

Incorporate Alternative 2: Nitrate Control Program with Additional Authorities, adjusted to include additional guidance on development of Alternative Compliance Projects and considerations related to "reasonable, feasible and practicable" as well as clarify the review period.

When balanced against the expanse of groundwater basins with nitrate concentrations already exceeding concentrations to protect drinking water supplies, the limitations in available public resources to identify domestic well users impacted by nitrate and to provide immediate safe water supplies to those users, and the documented time needed to restore nitrate contaminated

groundwater basins, Alternative 2 provides the most flexibility to meet the three goals of the program while clearly prioritizing human health concerns in the short term. All three alternatives meet evaluation criteria to some level, however Alternative 2 has the best potential to leverage and maximize resources for the benefit of stakeholders within sub-basins (Management Zones) and direct resources immediately toward alleviating human health concerns while continuing source control efforts and moving forward with long-term managed restoration.

Alternative 2 identified the need to have minimum criteria that apply both to evaluation of projects proposed to support allocation of assimilative capacity and granting of exceptions (Alternative Compliance Projects under Alternative 2). It is recommended that the Guidelines for Alternative Compliance Projects be expanded to include the following criteria from Alternative 3 which were not specifically identified in the original guidelines:

- Coordination with stakeholders and tracking of drinking water quality in areas that will be part of the zone of contribution over a 20-year planning horizon; and
- Regular reviews to evaluate development of short and long-term safe drinking water projects as well as progress toward restoration (proposal recommends every 5-years for the first 20-years and every 10-years thereafter).

It is also recommended that the guidelines for alternative compliance projects remain in the Staff Report rather than be incorporated into the Basin Plans in order to allow adaptive adjustment as the control program moves forward.

The proposed Nitrate Control Program will not remove any of the existing authorities of the Central Valley Water Board, but will allow additional authority so that permittees may leverage their resources to develop a long-term nitrate management strategy that will prioritize provision of safe drinking water supplies while accounting for diversity within the valley, limiting degradation, and allowing agricultural discharges to continue. Staff recommends that the progress of the Nitrate Control Program be reviewed consistent with the schedule for the Salt Control Program—after each 10 to 15 year phase.

4.2.3 Mechanism to Ensure Early Participation and Implementation

The Salt and Nitrate Control Program will primarily be implemented through Waste Discharge Requirements and waivers. There currently exist over 1,400 permitted discharges within the Central Valley. While it is appropriate for permit and waiver conditions to contain provisions for the Salt and Nitrate Control Program, there are several potential approaches to amending permit requirements. Some options have the potential to delay the primary goal of identifying groundwater users impacted by elevated nitrate concentrations and providing safe drinking water supplies in priority basins.

In addition, the proposed approach to the Salt Control Program requires that all permitted discharges of salt determine their compliance pathway within six months of receiving a Notice to Comply with provisions of the Salt Control Program in order to provide the financial base for the needed salinity Prioritization and Optimization Study (P&O Study). The P&O Study is anticipated to cost $10 million and take ten years, so any delays would also delay projects to move from managed degradation to balanced loading and protection of salt sensitive areas.

4.2.3.1 Alternatives

The following five alternatives were identified.

1) General Amendment to Existing WDRs: Board would amend all existing permits in one

single permitting action. (Action would be a General WDR Amendment with an attachment that would describe all of the WDRs that the amendment would apply to.) General Amendment would replace existing salt and nitrate requirements with new provisions. New salinity provisions would require dischargers to either comply with strict salinity limits or start participating in the P&O Study. New nitrate provisions would require dischargers to either comply with strict nitrate limits or implement early actions.

2) Global Time Schedule Order: Board would issue a Time Schedule Order (TSO) that would cover every permittee. TSO would provide a time schedule that would set interim compliance requirements in lieu of compliance with existing permit limits. Interim compliance requirements would require participation in early phases of P&O study and/or implementation of early actions to address nitrate

3) Conditional Prohibition: The Basin Plan Amendments would establish conditional prohibitions for salt and nitrate discharges. Upon receipt of a "Notice to Comply", the prohibitions would prohibit any discharges of salt or nitrates unless the discharge was consistent with the implementation provisions in the proposed Basin Plan Amendments. The salinity implementation provisions would require dischargers to either comply with strict salinity limits or start participating in the P&O Study. The nitrate implementation provisions would require dischargers to either comply with strict nitrate limit or implement early actions.

4) Hybrid Approach: Revise ILRP General Orders (and perhaps others) and establish conditional prohibition for all other permittees: ILRP

5) "Elective" General Order that could Replace Nitrate/Salinity Terms in Existing WDRs: The Board would adopt a General Order that would replace WDR provisions relating to salt and nitrate for any discharger that chose to enroll in the General Order. After adopting the General Order, the Board would mail out 13260 notices to all dischargers – the notices would tell the dischargers that they would either need to sign up for the General Order or submit a ROWD to the Board to have their WDRs amended to incorporate strict salt and nitrate limits.

4.2.3.2 Evaluation

During the review of each alternative, it became clear that the more each permit had to be individually evaluated and the greater the number of permits that needed to be modified, the more extended the delay prior to initiating any of the time-sensitive activities identified in the Salt and Nitrate Control Program. Alternatives 1 and 2, in particular, would require the Board to review and potentially modify each individual Board-issued permit. Alternative 1 would require a review of each type of salt and nitrate provision included in the existing permits and potentially require revisions of antidegradation provisions, in-permit time schedules, and other findings related to salt and nitrate limitations.

Under Alternative 2, a provision within each WDR would need to be identified as being violated in order for the Board to have authority to issue a Time Schedule Order (TSO). A Global TSO would need to identify which provision the TSO is addressing for each permit included. For permits currently meeting more flexible salt and nitrate requirements, the permit itself would need to be revised. A discharger under a TSO might be required to disclose that they are subject to "enforcement" on financial disclosures, which may limit their ability to qualify for loans.

Use of an "Elective" General Order under Alternative 5 has potential to be less time intensive than Alternatives 1 and 2 if permittees are fully responsive after receiving a notification and opt to sign up under the General Order. Delays could occur if response is inconsistent and extensive tracking of status of individual permittee is needed. If multiple permittees do not opt to comply under the General Order, a larger number of individual orders would need to be individually evaluated and updated.

A Conditional Prohibition on salt and nitrate discharges under Alternative 3 provides the most immediate and directly-enforceable approach to ensure early participation and implementation as permits are being methodically updated to include provisions of the Salt and Nitrate Control Program. Once the Salt and Nitrate Program is in effect, as well as its accompanying Conditional Prohibition of Discharge, any discharges of salt or nitrate would be prohibited unless the discharge was consistent with the implementation provisions in the proposed Basin Plan Amendments. Tracking participation may be difficult, but individual permits would not need to be modified before early implementation measures could be required by the Board (e.g. participation in the P&O Study or meeting conservative limits for salt and/or developing Early Action Plans to provide safe drinking water supplies to groundwater user impacted by elevated nitrate levels).

Alternative 4 is a hybrid approach whereby Irrigated Land Regulatory Program (ILRP) General Orders are amended to include Salt and Nitrate Control Program provisions (and perhaps other General Orders as well) to have enforceable permit limits over large numbers of dischargers. The Conditional Prohibition would continue to apply to any permittee discharging salt or nitrate until such time that their permit is updated to include Salt and Nitrate Control Program provisions. This option would allow the Board to gain the benefits of the conditional prohibition, while also considering the unique nature of the coalition-based ILRP General Orders.

4.2.3.3 Recommendation

Alternative 4 is recommended. The hybrid approach that combines a conditional prohibition with amending General Orders provides a logical framework to ensure early participation and implementation of key Salt and Nitrate Control Program activities. Although only Irrigated Land Regulatory Program (ILRP) General Orders are specifically called out for revision within 18 months of the effective date of the Basin Plan Amendments, by limiting the application of the Conditional Prohibition to such time that existing waste discharge requirements or conditional waivers are updated to reflect program requirements, nothing in the Conditional Prohibition prevents additional General Orders (i.e. the Dairy Order) from being updated prior to issuance of a Notice to Comply except staffing limitations.

Staff recommends that a Conditional Prohibition for salt discharges and a separate Conditional Prohibition of Nitrate discharges to groundwater be incorporated into the Basin Plans and contain the following elements.

Conditional Prohibition on Salt Discharges

- The Conditional Prohibition on Salt Discharges shall apply during Phase I of the Salt Control Program.

- The Conditional Prohibition will apply to all permittees discharging salt pursuant to Board–issued waste discharge requirements and conditional waivers, except those covered under the dischargers regulated under the Board's Irrigated Lands Regulatory Program (ILRP).
    - The Central Valley Central Valley Water Board will consider amendments to

ILRP General Orders to incorporate provisions of the Salt Control Program within 18 months of the effective date of the Basin Plan Amendment.

- For permittees subject to the Conditional Prohibition, the prohibition shall apply from the time that a permittee receives a Notice to Comply until such time that the permittees' existing waste discharge requirements or conditional waivers are updated to reflect requirements of Phase I of the Salt Control Program

- Upon receiving a Notice to Comply, discharges of salts at concentrations that exceed salinity numeric values identified in the Phase 1 Conservative Permitting Approach are prohibited unless the permittee is implementing the Phase I requirements

- The Conditional Prohibition on Salt Discharges shall sunset at the end of Phase I of the Salt Control Program.

Conditional Prohibition of Nitrate Discharges to Groundwater

- The Conditional Prohibition will apply to all permittees discharging nitrates pursuant to Board–issued waste discharge requirements and conditional waivers, except those covered under the dischargers regulated under the Board's Irrigated Lands Regulatory Program (ILRP).
    - The Central Valley Central Valley Water Board will consider amendments to ILRP General Orders to incorporate provisions of the Nitrate Control Program within 18 months of the effective date of the Basin Plan Amendment.

- For permittees subject to the Conditional Prohibition, the prohibition shall apply from the time that a permittee receives a Notice to Comply until such time that the permittees' existing waste discharge requirements or conditional waivers are updated to reflect requirements of the Nitrate Control Program.

- Upon receiving a Notice to Comply, discharges of nitrate are prohibited unless a discharger is implementing the requirements of the Nitrate Control Program.

4.2.4 Surveillance and Monitoring Program Requirements for the Salt and Nitrate Control Program

The Central Valley Water Board is required to include a monitoring and surveillance program when establishing an implementation program in the Basin Plans: "*The implementation program shall include, but not be limited to: …3. A description of surveillance to be undertaken to determine compliance with the objectives (Wat. Code, § 13242)*."[42] In addition, the Recycled Water Policy contains the following monitoring requirements for any developed Salt and Nutrient Management Plan:

- *Section 6.b(3)(a) – A basin/sub-basin wide monitoring plan that includes an appropriate network of monitoring locations – adequate to provide a reasonable, cost–effective means of determining whether the concentrations of salt, nutrients, and other constituents of concern are consistent with applicable water quality objectives. Salts, nutrients, and other constituents of concern shall be monitored as follows:*

[42] SRSJR Basin Plan, p. IV–1.00; the TLB Basin Plan includes similar language on p. IV–1.

- *(i) The monitoring plan must be designed to determine water quality in the basin, and must focus on basin water quality near water supply wells and areas proximate to large water recycling projects, particularly groundwater recharge projects. Also, monitoring locations shall, where appropriate, target groundwater and surface waters where groundwater has connectivity with adjacent surface waters.*
- *(ii) The preferred approach to monitoring plan development is to collect samples from existing wells if feasible as long as the existing wells are located appropriately to determine water quality throughout the most critical areas of the basin.*
- *(iii) The monitoring plan shall identify those stakeholders responsible for conducting, compiling, and reporting the monitoring data. The data shall be reported to the Central Valley Water Board at least every three years.*

The proposed Salt and Nitrate Control Program covers the entire Central Valley and has been phased for Salt Control and prioritized for Nitrate Control. The Salt and Nitrate Control Program is recognized as a long-term management effort that has both region-wide as well as localized components. As such, the surveillance and monitoring program will need to capture both region-wide trends in surface and groundwater quality as well as impacts of specific management activities.

4.2.4.1 Alternatives

Two alternatives were identified as follows:

1. No Action Alternative
2. Build off of Existing Monitoring Programs Utilizing Guidance Developed through the CV-SALTS Initiative

4.2.4.1.1 No Action

The No Action Alternative utilizes monitoring requirements currently established within the Basin Plans to provide information to satisfy the requirements identified above. The current requirements are program specific and range from individual permit requirements to track and regulate impacts from discrete discharges, to broader requirements under General Orders that allow the use of representative monitoring programs to provide program specific information on a region-wide basis. Two programs that fall under a representative monitoring framework include the Dairy Program and Irrigated Lands Regulatory Program. Required analysis varies depending on the program needs. For salt and nitrate, monitoring may be continuous (effluent and receiving water sensors for electrical conductivity for surface water discharges), non–existent if no reasonable potential to impact water quality was determined based on conditions when the permit was developed, or scheduled daily, weekly, seasonally, annually or other depending on the needs of the program. Data collected under each program may be compiled and stored in separate data base systems or in some cases paper copies are stored in house with pdf versions of analytical reports attached to electronic files within a broad data base system tracking compliance. Major data bases utilized by the various programs include:

- California Integrated Water Quality System (CIWQS): Utilized by the State and Regional Water Boards to track information about places of environmental interest, manage permits and other orders, track inspections, and manage violations and enforcement activities. CIWQS also allows online submittal of information by Permittees within certain programs and makes data available to the public through reports.

- GeoTracker GAMA (Groundwater Ambient Monitoring and Assessment Program):

Integrates and displays water quality data from various groundwater sources on an interactive Google–based map. Analytical tools and reporting features help users assess groundwater quality and identify potential groundwater issues in California. This data set is comprised of the Domestic Well and Priority Basin Project. The Domestic Well Project sampled domestic wells for commonly detected chemicals to evaluate the quality of groundwater. The Priority Basin Project provides a comprehensive assessment of statewide groundwater quality that helps identify and understand the risks to California's groundwater resources. Each data set is identified by "DW" for domestic well and "PB" for priority basin.

- California Environmental Data Exchange Network (CEDEN): Central location to find and share information about California's water bodies, including streams, lakes, rivers, and the coastal ocean. Many groups in California monitor water quality, aquatic habitat, and wildlife health. CEDEN aggregates this data and makes it accessible to environmental managers and the public.

The Basin Plans recognize the need to move toward more coordinated evaluation of both internal monitoring information as well as that collected by outside agencies. In the recently adopted Basin Plan Amendment to develop a consistent and transparent process to evaluate appropriate designation and level of protection for MUN in agriculturally dominated water bodies (Resolution R5–2017–0088) the following language was adopted as part of the monitoring and surveillance for the implementation component:

> *"As resources permit, Central Valley Water Board staff will work with other agencies and regional monitoring programs to monitor chemical constituents, pesticides, and radionuclides contained in the Title 22 of the California Code of Regulations, as well as relevant constituents associated with the narrative and site specific water quality objectives associated with MUN use, approximately every 3 to 5 years in major water bodies identified with existing or potential MUN use. These water bodies include, but are not limited to the Sacramento River, Feather River, San Joaquin River and Delta. The data gathered will support Watershed Sanitary Surveys (Cal. Code Regs, tit. 22, § 64665 et seq.) as well as the California Integrated Report (Clean Water Act Section 303(d)/305(b)).*"

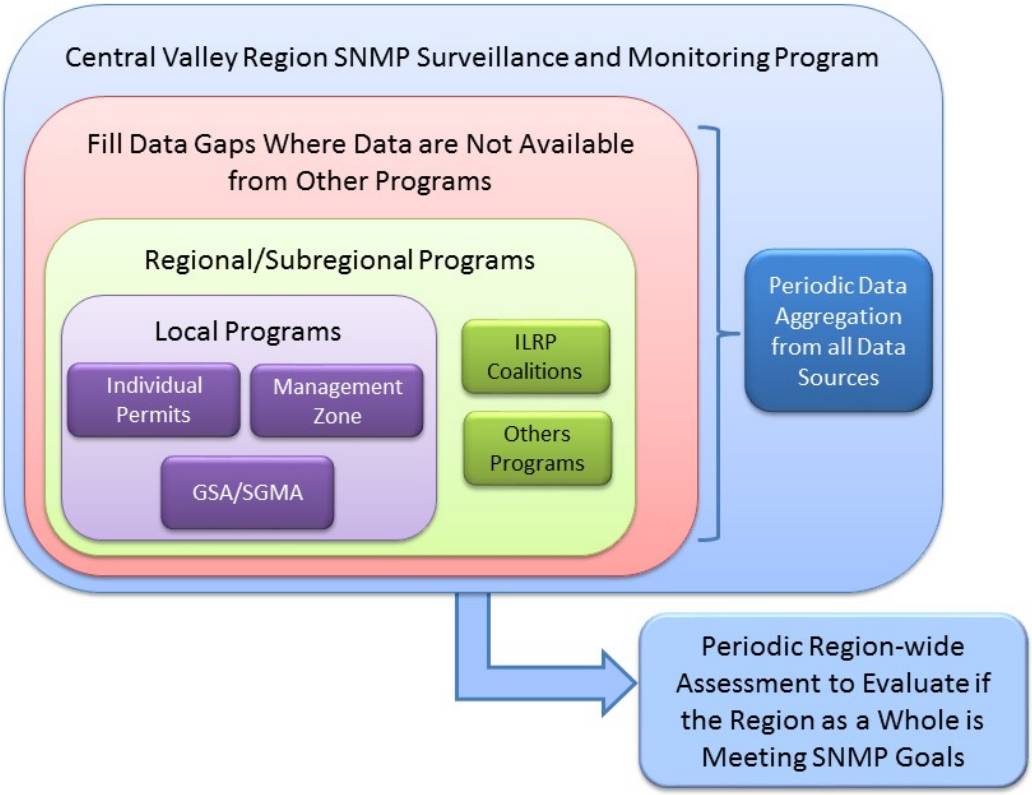
The amendment is continuing through the required approval process with the State Water Board, Office of Administrative Law and as appropriate, USEPA, and is not yet in effect.

4.2.4.1.2 Alternative to Build Off of Existing Monitoring Programs Utilizing Guidance Developed in through the CV-SALTS Initiative

The CV-SALTS initiative prepared a surveillance and monitoring program (SAMP) report (CDM Smith, 2016c) to be used as guidance in the development of a final surveillance and monitoring program to support a Salt and Nitrate Control Program. The SAMP focused on developing a template for groundwater assessments that could be readily modified to various special areas such as a groundwater basin, sub-basin, or management zone. Stakeholder discussions on various elements of a SAMP that includes surface water components have continued. Alternatives to various elements of a surveillance and monitoring program were discussed by stakeholders and are provided in Table D-4 in Appendix D. Options to specific elements identified are included in the discussion below.

The foundation of this alternative approach is to rely on existing local, regional and subregional monitoring programs to the maximum extent practicable. Figure 4–7 display how such a program can be developed.

Figure 4 - 7. Illustration of SNMP Surveillance and Monitoring that Relies on Existing Monitoring Program Data



This alternative proposes that a surveillance and monitoring program to evaluate the effectiveness of Salt and Nitrate Control Program implementation should be consistent with the two following key objectives: (a) utilize a statistically–representative approach for evaluating ambient water quality and water quality trends across the Central Valley; and (b) establish a cost–effective program that relies on existing monitoring programs and data collection efforts to the maximum extent possible. Following is a more detailed discussion of each objective:

- Develop a monitoring program that will allow for statistically–representative ambient water quality determinations and trend analyses.
    - Establish a program that provides the requisite data to inform management and regulatory decisions and implementation strategies. The program is intended to provide the requisite data to be able to determine the effectiveness of Salt and Nitrate Control Program measures being implemented on a groundwater basin/sub-basin scale or other scales as appropriate and be sufficient to determine the need for program modifications.

- Establish a program that is robust and dense enough, both spatially and temporally, to make the ambient water quality determinations in a complex geographic, hydrologic, and hydrogeological environment.
- Collect ancillary data required to estimate volume–weighted ambient groundwater quality, including groundwater elevations.
- Incorporate monitoring stations associated with planned recycled water projects, including indirect potable reuse projects, to the extent that this information is available.
- Establish a dynamic monitoring network that can be (a) expanded to meet future data needs or (b) reduced based on findings from periodic data analyses that show less monitoring coverage is warranted.

- Develop a cost–effective monitoring program.
  - Utilize existing and proposed monitoring programs and existing and proposed local monitoring wells to the maximum extent practicable in order to be cost–effective and consistent. Incorporate other monitoring programs, including but not limited to, the *Irrigated Lands Regulatory Program (ILRP) trend monitoring, the Groundwater Ambient Monitoring and Assessment (GAMA) shallow domestic well monitoring program, routine Title 22 sampling program, and Waste Discharge Requirements (WDR) sampling programs*.
  - Adjust detail and intensity of monitoring based on need within regions of the Central Valley. Fewer wells and surface water monitoring sites may be acceptable for areas where the spatial distribution of TDS and nitrate is relatively small.
  - Assess water quality only as frequently as necessary to meet the objective of the program. Regional groundwater quality changes typically occur over a number of years; therefore, evaluation of ambient TDS and nitrate is recommended every 5 years, using a moving 10-year average of well concentration data. Surface water evaluations should be consistent and support activities under development of the Integrated Report which evaluates ambient surface water conditions and identifies impairments to beneficial uses as required under Sections 303d and 305b of the Clean Water Act.

The Central Valley Water Board will require salt and nitrate dischargers to provide information to the Board to satisfy the monitoring objectives. The information may come from the dischargers' monitoring efforts; monitoring programs conducted by state or federal agencies or collaborative watershed efforts; or from special studies evaluating effectiveness of management practices. Information gathered is anticipated to be consolidated and evaluated by the entity leading the monitoring effort with summary reports that answers the following management questions:

- What are the ambient conditions and trends of salinity in surface waters throughout the Central Valley?
- What are the ambient conditions and trends of salinity and nitrate in the following groundwater zones for groundwater basins within the Central Valley Regions: shallow; upper; lower; and production?

  Other Option Considered: Do not require evaluation of the lower zone.

- To what extent has the Nitrate Control Program facilitated the provision of safe drinking water supplies to both municipal and domestic users?

  Other Option Considered: Remove this management question from the monitoring and surveillance section and track as part of permit conditions under the Nitrate Control Program.

Monitoring and Surveillance Program Requirements

Within two years of the effective date of the Salt and Nitrate Control Program, the entity leading the effort will submit to the Central Valley Water Board for approval, a Work Plan and Quality Assurance Project Plan that is compliant with all requirements set forth in this section. Work under the plan will be initiated within 30 days of Central Valley Water Board approval. Permittees that discharge salt or nitrate in the Central Valley Region shall participate in the preparation of the Program Assessment Report by contributing funding for the preparation of the report and ensuring required information is available to the lead entity. Permittees that discharge salt or nitrate must either gather needed information required by the Work Plan for their area of contribution and provide the information to the lead entity in a format acceptable to the lead entity or permittees must demonstrate their support for the lead entity to gather needed information by submitting documentation of such support from the lead entity. The requirements for participation shall be established by the lead entity and will consider factors such as participation in other existing groundwater quality monitoring programs that will contribute data to the Salt and Nitrate Monitoring Program, resources required to develop and implement the Monitoring Program, including preparation of the Periodic Assessment Reports, and other factors.

It is anticipated that the groundwater portion of the monitoring program will build off of the most recent version of the CV-SALTS database (Luhdorff & Scalmanini and Larry Walker Associates, 2014) and will utilize guidance developed as part of the CV-SALTS initiative (e.g. Chapter 5 of the Central Valley SNMP (CV-SALTS 2016).

Surface Water Requirements

To assess ambient conditions and trends of salinity and other secondary MCLs in surface waters throughout the Central Valley, the monitoring program for surface waters will rely to the maximum extent possible on data collected by existing Central Valley monitoring and assessment programs already established in the region. Data collected by existing programs may be supplemented by the collection of additional data by the Salt and Nitrate Control Program. The Work Plan will describe how the entity leading the Salt and Nitrate Surveillance and Monitoring Program will evaluate the following in major water bodies including but not limited to the Sacramento River, Feather River, San Joaquin River and Delta as well as their major tributaries:

- Ambient conditions, including monthly and annual average concentrations for salinity and other secondary MCLs; and

- Trends for salinity and other secondary MCLs.

The Work Plan will describe how these water quality evaluations will be completed using existing monitoring and assessment program data and, where needed, supplemental data collected by the Salt and Nitrate Control Program.

Other Options Considered:

- Only include evaluations for salinity constituents (EC, TDS, chloride, sulfate and sodium).
- Only include evaluations for secondary MCLs where a change has occurred in compliance measurements through Basin Plan Amendments related to the Salt and Nitrate Control Program.
- Allow the Work Plan to specify the appropriate frequency for sample analysis to determine ambient concentration and trends.

An assessment of ambient water quality and trends shall be completed for surface waters at least once every five years.

Groundwater Requirements

The Salt and Nitrate Groundwater Monitoring Program (Groundwater Monitoring Program) shall be sufficiently robust to evaluate ambient water quality and trends in groundwater basins in the floor of the Central Valley Region, including all sub-basins within the following groundwater basins defined by Department of Water Resources Bulletin 118: Redding Area (#5–6); Sacramento Valley (#5–21); and San Joaquin Valley (#5–22). Remaining groundwater basins will be incorporated after the first phase. Water quality data shall be reported from groundwater wells included in the monitoring program at least once each calendar year.
The Groundwater Monitoring Program shall utilize Chapter 5 of the CV-SALTS SNMP (2016) and the SAMP (CDM Smith, 2016c) as guidance and shall include, at a minimum, the following components:

- A Work Plan that includes:
  - Groundwater Monitoring Program goals;
  - Entities responsible for the collection and reporting of data from groundwater wells incorporated into the Groundwater Monitoring Program;
  - Identification of the groundwater monitoring wells to be included in the program and how the selected wells will provide a representative assessment of ambient water quality and trends by basin/sub-basin;
  - Governance and funding mechanisms and agreements necessary to ensure the Groundwater Monitoring Program obtains the required data;
  - Procedures for review and revision of the Groundwater Monitoring Program;
  - A Quality Assurance Project Plan (QAPP) that includes:
    - Characteristics of each well incorporated into the program, e.g., well types, logs and construction data, where available;
    - Sample collection requirements, e.g., water quality parameters, sampling frequency and collection methods;
    - Data reporting and management requirements

- Approach to assess ambient water quality conditions and water quality trends for TDS/EC and Nitrate as Nitrogen in the Upper, Lower and Production Zones for each required groundwater basin/sub-basin; and

- Approach to evaluate the progress of the Salt and Nitrate Control Program based on trends in water quality.

To the extent practicable, the Groundwater Monitoring Program will utilize data collected by existing Central Valley Water Board water quality monitoring programs to be cost–effective and establish consistency in how groundwater quality data are collected, managed, assessed and reported. In this regard, the Irrigated Lands Regulatory Program Groundwater Quality Trend Monitoring Program implemented by the Central Valley Groundwater Monitoring Collaborative is anticipated to provide the foundation for the development of the Groundwater Monitoring Program.

Data developed under the Irrigated Lands Regulatory Program will be supplemented as needed, to ensure that the periodic Program Assessment Report is completed on schedule. Sources of supplemental data include but are not limited to Groundwater Ambient Monitoring and Assessment (GAMA) shallow domestic well monitoring program; Oil and Gas Regional Groundwater Monitoring Program; routine Title 22 sampling program; monitoring programs associated with implementation of Groundwater Sustainability Plans; monitoring programs established to comply with WDRs/Conditional Waivers; monitoring programs established as part of the approval of a management zone under the nitrate control program, or through the direct collection of groundwater quality data.

An assessment of ambient water quality conditions and trends shall be completed at least once every five years consistent with the requirements of the approved Work Plan. The first Program assessment report shall be submitted to the Central Valley Water Board no later than five years after the approval of the Work Plan and every five years thereafter, unless a revised reporting schedule is approved by the Central Valley Water Board Executive Officer.

4.2.4.2 Evaluation of Alternatives

To be consistent with the requirements of the Recycled Water Policy as well as with the requirement that any implementation program shall include a description of surveillance to determine compliance with objectives in addition to the ability to evaluate whether the Salt and Nitrate Control Program is progressing toward meeting its goals. The resulting surveillance and monitoring program will need to capture both region-wide trends in surface and groundwater quality as well as impacts of specific management activities. To be consistent with the Recycled Water Policy preferred approach, the resulting program should also collect samples from existing wells if feasible in order to provide a reasonable and cost-effective design.

The No Action alternative utilizes the sampling design already incorporated in the Basin Plans. Monitoring for salt and nitrate is inconsistent between programs in order to meet individual program goals, and there is no centralized database in which to compile data collected. A framework is not in place that would allow comparable data collection on both region-wide and localized scales. Evaluation would continue permit-by-permit and additional resources would be required to compile information from different data sources in order identify existing information, potential data gaps and revise requirements as needed with a possibility of a region-wide Water Code section 13267 to require needed information.

The proposed alternative sets up an adaptable, centralized framework that provides time for the development of a detailed Work Plan and quality assurance project planned based on guidance developed under the CV-SALTS initiative. The alternative is consistent with the Recycled Water Policy monitoring requirements in that the alternative requires development of a basin/sub-basin wide monitoring plan that includes an appropriate network of monitoring locations that would be adequate to provide a reasonable, cost–effective means of tracking concentrations of salts and nitrate. The alternative incorporates the flexibility to adjust monitoring design to highlight areas near water supply wells and groundwater recharge projects. In addition, the foundation of the alternative is to utilize existing monitoring locations and date whenever feasible and to fill in with additional sites and information if needed for statistical–representativeness with a focus on the most critical areas of the Central Valley. One point of inconsistency with the Recycled Water Policy is that the proposed alternative requires a report every five years, rather than every three years.

Options identified to elements within the proposed alternative included: removing the management question related to evaluating facilitation of safe drinking water supplies; limiting secondary MCL constituents assessed; and allowing flexibility during Work Plan development to determine appropriate sampling frequency by location.

Removing the management question related to facilitation of safe drinking water supplies: A major goal of the Nitrate Control Program is to develop a framework that prioritizes provision of safe drinking water supplies for users of groundwater with elevated nitrate concentrations. Part of the evaluation of the success of this effort is to identify where there may be areas of concern, whether those areas are expanding, impacted drinking water users, and the number of users who have received safe drinking water supplies. The option to remove this management question recognizes that tracking of the Nitrate Control Program activities will be occurring within the Priority Basins as part of program requirements. While monitoring and surveillance of groundwater conditions and trends will be useful to permittees developing compliance projects, the specific tracking of users receiving safe drinking water as a result of the program may be better provided by the permittees initiating the efforts. Compilation of the information provided by permittees will fall to Water Board staff.

Limiting Secondary MCL Constituents Assessed: One of the components of the overall Salt and Nitrate Control Program includes clarification of the use of secondary MCL when determining protection of MUN. Amendments are recommended related to the use of ranges for salinity constituents in Table 64449–B as well as the use of annual averaging for all secondary MCLs and the potential to evaluate compliance based on using a filtered sample that is then analyzed with the applicable and approved analytical methodology. For metals, this would be total recoverable metals. The current alternative proposes evaluating all secondary MCLs using existing Central Valley monitoring and assessment programs. Options proposed include limiting evaluation to salinity related constituents and limiting evaluation to secondary MCLs that may be impacted by the proposed amendments.

Allowing flexibility during Work Plan development to determine appropriate sampling and evaluation frequency by location: Due to the diversity of the Central Valley, flexibility should be allowed during work plan development to utilize a monthly/annual average as a default unless information is available to justify an alternative evaluation period. Restricting evaluation criteria to monthly and annual averages may be inappropriate in areas where historical information shows little change over extended period (e.g. some groundwater basins).

4.2.4.3 Recommendation

The alternative to Build Off of Existing Monitoring Programs Utilizing Guidance Developed through the CV-SALTS Initiative is recommended with some adjustment based on the options identified as follows:

- The management question related to documenting the extent that the Nitrate Control Program has facilitated the provision of safe drinking water supplies to both municipal and domestic users should be removed from this portion of the overall Salt and Nitrate Control Program. Such information is more appropriately compiled by the permittees participating in the Priority Basins of the Nitrate Control Program.
- The evaluation of secondary MCLs should be limited to the constituents that may be impacted by the proposed amendments.
- Flexibility should be provided to identify appropriate sampling, evaluation and reporting timeframes within the work plan.

The following are the anticipated steps, which are recommended for implementation during development of the Basin Plan amendments to implement the SNMP in order to ensure that a monitoring program is ready for implementation within the proposed timelines.

- Identify existing and Planned Monitoring Program including coordination with newly developed Groundwater Sustainability Agencies under the SGMA Program
- Draft final selection of monitoring wells for inclusion in the ambient trend analysis program and initiate outreach for access.
- Draft initial Sampling and Analysis Plan and Quality Assurance Project Plan for timely identification of potential issues with consistency and data management.

4.2.5 Definitions and Terminology Specific to the Salt and Nitrate Control Program

Stakeholders identified the need for consistent terminology when discussing various components and elements of the Salt and Nitrate Control Program. Several of the terms utilized in the Salt and Nitrate Control Program have a specific connotation related to program requirements but are also found in other sections of the Basin Plans with limited if any definition.

4.2.5.1 Alternatives

4.2.5.1.1 No Action Alternative

No change to current Basin Plan use of terminology.

4.2.5.1.2 Incorporate Definitions and Terminology Specific to the Salt and Nitrate Control Program

A list of definitions utilized throughout the components of the Salt and Nitrate Control Program is presented in the proposed amendment language. Options to select definitions discussed with stakeholders has been summarized in Table D–5 in Appendix D. An example of the terminology that was developed is provided in Figures 4–8 and 4–9 to provide consistency when discussing various zones within a Central Valley aquifer system as related to regulatory requirements under the proposed Salt and Nitrate Control Program.

4.2.5.2 Evaluation

Since several terms are utilized to explain different evaluation and compliance requirements under the Salt and Nitrate Control Program it is appropriate to have a consistent definition for the terms. Since these terms may also occur in other portions of the Basin Plans, it is equally appropriate to ensure that the terminology is identified to be applied specifically to the Salt and Nitrate Control Program requirements and not to other regulatory efforts.

4.2.5.3 Recommendation

Incorporate Definitions and Terminology Specific to the Salt and Nitrate Control Program as part of the overall Basin Plan Amendment.

4.2.6 Proposed Modifications to the Basin Plan's Variance Policy

A permit applicant or permittee subject to an NPDES permit may apply to the Central Valley Water Board for a variance from a surface water quality standard for specific constituent(s), as long as the constituent is not a priority toxic pollutant identified in 40 C.F.R § 131.38(b)(1) and the permittee provides an application that is in accordance with the requirements specified in the Policy. A variance must be approved by the USEPA before it is in effect. The Central Valley Water Board may adopt variance programs that provide streamlined approval procedures for multiple dischargers that share the same challenges in achieving their water quality based effluent limitations(s) for the same pollutant(s). The Basin Plans currently contain the *Variance Program for Salinity Water Quality Standards* which is a multiple discharger variance program. Variances may be for a single discharger or group of dischargers meeting similar requirements. The alternatives discussed below are in regard to the *Variance Program for Salinity Water Quality Standards* and whether the existing program should be modified to align it with the Salt and Nitrate Control Program.

4.2.6.1 Alternatives

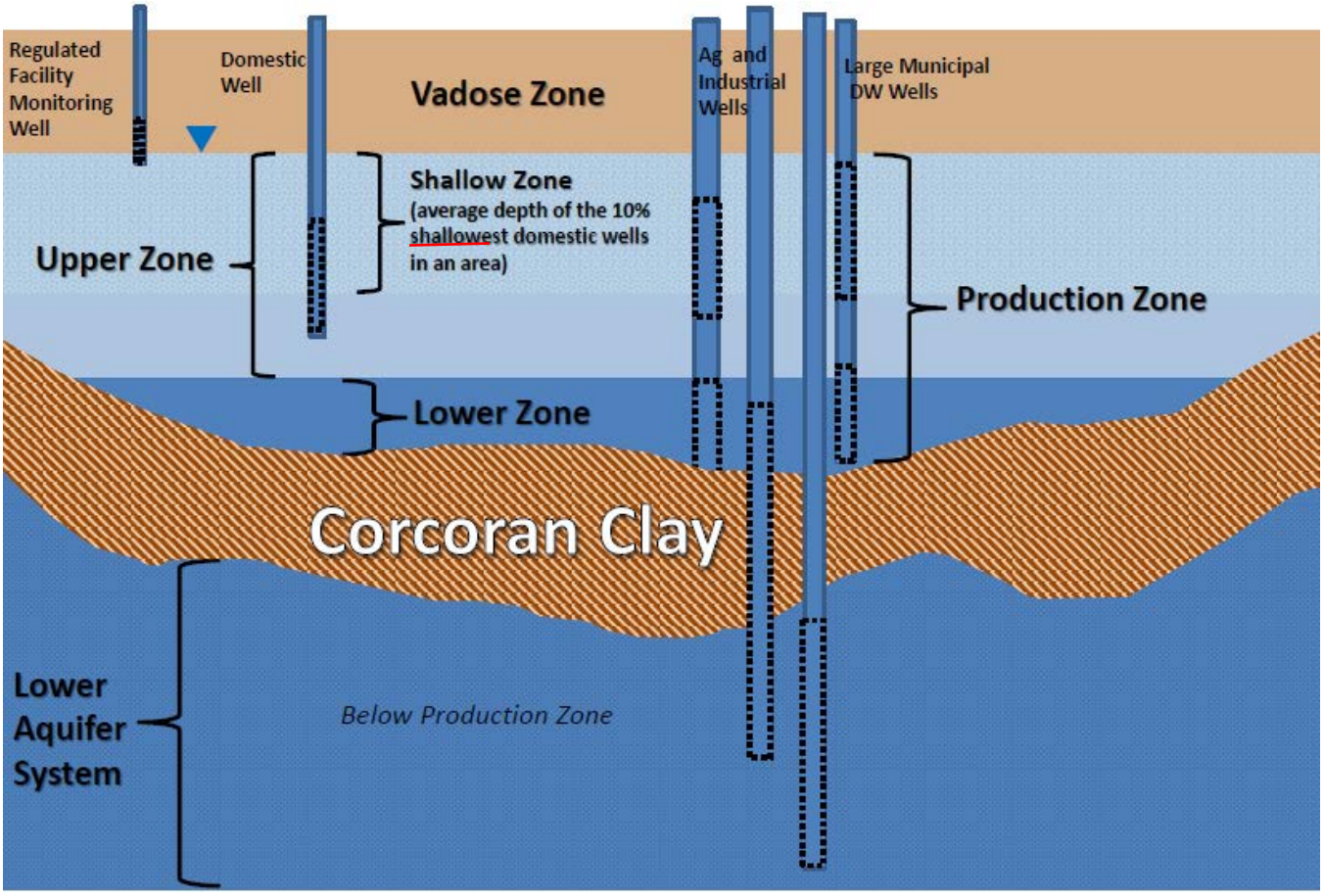
Two alternatives were identified: 1) No Action Alternative; and 2) Modify the Current Salinity Variance Program.

4.2.6.1.1 No Action Alternative

On June 6, 2014, the Central Valley Water Board adopted amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins (SRSJR Basin Plan) and Water Quality Control Plan for the Tulare Lake Basin (TLB Basin Plan) (collectively hereafter referred to as "Basin Plans") that included a Variance Program for Salinity (Salinity Variance Program)[43]. On March 17, 2015, the State Water Board adopted Resolution No. 2015–0010 approving Basin Plan amendments to include the Salinity Variance Program. Because the Salinity Variance Program applies to surface waters, and is considered a water quality standards action under the Clean Water Act (CWA), the Salinity Variance Program was subject to approval by the United States Environmental Protection Agency (USEPA). The Salinity Variance was approved by U.S. EPA on July 8, 2016. With its approval, USEPA specifically limited application of the Salinity Variance Program to effluent limitations being adopted to protect the agricultural beneficial use (AGR). Further, the Salinity Variance Program applies only to municipal publicly owned treatment works (POTWs) that have a situation similar to or comparable to the case study cities included in the Central Valley Water Board's supporting documents.

[43] Central Valley Water Board Resolution No. R5–2014–0074.

Figure 4 - 8. Schematic of Aquifer System Within Corcoran Clay Extent[1]



Legend

Unsaturated (Vadose) Zone

Groundwater Table - Top of saturated aquifer at the top of Upper Zone

Shallow Zone - Depth of the shallowest 10% of the domestic wells in an area (or alternative identified in the Nitrate Control Program).

Production Zone

The portion of basin or sub-basin from which the majority of groundwater is being pumped and utilized.

Upper Zone The portion of the groundwater basin, sub-basin or management zone from which most domestic wells draw water (Defined by well depths and screening intervals).

Lower Zone The remaining portion of a groundwater basin or sub-basin's Production Zone excluding the Upper Zone. Wells constructed in the Lower Zone are generally used for some municipal supply and/or agricultural purposes.

Below Production Zone

Well Depth

Screen Depth

[1] For the purposes of this program, calculations for Upper, Lower and Production Zones do not extend below the Corcoran Clay

When it adopted the Salinity Variance Program, the Central Valley Water Board recognized that management of salinity in surface and ground waters is a major challenge for dischargers. The Central Valley Water Board further determined that during the development and initial implementation of Salt and Nitrate Management Plans prepared as part of the CV-SALTS initiative, it was appropriate to allow municipal and domestic wastewater dischargers to apply for a variance from salinity water quality standards if they have, or will have, water quality based effluent limitations for salinity that they are unable to meet and they were actively participating in the CV-SALTS initiative.[44] The Salinity Variance Program applies to salinity water quality standards that are defined to include water quality standards for only the following constituents: electrical conductivity, total dissolved solids, chloride, sulfate and sodium. The current Salinity Variance Program prohibits the Central Valley Water Board from approving any salinity variance after June 30, 2019. The sunset date was included because the Central Valley Water Board intended that any extension, or permanent, long-term Salinity Variance Program should be developed through the CV-SALTS process and that stakeholders needed to make appropriate recommendations for such a policy in the Salt and Nitrate Management Plan (SNMP).

Under the current program, the authority to approve a variance for a specific salinity water quality standard does not automatically grant a variance in any given instance. Variances must be authorized through a Central Valley Water Board action that is subject to notice, comment and a public hearing on the salinity variance application.

In general, the current Salinity Variance Program allows POTW dischargers that have a situation that is similar to or comparable with the case study cities[45] to apply to the Central Valley Water Board for a variance to discharge requirements from the implementation of water quality objectives for salinity. The variance applies to the issuance of water quality-based effluent limitations (WQBELs) based on a salinity water quality standard.

Under the Salinity Variance Program, a discharger's application must include in part the following:[46]

- Identification of the salinity constituents for which the variance is sought;
- Identification of the receiving surface water, and any available information with respect to receiving water quality and downstream beneficial uses for the specific constituent;
- Identification of the WQBEL that is being considered for adoption, or has been adopted in the NPDES permit;
- A description of salinity reduction/elimination measures that have been undertaken as of the application date, if any;

[44] Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins and the Water Quality Control Plan for the Tulare Lake Basin To add Policies for Variances from Surface Water Quality Standards for Point Source Dischargers, Variance Program for Salinity, and Exception from Implementation of Water Quality Objectives for Salinity, Final Staff Report, June 2014 (Final Staff Report), at p. 45. (Central Valley Water Board, 2014)

[45] The three case study cities are City of Tracy, City of Stockton and City of Manteca. In short, each city cannot consistently meet stringent salinity WQBELs imposed in their NPDES permits, and each city has implemented source control programs. While water quality improved, such improvements were not sufficient to consistently comply with effluent limitations. Further, it was determined that factors under title 40 of the Code of Federal Regulations, Sections 131.10(g)(3) and 131.10(g)(6) were met because imposition of WQBELs on the POTWs would not result in attainment of water quality standards, and because the economic impact of implementing reverse osmosis would be substantial (Final Staff Report, pp. 7, 28–29.) (Central Valley Water Board, 2014).

[46] Final Staff Report, pp. 43–45. (Central Valley Water Board, 2014)

- A Salinity Reduction Study Work Plan that includes specified minimum information;
- An explanation of the basis for concluding that there are no readily available or cost–effective methodologies available to consistently attain the WQBELs for salinity;
- A detailed discussion explaining why the permittee's situation is similar to or comparable to the case studies;
- A detailed discussion of proposed interim discharge limitation(s) that represents the highest level of treatment that the permittee can consistently achieve during the term of the variance;
- Documentation of the applicant's active participation in CV-SALTS as indicated by a letter of support from CV-SALTS; and
- A detailed plan of how the applicant will continue to participate in CV-SALTS and how the applicant will contribute to the development and implementation of the SNMP.

A key requirement for granting a salinity variance, is the requirement that the discharger needs to prepare and implement a Salinity Reduction Study Work Plan. A Salinity Reduction Study Work Plan shall at a minimum include the following:[47]

1) Data on current influent and effluent salinity concentrations;
2) Identification of known salinity sources;
3) Description of current plans to reduce/eliminate known salinity sources;
4) Preliminary identification of other potential sources;
5) A proposed schedule for evaluating sources; and
6) A proposed schedule for identifying and evaluating potential reduction, elimination, and prevention methods.

After considering the dischargers' application, the Central Valley Water Board may adopt a variance from WQBEL based on salinity water quality standards after public notice and hearing. The Central Valley Water Board may take action to approve a variance and issue a new, or reissue or modify an existing NPDES permit as part of the same Board meeting. The permit must contain all conditions necessary to implement the variance, which includes in part the following: (a) interim effluent limitations that are attainable during the term of the variance; (b) a requirement to implement the Salinity Reduction Study Work Plan; (c) a requirement to participate in CV-SALTS; (d) any additional monitoring that is determined necessary; (e) a provision to reopen and modify the permit based on any revision to the variance; and (f) other conditions determined necessary to implement the terms of the variance. Under the existing Salinity Variance Program, variances can be renewed upon the request of the discharger although no salinity variances can be approved after 30 June 2019.

4.2.6.1.2 Alternative to Modify the Current Salinity Variance Program

This alternative proposes that the current Salinity Variance Program be amended to provide the Central Valley Water Board with the necessary authority and flexibility to permit salinity

[47] Final Staff Report, p. 44.

discharges in a manner that is consistent with the goals, milestones and timelines of the recommended Salt Control Program.

1) Extend the provision prohibiting the Central Valley Water Board from authorizing new salinity variances or reauthorizing previously approved salinity variances from June 30, 2019 to 15 years from the effective date of Basin Plan amendments that revise the Salinity Variance Program. As part of the Prioritization and Optimization Study, the Salinity Variance Program should be reconsidered, and it should be determined at that time if the Salinity Variance Program, and the terms related thereto, should be revised to implement Phase II of the Salinity Management Strategy.
2) Extend application of the Salinity Variance Program to Water Quality Based Effluent Limits (WQBELs) for salinity water quality standards that are related to the MUN beneficial use, and not just the AGR beneficial use.
3) Revise the current Salinity Variance Program to require participation in the Prioritization and Optimization Study (P&O Study).
4) The current Salinity Variance Program should be amended to make clear that salinity variances are intended to facilitate implementation of the phased Salt Control Program, and that salinity variances are not available to individuals/permittees that elect not to participate P&O Study. As indicated previously, application of salinity variances for Phases II and III of the Salinity Management Strategy should be considered in conjunction with findings from the P&O Study, and any Basin Plan amendments determined appropriate at the close of Phase I.

Salinity variances be authorized by the Central Valley Water Board in relatively the same manner as set forth in the current Salinity Variance Program. The conditions for authorizing the salinity variance would remain the same, except as revised based on the recommendations above.

Authorization for salinity variances may be granted by the Central Valley Water Board for individual dischargers, or for multiple dischargers under a watershed-based NPDES permit for salinity discharges. Terms and conditions associated with the granting of a salinity variance will be incorporated into relevant NPDES permits, and failure to comply with such terms and conditions may result in the termination of the variance and/or an enforcement action.

4.2.6.2 Evaluation

The Central Valley Water Board's original rationale for adopting the Salinity Variance Program was to provide temporary permitting flexibility while CV-SALTS was developing the SNMP, and to encourage dischargers throughout the region to actively participate in that process. The existing Salinity Variance Program included a sunset date to encourage participation and completion of CV-SALTS SNMP. If CV-SALTS stakeholders determined that an extension, or permanent Salinity Variance Program was necessary to ensure successful implementation of the SNMP, the Central Valley Water Board instructed the stakeholders to describe and justify their recommendations in the SNMP itself. Alternative 2 reflects that recommendation.

The proposed Salt Control Program recommends a long-term Salinity Management Strategy that is phased over time. The first phase (Phase I) consists of developing a Prioritization and Optimization Study (P&O Study) for salinity management, which is intended to further define the

conceptual design of SSALTS[48] into a feasibility study that identifies appropriate regional and sub–regional projects, including location, routing and implementation/operation of salt management projects. Phase II will generally consist of environmental permitting, obtaining funding, and engineering and design. Phase III would then consist of construction of physical projects, as identified in previous phases, to manage salt on a long-term, comprehensive basis, e.g., a Central Valley regulated brine line. Because salinity management is phased in over time, the Salt Control Program recommends that an Interim Salinity Permitting Approach be implemented during Phase I, and then be re–evaluated prior to implementation of Phase II. The Salt Control Program recommends that the Interim Salinity Permitting Approach be set in place for 15 years to coincide with completion of the P&O Study and any additional Basin Plan Amendments needed to facilitate Phase II.

The Interim Salinity Permitting Approach for Phase I would essentially allow dischargers to participate in the P&O Study in lieu of meeting stringent end–of–pipe salinity limitations. Dischargers would either be subject to conservative permitting approaches or could elect to participate in the P&O Study.

For surface water dischargers that are subject to federal National Pollutant Discharge Elimination System (NPDES) permits, and municipal POTWs in particular, the federal regulatory process provides the Central Valley Water Board with little discretion in allowing dischargers to participate in the P&O Study in lieu of meeting strict WQBELs when there is reasonable potential to exceed water quality standards. To allow POTWs that are subject to NPDES permits to participate in the Priority and Optimization Study, such dischargers may need to seek approval of a variance from meeting effluent limitations based on salinity water quality standards. To do so, the current Salinity Variance Program needs to be extended and expanded. Those not participating in the P&O Study would not be eligible to obtain a variance under the Salinity Variance Program.

4.2.6.3 Recommendation

Staff recommends amending the existing Variance Program for Salinity Water Quality Standard in the manner identified in the alternative to provide the Central Valley Water Board with the necessary authority and flexibility to permit salinity discharges from permittee subject to a NPDES permit in a manner that is consistent and supportive of the Salt Control Program.

4.2.7 Proposed Modifications to the Basin Plans' Exceptions Policy

The Central Valley Water Board has within its authority the ability to grant exceptions to water quality objectives for non-NPDES dischargers to surface water and for discharges to groundwater when the Board finds that it is infeasible, impracticable or unreasonable to prohibit the otherwise non–compliant discharge. The Basin Plans currently provide clarification to this authority in regards to salinity constituents under the Salinity Exception Policy. The existing Salinity Exception Policy is scheduled to sunset on 30 June 2019. The alternative discussed below is in regard to whether the existing program should be modified to align it with the proposed Salt and Nitrate Control Program as well as provide clarification on the requirements to pursue and exception to boron water quality standards.

[48] *Strategic Salinity Alternatives Land and Transportation Study (SSALTS), Final Phase 2 Report: Development of Potential Salt Management Strategies*, prepared by CDM Smith on behalf of CV-SALTS, October 1, 2014

4.2.7.1 Alternatives

Two alternatives were identified: 1) No Action Alternative; and 2) Modify and Update the Current Exception Policy to Apply to Salt, Nitrate and Boron.

4.2.7.1.1 No Action Alternative

In general, the current Exceptions Policy allows dischargers to apply to the Central Valley Water Board for an exception to discharge requirements from the implementation of water quality objectives for salinity. The definition of "salinity" includes only: electrical conductivity, total dissolved solids, chloride, sulfate and sodium. The current Policy does not provide the Central Valley Water Board with guidance to approve exceptions for any other pollutants including nitrate and boron. The exception may apply to the issuance of effluent limitations and/or groundwater limitations (i.e., receiving water limitations) that implement water quality objectives for salinity in groundwater, or to effluent limitations and/or surface water limitations that implement water quality objectives for salinity in surface water discharges that are not subject to regulation under the Clean Water Act.

The current policy does not automatically grant an exception in any given instance. Exceptions must be authorized through a separate Central Valley Water Board action. Also, under the current policy, exceptions must *"…be set for a term not to exceed ten years. For exception terms greater than five years, the Regional Water Board will review the exception five years after approval to confirm that the exception should proceed for the full term."*[49] That review must be conducted in a public hearing.

Under the current Exception Policy, a discharger's application must include the following:[50]

- An explanation/justification as to why the exception is necessary, and why the discharger is unable to ensure consistent compliance with existing effluent and/or groundwater/surface water limitations associated with salinity constituents;
- A description of salinity reduction/elimination measures that the discharger has undertaken as of the date of application, or a description of a salinity–based watershed management plan and progress of its implementation;
- A description of any drought impacts, irrigation, water conservation and/or water recycling efforts that may be causing or cause the concentration of salinity to increase in the effluent, discharges to receiving waters, or in receiving waters;
- Copies of any documents prepared and certified by another state or local agency pursuant to Public Resources Code Section 21080 et seq.; or, such documents as are necessary for the Central Valley Water Board to make its decision in compliance with Public Resources Code section 21080 et seq.;
- Documentation of the applicant's active participation in CV-SALTS as indicated by a letter of support from CV-SALTS; and
- A detailed plan of how the applicant will continue to participate in CV-SALTS and how the applicant will contribute to the development and implementation of the SNMP.

A key requirement for granting an exception, preparation and implementation of a Salinity

[49] Variance & Exceptions Policy; page 51.

[50] Variance & Exceptions Policy; page 50.

Reduction Study Work Plan, or a salinity–based watershed management plan. A Salinity Reduction Study Work Plan shall at a minimum include the following:[51]

1) Data on current influent and effluent salinity concentrations;

2) Identification of known salinity sources;

3) Description of current plans to reduce/eliminate known salinity sources;

4) Preliminary identification of other potential sources;

5) A proposed schedule for evaluating sources; and

6) A proposed schedule for identifying and evaluating potential reduction, elimination, and prevention methods.

A salinity–based watershed management plan shall at a minimum include the following:[52]

1) A discussion of the physical conditions that affect surface water or groundwater in the management plan area, including land use maps, identification of potential sources of salinity, baseline inventory of identified existing management practices in use, and a summary of available surface and/or groundwater quality data;

2) A management plan strategy that includes a description of current management practices being used to reduce or control known salinity sources;

3) Monitoring methods;

4) Data evaluation; and

5) A schedule for reporting management plan progress.

After considering the discharger's application, the Central Valley Water Board may adopt an exception for salinity constituents after public notice and hearing through a resolution, or by amending WDRs/Conditional Waivers.

4.2.7.1.2 Alternative to Modify and Update the Current Basin Plans' Exception Policy to Apply to Salt, Nitrate and Boron.

The proposed Salt and Nitrate Control Program recommends that exceptions be authorized by the Central Valley Water Board subject to certain conditions and performance obligations on the discharger(s). This provides a mechanism to ensure that exceptions serve the greater good. Two important expectations governing the manner in which exceptions are likely to be considered by the Central Valley Water Board are:

1) Exceptions for nitrate will not be considered unless an adequate supply of clean, safe, reliable and affordable drinking water is available for those living in the area adversely affected by the non–compliant discharge(s). Said availability must take the form of a detailed work plan, schedule of milestones, and financial commitments to provide interim and permanent alternate water supplies. Performance bonds may be required to ensure timely implementation.

[51] Variance & Exceptions Policy; page 51.

[52] Variance & Exceptions Policy; page 52.

2) Dischargers are expected to continue to make reasonable "best efforts" to comply with applicable WDRs. The specific nature of these efforts will be identified at the time the exception is proposed and authorized.

Under the proposed Salt and Nitrate Control Program, authorization for exceptions may be granted by the Central Valley Water Board for individual dischargers, recognized third party groups on behalf of its members or for multiple dischargers under a management zone. Terms and conditions associated with the granting of an exception will be incorporated into relevant WDRs, and failure to comply with such terms and conditions may result in the termination of the exception and/or an enforcement action.

Other Option Considered: Exceptions may only be applied on a permit-by-permit basis, not to a management zone.

This alternative proposes that the Exception Policy be amended to provide the Central Valley Water Board with the necessary authority and flexibility to permit discharges in a manner that is consistent and supports the proposed Salt and Nitrate Control Program. The majority of existing conditions required for a salinity exception are proposed as boron conditions, while the salt and nitrate conditions are linked to requirements under the proposed Salt and Nitrate Control Program. The following conditions apply to salt, nitrate and boron.

- Delete the provision prohibiting the Central Valley Water Board from authorizing new exceptions or reauthorizing previously approved exceptions after June 30, 2019. Because the Central Valley Water Board can decide for itself whether to grant or not grant specific exceptions, there is no need for any sunset provision that restricts their overall authority to make such decisions.

- Add nitrate and boron to the list of chemical constituents for which the Central Valley Water Board may authorize an exception. In order to ensure this is implemented as intended, it may also be necessary to include total nitrogen and various forms of nitrogen (total inorganic nitrogen [TIN], total Kjeldahl nitrogen [TKN], etc.) to the same list.

- Delete current provision limiting the term of an exception to no more than 10 years. Add a new provision stating that when authorizing an exception, the term for the exception shall generally not exceed 10-years, however the Central Valley Water Board shall have the discretion to adopt an exception for up to 50 years if the applicant(s) can demonstrate that it is necessary to further the management goals of the Salt and Nitrate Control Program. The Central Valley Water Board will have the authority to reauthorize (renew) an exception for one or more additional terms, the length of which shall be determined by the Central Valley Water Board but may only exceed 50 years if the management practices under the exception is resulting in significant, measurable and continuing improvements in water quality. The authorization of an exception, or any reauthorization, shall require approval of the Central Valley Water Board, after notice and hearing. The Central Valley Water Board shall also have the authority to rescind the authorization of an exception when the applicant(s) are not complying with the terms and conditions that are part of the exception. Any rescission of an exception may only occur after notice and hearing.

  Other Options Considered:

  a) Establish a 50-year timeframe for achieving balance and restoration for both salt and nitrate. "Restoration" nitrate is defined by either: 1) 50 percent of MCL; 2) 75 percent of MCL; or 3) 100 percent of MCL.

b) Retain existing 10-year limit for exception term; exceptions can be renewed at 10-year intervals with no end date.

c) No 10-year limit on an exception term; instead the Board has the discretion to decide actual term.

- Those discharger(s) with authorized exceptions, in conjunction with Central Valley Water Board staff, should prepare a status report for presentation to the Central Valley Water Board every 5 years summarizing compliance with the terms and conditions of the exception. The Central Valley Water Board staff maintains discretion to present such status reports to the Central Valley Water Board for individual exceptions, or collectively for multiple exceptions granted to multiple dischargers.

- Clarify that nothing in the policy prevents the Central Valley Water Board from considering authorization of an exception for boron if adequate supporting documentation to justify the exception is provided by the applicant. This would include providing supplemental environmental review and analysis, where needed, to supplement such analyses completed to support development of the Salt and Nitrate Control Program.

- Clarify that exceptions are intended to facilitate long-term attainment of water quality standards under the Salt and Nitrate Control Program or to provide the time needed to revise an inappropriate water quality standard. Exceptions will only be considered under this program if the applicant is had documented actively participating the Salt and Nitrate Control Program and/or meets specific boron documentation requirements.

- Requirements associated with seeking and approving an exception include, but are not limited to: eligibility criteria, mitigation responsibilities, monitoring/reporting obligations, and expectations relevant to implementing the Salt and Nitrate Control Program goals.

  Other Option Considered: Also add in the following new conditions for obtaining an exception:

  - "Best Efforts" are to be provided[53].
  - Participation in a mitigation fund or other mitigation program that fully mitigates impacts to drinking water.
  - Long-term management plans show improved water quality trends over a 10 and 20-year horizon.
  - Participation in a program that restores the aquifer to meet water quality objectives within 50 years.

- As a condition for reauthorizing/renewing an exception, dischargers with authorized exceptions terms greater than ten years will be required to prepare and submit a report every ten years that reassess Best Management Practices (BMPs) and survey available

[53] The "best efforts" approach involves the Central Valley Water Board establishing limitations expected to be achieved using reasonable control measures. Factors which should be analyzed under the "best efforts" approach include the effluent quality achieved by other similarly situated dischargers, the good faith efforts of the discharger to limit the discharge of the constituent, and the measures necessary to achieve compliance. SWRCB Order WQ 81–5, at p. 7. The State Water Board has applied the "best efforts" factors in interpreting BPTC. (See State Water Board Order Nos. WQ 79–14, and WQ 2000–07).

treatment technologies to determine if feasible, practicable and reasonable compliance options have become available.

Other Option Considered: In addition to above, the following specific performance measures are a condition for renewing exceptions.

- Demonstration that aquifer restoration / mitigation projects have been effective and identification of additional actions, if needed.
- Long-term management plans show improved water quality trends over: 1) a 10- and 20-year horizon at first and second renewal; 2) a 20-year horizon at third and fourth renewals.
- Long-term management plans show salt/nitrate balance and restoration of aquifer to meet water quality objectives in as short a time as practicable, but not to exceed: 1) 40 years at first renewal, 2) 30 years at second renewal, 3) 20 years at third renewal, and 4) 10 years at fourth renewal.

- Where exceptions are sought in order to provide time to develop and approve a more appropriate water quality standard (uses and/or objectives), there must be a well–defined work plan (including a schedule of milestones) and a commitment by dischargers to provide the resources needed to complete the proposed process.

- Where existing water quality standards are unlikely to change, dischargers must explain how the proposed exception facilitates the larger long-term strategy designed to ultimately attain those standards while, in the interim, allocating available resources to address more urgent water quality priorities (e.g., safe drinking water), where applicable.

Exception Requirements Specific to Salinity

- Permittee must demonstrate full participation in the Alternative Salinity Permitting Approach proposed under the Salt Control Program

- An application seeking consideration of drought, water conservation, and/or water recycling as part of an exception to the implementation of water quality objectives for salinity must include a description of any drought impacts, irrigation, water conservation and/or water recycling efforts that may be causing or cause the concentration of salinity to increase in effluent, discharges to receiving waters, or in receiving waters.

  Other Option Considered: Under Phase I of the Salt Control Program, permittees are considered in compliance with salinity limits if they are meeting the Phase 1 Alternative Salinity Permitting Approach requirements, therefore an Exception is not required. A place holder noting this fact should be included in the Exception Policy which also notes that additional salinity conditions may be incorporated into the Exception Policy during Phase 2 and Phase 3 of the Salt Control Program.

Exception Requirements Specific to Nitrate

- Add a new provision requiring dischargers to ensure availability of an adequate supply of safe, reliable and affordable drinking water in those areas of the groundwater basin or sub-basin adversely affected by the non–compliant discharge (or discharges).

- An applicant's request for an exception shall include:

- An explanation/justification as to why the exception is necessary, and why the discharger is unable to ensure consistent compliance with existing effluent and/or groundwater/surface water limitations associated with nitrate at this time;
- A description of the alternative compliance project(s), Early Action Plan (EAP) or other implementation measures that the applicant will implement or participate in, consistent with the proposed Nitrate Control Program for individual or collective groups of dischargers.
- Copies of any documents prepared and certified by another state or local agency pursuant to Public Resources Code section 21080 et seq.; or, such documents as are necessary for the Central Valley Water Board to make its decision in compliance with Public Resources Code section 21080 et seq.
- A work plan to provide an interim and permanent water supply for any person living in the area adversely affected by the discharge under the requested nitrate exception. The water supply work plan shall include a schedule of milestones and a description of financial commitments to ensure completion of the interim and permanent water supply. Performance bonds may be required to ensure timely implementation.
- A detailed schedule with milestones of how the applicant will meet long-term goals of the Nitrate Control Program.

Option: In addition to above, the following specific performance measures are a condition for renewing exceptions.

- Demonstration that short-term drinking water solutions were effectively implemented.
- Demonstration that mitigation fund / alternative drinking water projects have been effective and identification of additional actions, if needed.

Exception Requirements Specific to Boron

Specific requirements similar to the Salt and Nitrate Control Program have not yet been developed for boron, therefore, requirements specific to boron discharges reflect those previously adopted for salinity discharges.

- The permittee will be required to prepare and implement a Boron Reduction Study Work Plan, or a boron based watershed management plan. A Boron Reduction Study Work Plan shall at a minimum include the following:
  - Data on current influent and effluent boron concentrations;
  - Identification of known boron sources;
  - Description of current plans to reduce/eliminate known boron sources;
  - Preliminary identification of other potential sources;
  - A proposed schedule for evaluating sources; and

- A proposed schedule for identifying and evaluating potential reduction, elimination, and prevention methods.

- A boron based watershed management plan shall at a minimum include the following:
  - A discussion of the physical conditions that affect surface water or groundwater in the management plan area, including land use maps, identification of potential sources of boron, baseline inventory of identified existing management practices in use, and a summary of available surface and/or groundwater quality data;
  - A management plan strategy that includes a description of current management practices being used to reduce or control known boron sources;
  - Monitoring methods;
  - Data evaluation; and,
  - A schedule for reporting management plan progress.
- A requirement to participate in the P&O Study and contribute to the development and implementation of the Salt and Nitrate Control Program.
- An application for an exception to the implementation of water quality objectives for boron under this Program must include the following:
  - An explanation/justification as to why the exception is necessary, and why the discharger is unable to ensure consistent compliance with existing effluent and/or groundwater/surface water limitations associated with boron constituents at this time;
  - A description of boron reduction/elimination measures that the discharger has undertaken as of the date of application, or a description of a salinity–based watershed management plan and progress of its implementation;
  - A description of any drought impacts, irrigation, water conservation and/or water recycling efforts that may be causing or cause the concentration of boron to increase in the effluent, discharges to receiving waters, or in receiving waters;
  - Copies of any documents prepared and certified by another state or local agency pursuant to Public Resources Code section 21080 et seq.; or, such documents as are necessary for the Central Valley Water Board to make its decision in compliance with Public Resources Code section 21080 et seq.
  - Documentation of the applicant's active participation in the long-term Salt Control Program as indicated by a letter of support from the entity managing the P&O Study.
  - A detailed plan of how the applicant will continue to participate in Salt Control Program and how the applicant will contribute to the development and implementation of the long-term management activities.

4.2.7.2 Evaluation

The Central Valley Water Board is required to implement the Basin Plans when it authorizes discharges through the adoption of Waste Discharge Requirements and Conditional Waivers

(WDRs/Conditional Waivers). This includes incorporating into the WDRs/Conditional Waivers provisions that ensure beneficial uses are protected, and that receiving waters meet or are better than water quality objectives that are adopted to protect beneficial uses. When permitting discharges, the Central Valley Water Board traditionally looks to see if the discharge itself meets (or is better than) the applicable water quality objective, and if not, determines if assimilative capacity is available in the receiving water. In cases where there is assimilative capacity, the Central Valley Water Board considers the particular facts of the discharge to determine whether if it can make the findings as required by the State Antidegradation Policy to authorize use of assimilative capacity.

In the Central Valley, there may be circumstances where the discharge is not better than the applicable water quality objective and no assimilative capacity is available, or the Central Valley Water Board is unable to make the findings necessary to authorize use of assimilative capacity even if it is available. Traditionally, in such circumstances, the State Water Board has directed that Central Valley Water Board either prohibit the discharge, adopt a time schedule in the order that requires the discharger to come into compliance with needed WDR provisions, or revise the applicable water quality standard.

Due to the extensive areas where groundwater concentrations already exceed applicable water quality objectives there may be instances where it is infeasible, impracticable or unreasonable for dischargers to comply with certain WDRs even with a compliance schedule. When there is little or no assimilative capacity available, the Central Valley Water Board presently has only two regulatory options available: (a) where appropriate, revise the applicable water quality standards and related WDRs, or (b) disallow the discharge.

To provide another alternative, the Central Valley Water Board adopted a Policy for Exceptions from Implementing Water Quality Objectives for Salinity (Exceptions Policy) in Resolution No. R5–2014–0074, on June 6, 2014. The State Water Board approved that policy in Resolution No. 2015–0010, on March 17, 2015. The Policy amended the Basin Plans and established "*procedures for dischargers that are subject to WDRs and conditional waivers to obtain a short-term exception from meeting effluent or groundwater limitations for salinity constituents."*[54]

The Exceptions Policy established a Salinity Exception Program that is *"in effect during the development and initial implementation of the Salt and Nitrate Management Plans"*[55] being prepared through the CV-SALTS process. The Salinity Exception Program (aka "Streamlined Policy") applies only to electrical conductivity, total dissolved solids, chloride, sulfate and sodium.[56] The current Exceptions Policy prohibits the Central Valley Water Board from authorizing new exceptions or reauthorizing previously approved exceptions after June 30, 2019. The sunset date was included because the Central Valley Water Board intended that any permanent, long-term exceptions policy should be developed through the CV-SALTS process and that stakeholders needed to make appropriate recommendations for such a policy in the SNMP.

Revising water quality standards (uses and or objectives) is a complex, timely process requiring considerable documentation and numerous opportunities for public comment. Consequently,

[54] Central Valley Water Board Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins and the Water Quality Control Plan for the Tulare Lake Basin To add Policies for Variances from Surface Water Quality Standards for Point Source Dischargers, Variance Program for Salinity, and Exception from Implementation of Water Quality Objectives for Salinity; Final Staff Report, June 2014, Final Staff Report ("Variance & Exceptions Policy"); page ES–3 (Central Valley Water Board, 2014).

[55] Variance & Exceptions Policy; page ES–3. (Central Valley Water Board, 2014)

[56] Variance & Exceptions Policy; page 51. (Central Valley Water Board, 2014)

legally allowing for an exception to meeting the objective may be needed to provide time to complete the full regulatory review and approval process for revising the water quality standard. Or, in many cases, the Central Valley Water Board will be reluctant to revise the water quality standard and would prefer to adopt an exception that is discharger and/or area specific and time-limited rather than a general and more lasting water quality standard revision.

Prohibiting the discharge may also be infeasible, impracticable or unreasonable. If the Central Valley Water Board determines that a non–compliant discharge cannot or should not be prohibited, then some form of exception is required. Examples of situations where the Central Valley Water Board may conclude that it is infeasible, impracticable or unreasonable to prohibit the non–compliant discharge include, but are not limited to:

1) Situations where compelling the discharge to comply with the applicable WDR (assuming it was possible to do so) would not significantly improve water quality or ensure attainment of the related standards in the foreseeable future (≈20 years).

   Other Option Considered: Delete this justification from the Salinity Exception Program.

2) Situations where allowing the discharge is likely to result in nominal but insignificant changes in receiving water quality with no meaningful increase in public health risk.

3) Situations where disallowing/prohibiting the discharge would likely result in widespread and substantial adverse social and economic impacts in the area and/or region.

4) Situations where allowing the discharge even though it is above an applicable objective is projected to improve existing or expected quality in the receiving water; or, where prohibiting the discharge would be more harmful to water quality and/or the environment than allowing it to continue despite the failure to comply with the WDR provisions for which the exception is sought.

5) Situations where allowing the discharge to continue is necessary to preserve or sustain other beneficial uses, or to implement other important water resource management policies established by state authorities (e.g., increased water conservation, increased use of recycled water, increased groundwater recharge/storage, increased drought protection, etc.).

6) Situations where allowing the discharge to continue facilitates the Salt and Nitrate Control Program's management goals for a more comprehensive long-term program to achieve salt and nitrate balance and, where reasonable and feasible, attain water quality standards in the groundwater (aka "restoration").

Other Options Considered: during the development of the proposed Basin Plan Amendments, the Board and stakeholders also considered the following elements that could be incorporated into the existing Exception Policy:

Limit exceptions to permit-by-permit application; do not authorize for a management zone: Although requirements of an authorized Exception would become part of individual permit provisions, restricting application to individual permits discourages broad-based, collaborative approaches to addressing groundwater quality conditions and is not consistent with the proposed Salt and Nitrate Control Program.

Appropriate Term Limits: An option to limit terms for Exceptions to a 50-year maximum, with no opportunity for renewal assumes that groundwater quality conditions will be

restored within the 50-year timeframe or that beneficial uses/water quality objectives will be revised within 50-years. The Aggressive Restoration Study (Luhdorff & Scalmanini and Larry Walker Associates, 2016b) documented the need for much longer time periods to restore nitrate conditions in a 200 square mile area to below 10 mg/L nitrate as nitrogen. Is some portions of the aquifer being modelled, nitrate concentrations continued to exceed 10 mg/L after 100-years. Conditions were improving, but the concentrations were still above those protective of drinking water. The current alternative to recommend 10-year term limits with ability to approve a 50-year term providing that review of the status of projects supporting the Exception be conduct every 5-years at a public hearing. Any renewal/extension past 50-years would require a finding that water quality conditions are showing continuing, measurable improvements and that conditions for provision of safe drinking water supplies (if necessary) have been met.

An option for unlimited renewals of 10-year terms places a large administrative burden on long-term efforts. An option to provide no guidelines on term limits has the potential to dilute expectations by not articulating specific goals that dischargers should strive for.

Include Additional Conditions for Obtaining an Exception: Most of the additional conditions proposed are incorporated as part of the intent of the exception (utilizing Best Efforts and management plans setting milestones to provide improved water quality trends). Some clarity in the language may be appropriate.

The option to require participation in a mitigation fund or other mitigation program appears duplicative and restrictive with the condition that exceptions for nitrate will not be considered unless an adequate supply of clean, safe, reliable and affordable drinking water is available for those living in the area adversely affected by the non–compliant discharge(s).

The option to participate in a program that restores the aquifer to meet water quality objectives within 50 years appears unrealistic for some areas in the valley due to current nitrate concentrations and limitations in treatment alternatives. The proposed alternative sets a goal of 50 years and provides the Central Valley Water Board the discretion to extend the Exception where there is significant, measurable and continuing improvements in water quality. The proposed alternative provides appropriate flexibility to address the diversity of conditions in the Central Valley.

Include Additional, Specific Performance Measures as a Condition for Renewing Exceptions: One of the proposed options (demonstration on the effectiveness of current practices and identification of additional actions if needed) are incorporated as part of the intent of the exception but clarity in the proposed language may be appropriate.

The two additional options for reporting periods both end at the 50-year mark and as such are unrealistic for the anticipated timeframes to address current nitrate conditions in groundwater.

4.2.7.3 Recommendation

Staff recommends the alternative to modify the existing Salinity Exception Program in the Basin Plans, grant exceptions for salinity constituents, nitrate and boron in non-NPDES program WDRs where it concludes that it is infeasible, impracticable or unreasonable to prohibit an otherwise non–compliant discharge to groundwater.

Staff also recommends that it is appropriate to include the following language under "Requirements Specific to Salinity" due to the proposed requirements under the Salt Control Program:

> *"Under Phase I of the Salt Control Program, permittees that are in compliance with the conditions for the Alternative Permitting Approach are in compliance with their salinity permit limits. Additional conditions for exceptions to water quality objectives for salinity under Phase II and Phase III of the Salt Control Program may be incorporated in the future."*

4.2.8 Drought and Conservation Policy

Extended periods of below normal precipitation (i.e., "droughts") as well as implementation of encouraged or mandated water conservation practices can increased TDS/EC and other salinity–related constituents in influent and effluent. This increase may be caused by one or more of the following conditions:

a) Higher Salinity Source Water. During droughts and for a period of time after a drought, there is generally less high quality surface water available and water agencies commonly increase their reliance on lower quality (higher TDS/EC) groundwater or recycled water sources to augment their water supply. Most municipal and some industrial wastewater treatment systems are not designed to remove TDS/EC. Consequently, higher salinity in the water supply tends to result in higher salinity in effluent.

b) Increase reuse reduces dilution. Encouraged and/or mandatory conservation measures undertaken in response to prolonged drought may significantly alter the behavior of water users (restricted lawn watering, shorter showers, larger laundry loads, less frequent flushing, less industrial water use, etc.). The cumulative effect of these behavioral changes combine to reduce water use, which previously helped dilute the average TDS/EC concentration in raw sewage and treated wastewater.

   Increasing TDS/EC is also caused by widespread adoption of high efficiency, low–flow fixtures and appliances and greater use of in–home water softening technologies that increase TDS/EC discharged to sewer systems.

Drought conditions create similar concerns for agricultural operators and other dischargers (e.g., food processors). Reduced availability of high quality (low TDS) surface water forces increased reliance on lower quality (high TDS/EC) sources to maintain crop yields or ensure long-term survival for vines and orchards, or to run operations. Periods of low rainfall reduce the flushing of salts from the root zone. The net result is temporarily higher TDS/EC concentrations recharging to groundwater below the root zone. For land discharge application, similar concerns exist.

Once water conservation practices are implemented, they are likely to continue, especially if they necessitated capital investment (i.e. redirection for landscape irrigation, low flush toilets, drip irrigation, etc.).

With Climate Change and continued increasing demands on limited water supplies, conservation and reuse are encouraged throughout the Central Valley. Drought exacerbates salinity increases already occurring due to increased reuse.

The alternative discussed in this section evaluate whether a Drought and Conservation Policy to account for these increased salinity concentrations should be incorporated into the Basin Plans.

4.2.8.1 Alternatives

Three alternatives were identified: 1) No Action Alternative; 2) Incorporate a Drought and Conservation Policy into the Basin Plans; and 3) Revise the Drought and Conservation Policy as part of the Prioritization and Optimization Study and incorporate under Phase 2 of the Salt Control Program. For the second alternative, options to some of the elements were also identified by stakeholders and are included in the discussion.

4.2.8.1.1 No Action Alternative

Under current Basin Plan provisions, permits may include restrictions on the salt concentration in the final effluent or in treated municipal wastewater based on one of the following:

a) The applicable narrative or numeric water quality objective;

b) High quality receiving water;

c) Maximum allowable increase in Total Dissolved Solids (TDS) compared to the average salinity concentration in the water supply source; or

d) Best demonstrated performance using representative historical discharge data.

Permits rarely include any special provision or consideration for variations in effluent quality, directly or indirectly related to recurrent drought conditions or for ongoing, expanding and sometimes mandated conservation practices unless those provisions have been specifically adopted as part of the implementation provisions for a control program (e.g. the Control Program for Salt and Boron Discharges into the Lower San Joaquin River). In addition, the occasions when discharge quality is substantially better than required are not usually considered when assessing whether that discharge is causing or contributing to an exceedance of water quality objectives in groundwater that has a longer water quality “memory” than a flowing stream.

4.2.8.1.2 Alternative to Incorporate a Drought and Conservation Policy

This alternative is to provide interim salinity limits during specific emergency situations when source water quality can be expected to decrease (e.g. declared droughts) and/or to account for documented and continuing conservation practices. The interim limits are based both on the short-term secondary Maximum Contaminant Levels identified in Title 22 for short term drinking water supply and historical salt load in the effluent as follows.

Other Option Considered*:*

- *Establish a temporary variance/exception from salinity–related water quality objectives during certain drought conditions rather than an interim limit.*
- *Set the interim limit to the Upper Salinity Concentration under SMCLs (1600 µS/cm).*
- *Include boron as one of the constituents under the Drought and Conservation Policy.*

Unless otherwise excluded based on requirements of the Salt Control Program, a permittee (or third party group on behalf of collective dischargers) may qualify for interim permit limits for salinity under one or more of the following conditions:

a) A drought emergency is declared by an authorized federal or state authority, as defined by the California Emergency Services Act;
b) A local drought emergency or other emergency is declared, consistent with the California Emergency Services Act that impacts availability of water supplies; or
c) Water conservation and/or water recycling efforts may be causing or cause the concentration of salinity to increase in the effluent, discharges to receiving waters, or in receiving waters.

Other Option Considered: *Include a condition for Extended Dry Periods similar to the conditions adopted as part of the Basin Plan Amendment case study to adopt salinity objectives in the Lower San Joaquin River upstream of Vernalis (Resolution R5–2017–0062). Provisions would allow an extension of interim permit limits one year after extended dry periods to allow flushing of salt from the root zone.*

During Statewide or Local Drought or Other Emergencies that Limit Water Supplies

Dischargers (or third party group on behalf of collective dischargers) shall receive interim effluent and/or groundwater/surface water limitations based on their historical salinity load (with consideration given to reasonable increment of use or changes in source water salinity concentration) and shall not exceed an EC concentration of 2,200 µS/cm as a 30–day running average. The water quality–based effluent/groundwater/surface water limitations may be established in terms of EC concentration or total dissolved solids (TDS) loading, however, concentration and loading limits shall not be applied at the same time. An EC to TDS ratio of 0.64 shall be used to convert the EC concentrations to TDS concentrations, unless a discharge–specific ratio can be demonstrated. The Central Valley Water Board has the discretion to adjust these limitations based on local conditions including but not limited to local beneficial use protection and site–specific salinity objectives. The interim effluent and/or groundwater/surface water limitations will remain in effect during the time period when one or more of the conditions noted in a or b, above, are met.

Limitations to Account for Water Conservation and Recycling Efforts

A discharger (or third party group on behalf of collective dischargers) may qualify for interim permit limits for salinity by submitting documentation that water conservation and/or water recycling efforts cause the concentration of salinity to increase in the effluent, discharges to receiving waters, or in receiving waters. Interim permit limits will be based on one of the

following.

a) Dischargers (or third party group on behalf of collective dischargers) who demonstrate that their permitted discharges have a lower salinity concentration than the receiving water salinity concentration shall receive interim effluent and/or groundwater/surface water limitations that do not exceed the receiving water salinity concentration, provided there are no unreasonable impacts to downstream/downgradient water quality.

b) The remaining dischargers (or third party group on behalf of collective dischargers) shall receive interim effluent and/or groundwater/surface water limitations based on TDS loading consistent with their historical load (with consideration given to reasonable increment of use or changes in source water salinity concentration) and shall not exceed an EC concentration of 2,200 µS/cm as a 30–day running average. An EC to TDS ratio of 0.64 shall be used to convert the EC concentrations to TDS concentrations, unless a discharge–specific ratio can be demonstrated. The Central Valley Water Board has the discretion to adjust these limitations based on other considerations such as local beneficial uses and site–specific salinity objectives.

Long Term Waste Discharge Requirements and Limitations for Groundwater

Dischargers to groundwater who submit documentation describing a long-term commitment (20 year planning horizon) to water conservation and/or water recycling efforts may be eligible to use a long-term (10+ year) flow–weighted average to calculate compliance with effluent and/or groundwater limitations when it can be demonstrated using recharge models and long-term precipitation estimates that applicable narrative or numeric salinity objectives can be met in the receiving water over the term of the compliance period. Periodic reassessments based on the best available data need to be conducted every five years unless otherwise directed in the waste discharge requirements to ensure that salinity objectives will be met and beneficial uses are protected.

Other Options Considered:

- *Conduct periodic assessment every 10 years.*
- *Authorize the use of "Offset Projects," particularly increased storm water capture and recharge, to demonstrate compliance with WDRs governing salinity discharges. Allow offset credits to be created and banked by constructing and operating such projects or by discharging well below the WDR threshold in non–drought years. Recognize that the credits needed to achieve compliance during periods of drought normally must be generated at times of above normal precipitation (especially El Niño winters) and, as such, must remain valid for at least 10 years.*
- *Explore the possibility to consider offsets credits during the P&O Study.*

4.2.8.1.3 Alternative to Further Review the Drought and Conservation Policy as Part of the Prioritization and Optimization Study under the Salt Control Program

Under this alternative, the proposed Drought and Conservation Policy would not be incorporated into the Basin Plan at this time but would be further reviewed as part of the Prioritization and Optimization Study under the proposed Salt Control Program. The review would include an evaluation of use of Extended Dry Periods.

4.2.8.2 Evaluation

During emergencies such as drought, high quality water supplies diminish. Climate change is also anticipated to diminish available water supplies. Water conservation and water recycling can stretch limited water supplies, providing benefits to the people of the state. Conservation and recycling has the unintended consequence of creating compliance issues due to increased concentrations of constituents, such as salinity in discharges. It is the intent of the Central Valley Water Board to encourage conservation and water resource management.

Under the No Action Alternative, no provisions would be incorporated into the Basin Plans. Dischargers would continue to face potential noncompliance with permit provisions for variations in effluent quality directly or indirectly related to recurrent drought conditions that are beyond the control of the permittee. Similarly, the permittee may also be out of compliance for ongoing, expanding, encouraged and sometimes mandated conservation practices. Inability to ensure consistent permit compliance for salinity discourages conservation and reuse including the routine use of water for landscape or crop irrigation. This problem is compounded by the fact that standard permit requirements for TDS may be evaluated instantaneously or using relatively short-term averaging periods (e.g., daily, weekly, monthly averages or means). Since droughts typically persist for several years, even limits expressed as an annual average may be impractical to meet given the elevated salinity concentrations in the best available water supplies at such times.

The purpose of Alternative 2 is to provide for permitting procedures to be applied to account for conditions associated with the loss of higher quality water supplies such as drought and climate change, and/or constituent increases directly related to voluntary and/or mandatory conservation measures and increased recycling efforts. The interim limits are based on Title 22 secondary MCLs to protect short term drinking water supplies based on poor supply water quality and/or limits the salt load that may be discharged if conservation practices are documented. The Title 22 limit provide drinking water protection for short term periods. The limits on salt load would be consistent with effective conservation practices where reuse is concentrating but not added to existing salt in the original volume of water. Some accounting for changing source water supplies is acknowledged. Some options to the various elements for Alternative 2 are discussed below.

> *Establish a temporary variance/exception from salinity–related water quality objectives during certain drought conditions rather than an interim limit.* Although a legal alternative, developing variance and exception conditions are duplicative administrative layers that results in the application of interim effluent limits. Developing an over–arching policy that deals directly with the conditions resulting from drought and documented conservation and reuse activities more directly addresses the salinity concerns.
>
> *Set the interim salinity concentration limit to the Upper SMCL of 1,600 µS/cm.* Maintaining the best water quality reasonable, feasible and practicable continues to apply under the proposed drought and conservation policy. The range in salinity concentrations to the Upper SMCL of 1,600 µS/cm is proposed as appropriate under "normal" hydrologic conditions for the protection of municipal and domestic supply with a goal of the recommended SMCL of 900 µS/cm. The SMCL of 2,200 µS/cm is specifically recognized in Title 22 as protective of short term drinking water supplies when source water quality is impacted and is more appropriate under drought conditions.

Include boron as one of the constituents under the Drought and Conservation Policy. No additional studies have been conducted to determine appropriate interim limits for boron under drought or conservation/reuse conditions. Therefore, it is inappropriate at this time to include boron in the proposed policy.

*Include a condition for Extended Dry Periods similar to the conditions adopted as part of the Basin Plan Amendment case study to adopt salinity objectives in the Lower San Joaquin River upstream of Vernalis (Resolution R5–*2017–0062). *Provisions would allow an extension of interim permit limits one year after extended dry periods to allow flushing of salt from the root zone*. The Basin Plan Amendment for the Lower San Joaquin River was completed with full Substitute Environmental Justification to support the proposed Extended Dry Period provisions. The documentation included an extensive review of water quality conditions within different reaches of the Lower San Joaquin River upstream of Vernalis during different water year types (Wet, Above Normal, Below Normal, Dry and Critical) as determined from the San Joaquin Water Year Index (State Water Board, 2000) in order to determine a pattern of extended dry periods and document the flushing of salt during the first year after the dry period. While a similar index exists for the Sacramento River Basin, similar evaluation of historical water quality conditions has not been conducted. A water year type index does not exist for the Tulare Lake Basin. Therefore, it is inappropriate at this time to include an Extended Dry Period condition in the proposed policy.

Conduct periodic assessment of groundwater conditions every 10-years (when utilizing option for long-term flow–weighted averages to calculate compliance). The current proposal recommended a five year term "unless otherwise directed in the waste discharge requirements". Changes to groundwater conditions over time are dependent on the numerable variabilities of each aquifers hydrologic characteristics. While groundwater conditions in general may not change rapidly, some flexibility in permit conditions is appropriate to account for local variability. Setting a specific 10-year assessment approach is too limiting given inherent potential variability.

Authorize the use of "Offset Projects," particularly increased storm water capture and recharge, to demonstrate compliance with WDRs governing salinity discharges. Allow offset credits to be created and banked by constructing and operating such projects or by discharging well below the WDR threshold in non–drought years. Recognize that the credits needed to achieve compliance during periods of drought normally must be generated at times of above normal precipitation (especially El Niño winters) and, as such, must remain valid for at least 10 years. This proposed policy authorization is consistent with the goal of recognizing the long-term memory of groundwater, variability in water year types, and potential mutual benefits in coordinated recharge projects. However, no case studies have been identified to frame potential constraints or guidelines for such projects based on environmental and antidegradation considerations. Therefore, it is inappropriate at this time to include Offsets credits as part of the proposed policy.

Explore the possibility to consider offsets credits during the P&O Study. See Alternative 3.

The third alternative identified is to postpone adopting a Drought and Conservation Policy until it can be further studied and vetted as part of the P&O Study under the Phase I Salt Control

Program. A risk with such a delay is that should the P&O Study be delayed or terminated, permittees would continue to be unable to comply with salinity limits during drought conditions or if pursuing conservation or reuse. A benefit is that the current proposed conditions could be further vetted and could include review of the addition of boron, extended dry periods, and offset credits. NPDES permittees would need to individually explore options for a variance to meeting water quality objectives for salinity while other permittees would need to apply for exceptions to water quality objectives for salinity until a Drought and Conservation Policy was in effect.

4.2.8.3 Recommendation

Staff recommends Alternative 2 – Incorporate a Drought and Conservation Policy. The alternative provides focused authority for the Central Valley Water Board to recognize impacts from Climate Change and drought and encourage conservation and reuse of limited freshwater supplies. Staff also recommended that the proposed P&O Study under the Salt Control Program include a review of:

- Use of Extended Dry Periods in the Sacramento River and Tulare Lake Basins;
- Inclusion of boron as one of the constituents under the policy; and
- Use of Offset Credits.

4.2.9 Offsets Policy

An offset is an alternative means of achieving compliance with permit requirements to achieve compliance with water quality objectives, either alone or in combination with other actions, for a given pollutant or pollutants that may be authorized by the Central Valley Water Board. An offset allows for the management of sources and loads of the constituent of concern (not directly associated with the regulated discharge) so that the combined net effect on receiving water quality from the discharge and the offset is functionally-equivalent to or better than that which would have occurred by requiring the discharger to comply with its WDR at the point-of-discharge.

The alternatives below evaluate whether providing the Central Valley Water Board the authority to permit offset project for salt or nitrate appropriately support the proposed Salt and Nitrate Control Program. The alternatives are focused on use of offsets for discharges to groundwater. In this regard, an offset project must be located within the same groundwater basin/sub-basin or management zone as the regulated discharge.

4.2.9.1 Alternatives

Two Alternatives were identified: 1) No Action Alternative; and 2) Incorporate an Offsets Policy for Salt and Nitrate.

4.2.9.1.1 No Action

The Basin Plans do not authorize the Central Valley Water board to consider offsets when evaluating compliance. If such authority is added to the Basin Plans, the Board must take a separate action, through the normal public notice and hearing process, to consider and approve any proposed offset. Should a permittee seek compliance for a discharge into a groundwater basin that does not have available assimilative capacity, the discharger would need to either meet applicable water quality objectives or meet obligations under a time schedule order to demonstrate improvements until water quality objectives are met.

4.2.9.1.2 Incorporate an Offset Policy for Salt and Nitrate Discharges to Groundwater

Overview

This alternative proposes to amend the Basin Plans to allow the use of offsets for discharges of salt and nitrate to groundwater. Offsets would provide an indirect approach to partial or complete compliance with a WDR/conditional waiver requirement for a given pollutant by managing other sources and loads so that the net effect on receiving water quality from all known sources is functionally–equivalent to or better than that which would have occurred through direct compliance with the WDR at the point-of-discharge. Authorization to allow use of offsets would provide:

- A mechanism to re–allocate the resources required to achieve compliance in order to produce greater public benefits (e.g., better net water quality, lower cost, less risk).
- A mechanism whereby diverse dischargers within the same management zone can pool available resources to implement alternative compliance projects, in phases, on a risk–priority basis.
- A mechanism to develop and fund large-scale, long-term regional water quality improvement projects by recognizing participation in such efforts as partial credit toward compliance.
- Market–based incentives to establish a mitigation fund designed to develop and implement water quality improvement projects, which are useful for pooling resources of relatively small dischargers into a critical funding mass to support projects that would normally be beyond their individual means.

4.2.9.1.3 Alternative 2

An offset project proposed for nitrate or salt discharges should be located within the same groundwater basin/sub-basin or management zone as the regulated discharge and is applicable to groundwater only. Application for an offset may be submitted by individual dischargers, or collective dischargers within a management zone, by a third party group on behalf of its members, or other forms of collective groups of dischargers recognized by the Central Valley Water Board. The decision to pursue an offset is voluntary. Offsets must be:

(1) Proposed by the permittee[57] as an Alternative Compliance Project (ACP)[58]

(2) Approved by the Central Valley Water Board; and

(3) Enforceable through a WDR or other orders issued by the Board.

The following requirements apply to all offsets:

[57] Throughout this document the term "permittee" can connote either an individual discharger or a coalition of dischargers regulated under a common set of categorical WDRs or watershed/groundwater basin/sub-basin permit or order, or dischargers working collaboratively within a management zone.

[58] See Attachment A-10 of the SNMP for guidance on development of an ACP project.

(1) Where an offset project is being considered for implementation, it should be consistent with any local implementation plans established to manage salinity or nitrate concentrations in the same area. And, in general, it is desirable to encourage offsets in the same groundwater basin/sub-basin where the discharge occurs. However, offsets may also be used to incentivize implementation of some large-scale projects such as a regional regulated brine line or establish a mitigation fund to provide safe drinking water, provided that the offsets still result in a positive net effect on receiving water quality.

Options:

- *Offsets should only apply within the immediate area of the discharge's contribution.*
- *Nitrate mitigation fund cannot be considered an "offset" if it does not result in groundwater quality improvements.*

(2) When there is no assimilative capacity available in the receiving water, the offset shall result in a net improvement in existing water quality (e.g., the offset ratio must be > 1:1) compared to baseline regulatory requirements. (Offset ratios < 1:1 may be authorized only in accordance with the state's antidegradation policy unless an exception is granted or Time Schedule Order or Compliance Schedule Order allows a less stringent interim ratio to apply.)

(3) Offsets shall be for substantially the same pollutant. Cross-pollutant trading to address nitrate impairments (e.g., TDS for nitrate, nitrate for arsenic, etc.) is not authorized under this policy.

(4) The proposed package (discharge + offset project) cannot result in unmitigated localized impairments (e.g., "hotspots") to sensitive areas (especially drinking water supply wells) or have a disproportionate impact on a disadvantaged community in the sub-basin. Downgradient well owners shall be notified and encouraged to participate in the offset approval process.

(5) Offsets shall be approved by the Central Valley Water Board. The Board may elect to approve a specific offset projects (a 1-step process) through the issuance of a permit, or the Board may generally authorize the use of offsets in a permit and subsequently approve individual offset projects in subsequent Board actions (e.g., a 2-step procedure).

(6) Offsets shall apply to a specific discharge for a defined period. Offsets may be renewed but must be periodically reviewed and reauthorized by the Central Valley Water Board. The length of that period will be specified by the Central Valley Water Board when the offset is approved.

(7) The terms and conditions governing an approved offset shall specify the remedial actions that must be undertaken by the discharger, and the metric(s) used to trigger such obligations, in the event that the offset project fails.

(8) The offset project shall include a monitoring and reporting program sufficient to verify that the pollution reduction credits are actually being generated as projected and that these credits are adequate to offset the discharge loads in the ratio approved by the Central Valley Water Board. Pollutant removal, reduction, neutralization, transformation,

dilution through recharge and support of a mitigation fund may all be acceptable means of generating offset credits (subject to appropriate verification).

When authorizing an offset, the Central Valley Water Board shall consider the following conditions:

(1) When it is not feasible, practicable or reasonable for the discharge to comply directly with applicable WDRs.

(2) When it is not feasible, practicable or reasonable to prohibit a discharge that is unable to comply with applicable WDRs.

(3) When there is no assimilative capacity available in the receiving water or as a condition for allocating any available assimilative capacity in order to authorize a discharge.

(4) When the net effect of authorizing the discharge, including the proposed offset project, would result in better water quality in the groundwater basin/sub-basin or better support beneficial use attainment than is likely to occur if the discharge was required to comply with the applicable WDRs at the point-of-discharge.

(5) When the proposed offset project will provide substantially greater and more immediate public health protection than is expected to result if the discharger was required to comply with the applicable WDRs at the point-of-discharge or the non-compliant discharge was prohibited completely.

(6) When the proposed offset project is an integral part of and facilitates a larger strategic plan or project designed to ultimately achieve attainment of water quality standards or restoration of a water body.

(7) Other factors such as the: relative location of the discharge and offset project and potential impacts on downgradient waters, reliability of the recharge, the extent that a groundwater recharge project puts more 'clean' water in the aquifer than what would occur without the project, impacts on the vadose zone over time, mixing assumptions, brine disposal, and whether the offset is proposed as a temporary or permanent alternate compliance strategy.

Within a reasonable time period after determining that the proposed offset application is complete, the Central Valley Water Board shall provide notice, request comment, and schedule and hold a public hearing on the application within a timely manner. The notice and hearing requirements shall comply with those set forth in Water Code section 13167.5. The offset shall be issued through a resolution or special order that amends applicable waste discharge requirements and/or conditional waiver requirements.

4.2.9.2 Evaluation

Based on the evaluation of ambient groundwater concentrations conducted throughout the Central Valley (Larry Walker Associates, 2013) broad expanses of groundwater underlying permittees already exceed salinity and nitrate water quality objectives to protect beneficial uses. In these area, permittees are currently restricted to individual time schedule order to ensure the discharge meets water quality limits or the discharge will be prohibited. The current no action alternative does not provide a mechanism for dischargers to collaborate and support the major management projects to balance salt and nitrate loading and lead to

restoration. Permittees would be required to continue to focus on the immediate impacts of their own discharge.

Alternative 2 recommends that the Basin Plans be amended to provide authority for the Central Valley Water Board to allow the use of offset projects to comply with WDRs, but only for groundwater. The offsets may be proposed to support a request for either an allocation of available assimilative capacity or an exception. Offsets must be (1) proposed by discharger (individual or group of dischargers); (2) approved by the Central Valley Water Board; and (3) enforceable through a WDR or other orders issued by the Board. One major goal of the offset policy is to allow pooling resources of many relatively small dischargers into a critical mass of funding to support water quality projects that would normally be beyond the means of individual dischargers to fund. As proposed, the Offsets Policy would provide:

- A regulatory alternative, other than prohibiting the discharge or issuing an exception, when it is infeasible, impracticable or unreasonable to require compliance with WDRs directly. Offsets are an Alternate Compliance Project under the proposed Salt and Nitrate Control Program that may be proposed to support a request for either an allocation of available assimilative capacity or an exception.
- A method for permitting discharges with pollutant concentrations greater than the objective or higher than the current receiving water quality. They potentially can provide better overall improvement, result in less degradation in that receiving water basin, sub-basin or management zone, or further other societal priorities such as more immediate provision of safe drinking water supplies.
- A mechanism whereby diverse dischargers within the same management zone can pool available resources to implement management activities, in phases, on a risk–priority basis. The option to pool resources creates a strong incentive to establish such management zones.
- A mechanism to develop and fund large–scale, long-term regional water quality improvement projects such as described by the Strategic Salt Accumulation Land and Transportation Study (SSALTS)[59] or the Nitrate Implementation Measures Study (NIMS)[60] by recognizing participation in such efforts as partial credit toward compliance.
- A market–based incentive to establish a mitigation fund designed to develop and implement water quality improvement projects within the same receiving water basin where the discharge occurs. Funds paid into a mitigation fund as an offset must be used within the same receiving water basin, sub-basin or management zone where the discharge occurs.
- Creative solutions to complex problems by measuring success at the most critical endpoint: Net effect of water quality on end–uses. This outcome–oriented approach is consistent with the primary purpose for imposing water quality standards–based permit requirements, i.e., to protect beneficial uses.

[59] *Strategic Salt Accumulation Land and Transportation Study (SSALTS), Final Phase 2 Report: Development of Potential Salt Management Strategies*. Report prepared by CDM Smith on behalf of CV-SALTS. October 1, 2014; *SSALTS, Final Phase 1 Report: Identification and Characterization of Existing Salt Accumulation Areas*. Report prepared by CDM Smith on behalf of CV-SALTS. December 13, 2013. (CDM Smith, 2013)

[60] *Nitrate Implementation Measures Study (NIMS) Final Report*. Report prepared by CDM Smith on behalf of CV-SALTS, March 31, 2016 (CDM Smith, 2016a)

Where an allocation of assimilative capacity is sought, implementing an offset project may be the best practicable treatment or control that is most consistent with maximum benefit to the people of the state. This is particularly true where the net effect on receiving water quality and/or end users is better than would otherwise occur by requiring strict compliance with water quality standards at the point of discharge.

Where there is no assimilative capacity available, or the Central Valley Water Board is unwilling to allocate the available assimilative capacity,[61] the discharger may need to apply for an exception. Because offsets can be used to minimize the net negative affect on receiving water quality, the proposed offset project may be included as a condition for authorizing the exception for the non–compliant discharge. In such cases, the offset program may be used to help demonstrate that the discharger is making "reasonable progress" at mitigating excess pollutant loads where feasible and practicable.

Although offset projects may be proposed for any type of discharge, they would be most useful to implement more cost–effective water quality control strategies where the Central Valley Water Board has elected to "prescribe general waste discharge requirements for a category of discharges"[62]. Offsets may offer the opportunity to focus and simplify monitoring and reporting requirements so that resources can be redirected to accelerate or expand water quality improvement projects.

To support this alternative, it may be appropriate to establish a mitigation fund designed to develop and implement water quality improvement projects within the same receiving water basin, sub-basin or management zone where the discharge occurs.

Two options were identified for elements of Alternative 2: restricting use to immediate area of discharge contribution; and not allowing use of a mitigation fund if it does not result in groundwater quality improvement.

> *Offsets should only apply within the immediate area of the discharge's contribution.* An offset project is designed to provide greater water quality improvements than would be attained by restricting improvements to the discharge itself. While such offsets projects may be appropriate in some cases (such as developing a stormwater recapture system within the discharge contribution area), limiting use to this extent returns regulation to a permit-by-permit approach and reduces incentive for multiple dischargers to pool resources for the large–scale, long-term regional water quality improvement projects.
> *Nitrate mitigation fund cannot be considered an "offset" if it does not result in groundwater quality improvements.* An offset is traditionally based on conducting activities in other portions of a receiving water body that provides for overall improved water quality. This option focuses directly on that component of an offset project. Under the proposed Salt and Nitrate Control Program, the highest management priority is to ensure safe drinking water supplies. While use of a mitigation fund to provide safe drinking water supplies is appropriate under the program for the short-term, participation in the fund should not be considered an "offset" unless the project includes long-term improvements in the impacted water body.

[61] Wat. Code, § 13263, subd. (b).

[62] Wat. Code, § 13263, subd. (i).; examples: WDRs issued to the dairy industry or various agricultural coalitions.

4.2.9.3 Recommendation

Staff recommends incorporating the proposed Offset Policy into the Basin Plans in order to provide the Central Valley Water Board the authority to allow permittees to collaborate and pool funds to develop and implement long-term, large–scale, regional water quality improvement projects.

The proposed Offsets Policy appropriately prevents an offset project from being approved if it would result in unmitigated localized impairments to sensitive areas (especially drinking water supply wells or have a disproportionate impact on a disadvantaged community, including a requirement that downgradient well owners be notified and encouraged to participate in any offset approval process.

The current proposed alternative should be revised to clarify that use of a mitigation fund to provide safe drinking water supplies does not in itself satisfy requirements of an offset project. The overall project funded through the mitigation fund must also address long-term improvements to the impacted water body in order to qualify.

The evaluation of use of offsets for salt in surface water should be evaluated as part of the P&O Study.

4.2.10 Secondary Maximum Contaminant Level (SMCL) Clarification

Secondary Maximum Contaminant Levels (SMCLs) are secondary drinking water standards. The California Health and Safety Code defines secondary drinking water standards as:

> "…standards that specify maximum contaminant levels that, in the judgment of the department, are necessary to protect the public welfare. Secondary drinking water standards may apply to any contaminant in drinking water that may adversely affect the odor or appearance of the water and may cause a substantial number of persons served by the public water system to discontinue its use, or that may otherwise adversely affect the public welfare. Regulations establishing secondary drinking water standards may vary according to geographic and other circumstances and may apply to any contaminant in drinking water that adversely affects the taste, odor, or appearance of the water when the standards are necessary to ensure a supply of pure, wholesome, and potable water."[63]

SMCLs established by the California Code of Regulations, Title 22 (Title 22)[64] (the secondary drinking water standards regulations) are incorporated by reference in the Chemical Constituent sections in the Water Quality Objectives Chapter of both Basin Plans. The only portions of Title 22 related to SMCLs and incorporated into the Basin Plans are Tables 64449–A and 64449–B. Table 64449–B includes "Recommended", "Upper", and "Short Term" concentrations for Total Dissolved Solids (TDS) or Specific Conductance (or Electrical Conductivity [EC]), chloride and sulfate. The SMCLs were included in the Basin Plans for the purpose of protecting drinking water use, however, neither the text providing context for the tables nor guidance for utilizing the applicable "Recommended", "Upper", or "Short Term" concentrations were explicitly included when the Title 22 tables were adopted as water quality objectives.

[63] Health & Saf. Code, § 116275, subd. (d).

[64] Cal. Code Regs., tit. 22, § 64449 et seq.

The alternatives discussed in this section evaluate whether it is appropriate to provide clarification in the Basin Plans on how SMCLs are to be interpreted as water quality objectives as well as how such objectives should be implemented when determining compliance. In general, there are two types of SMCLs being evaluated: those associated with salinity (e.g., TDS or EC) in Table 64449–B, and those associated with other types of constituents (e.g., organics, metals, and other general constituents) in Table 64449–A.

4.2.10.1 Alternatives

Two alternatives were identified: 1) No Action; and 2) Provide Clarification on SMCLs as Water Quality Objectives and Their Use. Options to elements contained in Alternative 2 were identified and are discussed as part of the evaluation.

4.2.10.1.1 No Action

Chemical Constituents Water Quality Objective

The Central Valley Basin Plans state the following with regards to chemical constituents and the protection of surface and ground waters designated with a Municipal and Domestic Supply (MUN) beneficial use:[65]

> *At a minimum, water designated…MUN shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCLs) specified in the following provisions of Title 22 of the California Code of Regulations, which are incorporated by reference into this plan: Tables 64431–A (Inorganic Chemicals) and 64431–B (Fluoride) of Section 64431, Table 64444–A (Organic Chemicals) of Section 64444, and Tables 64449–A (Secondary Maximum Contaminant Levels–Consumer Acceptance Limits) and 64449–B (Secondary Maximum Contaminant Levels–Ranges) of Section 64449. This incorporation–by–reference is prospective, including future changes to the incorporated provisions as the changes take effect...The Regional Water Board acknowledges that specific treatment requirements are imposed by state and federal drinking water regulations on the consumption of surface waters under specific circumstances. To protect all beneficial uses the Central Valley Water Board may apply limits more stringent than MCLs.*[66]

The above referenced SMCL tables, Tables 64449–A and 64449–B from Title 22 are provided below. These tables list the chemical constituents along with their respective maximum contaminant levels for Table 64449–A or “Recommended”, “Upper”, and “Short Term” level ranges for Table 64449–B.

[65] (a) Water Quality Control Plan for the Sacramento River and San Joaquin River Basins (SRSJR Basin Plan). Fourth Edition. Central Valley Water Quality Control Board. Revised October 2011. See p. III–3.00 for inland waters and p. III–10.00 for groundwater; (b) Water Quality Control Plan for the Tulare Lake Basin (TLB Basin Plan). Second Edition. Central Valley Water Quality Control Board. Revised October 2011. See p. III–3 for inland waters and p. III–7 for groundwater.

[66] The last sentence regarding consumption of surface waters is found only in the Chemical Constituent water quality objectives section for inland waters.

Table 64449–A – Secondary Maximum Contaminant Levels; "Consumer Acceptance Contaminant Levels"

Constituents	Maximum Contaminant Levels/Units
Aluminum	0.2 mg/L
Color	15 Units
Copper	1.0 mg/L
Foaming Agents (MBAS)	0.5 mg/L
Iron	0.3 mg/L
Manganese	0.05 mg/L
Methyl–*tert*–butyl ether (MTBE)	0.005 mg/L
Odor – Threshold	3 Units
Silver	0.1 mg/L
Thiobencarb	0.001 mg/L
Turbidity	5 Units
Zinc	5.0 mg/L

Table 64449–B – Secondary Maximum Contaminant Levels; "Consumer Acceptance Contaminant Level Ranges"

Constituents, Units	Recommended	Upper	Short Term
Total Dissolved Solids (TDS), mg/L, or	500	1,000	1,500
Specific Conductance, µS/cm[67]	900	1,600	2,200
Chloride, mg/L	250	500	600
Sulfate, mg/L	250	500	600

Although the Title 22 § 64449 tables are referenced in the Central Valley Basin Plans, all of the associated text, which provides context for implementing the tabular values, is not currently included or referenced in the Basin Plans. Appendix F provides the full text of § 64449. Additionally, for surface waters, text in the Basin Plans as provided above references the applicability of state and federal drinking water regulations to water served for human consumption, but provides no guidance on how such regulations may influence the application of numeric values from the tables.

Other Relevant Regulatory Requirements

Natural Background Concentrations

Consideration of the natural background concentration of a constituent relative to a water quality objective is addressed in each Basin Plan as follows:

[67] For the purposes of this discussion, Specific Conductance is expressed as Electrical Conductivity.

- The TLB Basin Plan states that, "*The objectives of this plan do not require improvement over naturally occurring background concentrations."*[68] This finding applies to both inland surface water and groundwater quality objectives.[69]
- The SRSJR Basin Plan states that, "*These objectives do not require improvement over naturally occurring background concentrations.*"[70]
- Both the SRSJR and TLB Basin Plans include the following text within Chapter 4 of the Basin Plans (Policy for Application of Water Quality Objectives): *However, the water quality objectives do not require improvement over naturally occurring background concentrations. In cases where the natural background concentration of a particular constituent exceeds an applicable water quality objective, the natural background concentration will be considered to comply with the objective*.[71]

Per the above Basin Plan statements, natural background should be considered when establishing WDRs. No additional guidance is provided on choosing the appropriate SMCL from the range provided, compliance timeframe or sample type (e.g. total or dissolved).

4.2.10.1.2 Alternative to Provide Additional Clarity on the Use of SMCLs

The proposed alternative clarifies implementation of SMCLs in permits for discharge to surface water and groundwater. These recommendations include:

- Clarifying the use of "Recommended", "Upper", or "Short Term" concentrations included in Title 22 tables and adopted as water quality objectives.
- Clarification on sample type (filtered or dissolved) and compliance time period (averaging period).

Under this alternative, there were specific elements recommended in the CV-SALTS SNMP and options to those elements identified through further stakeholder meetings and Board workshops. A list of SMCL clarification elements and options identified are provided in Table D-10 in Appendix D. Where agreement on approach was not reached, options are identified below by element.

Water Quality Objectives for Surface and Groundwaters

This alternative adds reference to the contextual language of Title 22 and provides clarification on the use of ranges in Table 64449–B, consideration of background conditions and averaging periods as follows.

Unless there is an approved site specific objective, for surface or groundwaters designated MUN, the concentration of chemical constituents shall not exceed the "secondary maximum contaminant level" specified in Title 22, Table 64449–A or the "Upper" level specified in Table 64449–B, unless otherwise authorized by the Central Valley Water Board in accordance with the provisions of Title 22, section 64449 et seq. Constituent concentrations ranging to the "Upper" level in Table 64449–B are acceptable if it is demonstrated that it is not reasonable or

[68] TLB Basin Plan, p. III–2

[69] This Basin Plan language is superseded by the State Implementation Plan, which specifies how to derive effluent limitations for NPDES dischargers for priority pollutants in surface waters. Also, for surface waters the EPA only allows consideration of natural background for aquatic life constituents and not human health constituents.

[70] SRSJR Basin Plan, p. III–9.00

[71] SRSJR Basin Plan, p. IV–17.00; TLB Basin Plan, p. IV–21

feasible to achieve lower levels. Constituents ranging to the "Short Term" level in Table 64449–B may be authorized on a temporary basis consistent with the provisions of section 64449(d)(3), pending construction of treatment facilities or development of new water sources, and/or consistent with the Drought and Conservation Policy proposed as part of the Salt and Nitrate Control Program. In cases where the surface water natural background concentration of a particular chemical constituent exceeds the maximum contaminant level specified in Table 64449–A or "Upper" level specified in Table 64449–B, the surface water shall not exceed that natural background concentration due to controllable anthropogenic sources, unless the Central Valley Water Board authorizes it consistent with State Antidegradation Policy.

> Other Option Considered: *Only "Recommended" secondary MCL values may be used as the basis for WDRs.*

Surface Water: Compliance with any chemical constituent in Tables 64449–A or 64449–B shall be determined from the annual average of sample results.

Groundwater: Appropriate long-term averaging periods shall be used to evaluate compliance with any chemical constituent in Tables 64449–A or 64449–B.

> Option: *Compliance period for both surface and groundwater should be based on annual average of all collected samples.*

Application of SMCLs to Protect Municipal and Domestic Supply (MUN)

Secondary MCLs identified in Tables 64449–A and 64449-B were developed for public welfare and consumer acceptance. Lower concentrations of these chemical constituents are desirable for promoting greater consumer confidence and acceptance of water supplied by community water systems, and, where it is reasonable and feasible to do so. For Table 64449-B, WDRs should consider the "Recommended" values. These "Recommended" concentrations are not water quality objectives per se but should be considered water resource management goals similar to other public policy goals established by the Central Valley Water Board and State Water Board to encourage meeting the best possible water quality while allowing greater water conservation, increased use of recycled water, more stormwater harvesting, additional groundwater recharge and storage, better drought protection, and allowing agricultural and wastewater dischargers to continue to discharge to groundwater basins and surface water bodies.

The annual average of sample results will be used to evaluate compliance with the Secondary Maximum Contaminant Levels identified in Tables 64449-A or 64449-B.

> Option: *Allow long-term averaging to determine compliance in groundwater.*

For receiving waters that have been deemed exempt from surface water filtration requirements, compliance with chemical constituents in Table 64449–A shall be determined using an unfiltered water sample.[72]

[72] USEPA. *National Primary Drinking Water Regulations: Long Term 2 Enhanced Surface Water Treatment Rule*. 71 Federal Register: 654–786. January 5, 2006.

For receiving waters that are not exempt from surface water treatment requirements (i.e. 40 CFR Part 141, Subparts H, P, T & W), compliance with the Secondary Maximum Contaminant Levels for aluminum, copper, iron, manganese, silver, zinc, color and turbidity in Table 64449-A will be determined from samples that have been passed through a 1.5-micron filter to reduce filterable residue[73]; metal constituents will then be analyzed using the acid-soluble procedure described in EPA Approved Methods[74] as appropriate, as appropriate or other methods approved by the Central Valley Water Board. Because this approach is intended to approximate the level of treatment normally applied to raw surface water sources before such water can be distributed to the public as drinking water, the Central Valley Water Board may adjust the filter size where necessary to more accurately represent site-specific conditions based on scientific evidence submitted for their consideration and after consultation with Division of Drinking Water and public comment. This provision applies solely to evaluating compliance with Secondary Maximum Contaminant Levels for certain metals and does not affect or alter the methods used to evaluate compliance with other water quality objectives that have been established for those same metals (e.g. as Primary MCLs, California Toxics Rule or National Toxic Rule constituents, or constituents with specific objectives listed in this Basin Plan).

For groundwaters, compliance with the Secondary Maximum Contaminant Levels for aluminum, copper, iron, manganese, silver, zinc, color and turbidity in Table 64449-A will be determined from samples that have been passed through a 1.5-micron filter to reduce filterable residue[78], metal constituents will then be analyzed using the acid-soluble procedure described in EPA Approved Method[79] as appropriate, or other methods approved by the Central Valley Water Board. Because this approach is intended to account for "removal of waste constituents as the water percolates through the ground to the aquifer," as described in WQ Order No. 73-04 and Water Quality Order No. 81-05, the Central Valley Water Board may adjust the filter size where necessary to more accurately represent site-specific conditions based on scientific evidence submitted for their consideration and after consultation with Division of Drinking Water and public comment. This provision applies solely to evaluating compliance with Secondary Maximum Contaminant Levels for certain metals and does not affect or alter the methods used to evaluate compliance with other water quality objectives that have been established for those same metals (e.g. Primary MCLs or constituents with specific objectives listed in this Basin Plan).

The Central Valley Water Board may require unfiltered samples be analyzed concurrently to assess general trends in receiving water quality, implement the state's Antidegradation Policy (Res. No. 68-16), and evaluate potential downstream impacts.

Other Option Considered:

For receiving waters that are not exempt from surface water filtration requirements, compliance with chemical constituents in Table 64449–A shall be based on the techniques in (a) and (b) below.

[73] Filter size recommended in EPA Approved Methods 30 CFR Part 136 for Total Dissolved Solids and Total Suspended Solids and is used for removing suspended solids from a solid prior to analysis. Filtering the sample will remove suspended solids that may contribute to turbidity and color in samples that may negatively impact analytical results for metal concentrations while better representing the dissolved solids that may pass through a water treatment plant's filtration system.

[74] Currently EPA Approved Methods are 200.7 and 200.8 for metals, Method 180.1 for turbidity and SM 2120 F-2011 for color. EPA methods are periodically updated and future approved methods may be applicable.

(a) Compliance with the chemical constituent water quality objective may be determined using tests other than for "total", using variations of filtered samples, where such methods have been analyzed for their appropriateness, for the following constituents identified in Title 22, section 64449 (Table A): Aluminum, Color, Copper, Iron, Manganese, Silver, Turbidity and Zinc.

(b) Compliance with the chemical constituent water quality objective shall be determined from an unfiltered water sample for the following constituents identified in Title 22, section 64449 (Table A): Foaming Agents (MBAs), Methyl–tert–Butyl Ether (MTBE), Odor–Threshold and Thiobencarb.

Option: *Compliance with WDRs based on secondary MCLs in Table 64449–A for metals, color, and turbidity and in Table 64449–B for TDS, EC, chloride, sulfate is based only on a non–filtered water sample.*

Option: *Compliance with WDRs based on secondary MCLs in Table 64449–A for metals, color, and turbidity is based only on a filtered water sample.*

Option: *Utilize standard methods for filtered water samples (0.45 micron) until such time that site specific translators can be developed to better represent applicable treatment processes.*

Other Option Considered: *Compliance with secondary MCLs must be achieved at the point of discharge. (This is more restrictive than baseline/existing conditions for surface water discharges, in which the Board has the authority to grant a mixing zone and adopt WDRs with dilution credit where there is assimilative capacity.)*

Other Option Considered: *If concentrations within a water body or groundwater basin reach 80 percent of the secondary MCL at the point of a water supply intake or well, a study will be conducted to evaluate actions to reduce the concentration of the constituent.*

Other Option Considered: *Establish a monitoring program for surface waters to characterize natural background and existing conditions with respect to secondary MCLs where available data is deemed to be insufficient.*

4.2.10.2 Evaluation

SMCLs as Water Quality Objectives

Contextual Language

In the mid-1990s, the Central Valley Water Board modified its Chemical Constituents objective language in the Basin Plan, to incorporate water quality objectives for salinity, by referencing the full range of SMCL drinking water standards identified in Title 22 Table 64449–B. None of the other associated text from §64449, i.e., §64449(d) or (e), explaining how the SMCLs were to be implemented, was incorporated in addition to the tables. For example, Table 64449–B indicates three "Consumer Acceptance Contaminant Level Ranges". For TDS, the "Recommended" value is 500 mg/L, but per the associated text found in Title 22 §64449(d)(2), concentrations ranging up to an "Upper" value of 1,000 mg/L are also "acceptable," if it is neither reasonable nor

feasible to provide more suitable waters.[75] The unintentional omission of the contextual language was considered a non–substantive drafting error and, from 1994 to 2009, the Central Valley Water Board authorized WDRs using the entire range of acceptable TDS concentrations in a manner consistent with the full text of §64449.

In September 2007, the Central Valley Water Board issued a WDR and a Master Reclamation Permit to the City of Lodi.[76] Subsequently, in October 2007, the California Sportfishing Protection Alliance (CALSPA) filed a petition with the State Water Board seeking review of the aforementioned permit.

In June 2009, the Central Valley Water Board submitted written comments to the State Water Board opposing CALSPA's claim that only the "Recommended" values at the lower end of the range of SMCLs for drinking water[77] can be used as water quality objectives when developing WDRs or effluent limits. The Central Valley Water Board noted that such an approach would be more stringent than, and inconsistent with, the manner in which the California Department of Health Services (now the Division of Drinking Water [DDW]) implements these same standards for treated drinking water systems. The Central Valley Water Board also stated that there should be some exception made when the natural background concentration of one or more constituents in the receiving water exceeds the SMCL.

In July 2009, the State Water Board adopted Order WQ 2009–0005,[78] which remanded in part the Lodi permit, and directed the Central Valley Water Board to consider further if releases of wastewater from the unlined storage ponds have caused groundwater to exceed applicable Basin Plan objectives for nitrate[79] and electrical conductivity.[80] In the adopted order, the State Water Board noted that the Chemical Constituents narrative water quality objective in the SRSJR Basin Plan[81] incorporates only the SMCL numeric values and does not specifically reference the monitoring, reporting, waiver or other provisions that provide context for application of the values in those tables. The State Water Board was not opposed to using the entire range of SMCL values, but, in order to do so, the State Board determined that the Basin Plan must provide more explicit authority to the Central Valley Water Board and describe how the range of values should be applied.

The State Water Board also found that the "Short Term" value of 2,200 µS/cm EC (1,500 mg/L TDS) is not appropriate (as an applicable water quality objective) because it is "intended to apply only on a temporary basis pending construction of water treatment facilities or the development of new water sources".[82]

While the focus of the State Water Board decision was on the Sacramento River and San Joaquin River Basin Plan, the Tulare Lake Basin Plan also provides limited additional context for application of the relevant Title 22 § 64449 tables. Consequently, neither of the Basin Plans

[75] Cal. Code Regs., tit. 22, § 64449, subd. (d)(2)

[76] Central Valley Water Board Order No. R5–2007–0113; NPDES No. CA0079243.

[77] See "Recommended" column in Table 64449–B from 22 CCR.

[78] Order WQ 2009–0005 was later amended by Order WQ 2012–0001. The amendments adopted to Order WQ 2009–00005 were unrelated to the salinity provisions discussed herein. However, to ensure proper citations to the relevant order, we have provided citations to Order WQ 2009–0005, as amended by Order WQ 2012–0001.

[79] Note that nitrate has a primary maximum contaminant level (22 CCR §64431, Table 64431–A) and is not affected by this policy.

[80] State Water Board Order WQ 2012–0001, p. 23

[81] SRSJR Basin Plan, see Pg. III–3.00 for inland surface waters and Pg. III–10.00 for groundwater (Central Valley Water Board, 2016)

[82] State Water Board Order WQ 2012–0001, p. 15

provides much guidance or policy on implementation when the Central Valley Water Board is developing WDRs to implement these particular objectives. Without this information, implementation of the water quality objectives for chemical constituents in Table 64449–B as related to SMCLs creates significant challenges for the following reasons:

- When receiving water quality already exceeds a water quality objective, and there is no assimilative capacity available, and discharge limits would ordinarily be set to a concentration at or below the objective contained in the Water Quality Control Plan. Therefore, restricting the TDS objective to only the "Recommended" SMCL value in Table 64449–B could limit the amount of assimilative capacity available and obligate the Central Valley Water Board to impose WDRs that may be more stringent than necessary to protect the MUN use. For example, where TDS (or EC) in the receiving water exceeds 500 mg/L TDS (900 µS/cm EC), it is ambiguous as to whether the Central Valley Water Board would allow discharges to those receiving waters to exceed 500 mg/L (or 900 EC) even if the TDS concentration in the discharge is actually less than the TDS concentration in the receiving water and would improve receiving water quality.[83] Explicitly providing the Central Valley Water Board's authority to consider the entire acceptable range of salinity concentrations shown in Table 64449–B would provide greater regulatory flexibility to develop WDRs most appropriate for the site-specific conditions.

- A groundwater analysis[84] of TDS in Initial Analysis Zones (IAZs) and California Department of Water Resources designated groundwater basins/sub-basins in the Central Valley Region was conducted under the CV-SALTS initiative.[85] This study summarized TDS water quality for the upper zone, lower zone and production zone[86] of each groundwater basin/sub-basin in the valley floor and the basin as a whole for those basins outside the valley floor. Appendix B contains a summary of findings, in particular groundwater basins/sub-basins that exceed 500 mg/L TDS (900 µS/cm EC) or 1,000 mg/L TDS (1,600 µS/cm EC) thresholds. In general, using 500 mg/L as the threshold, 14 DWR Basins lack assimilative capacity for TDS in the production zone. If 1000 mg/L is used as the threshold, then 7 DWR Basins lack assimilative capacity for TDS in the Production Zone, respectively. Lack of assimilative capacity limits ability to authorize discharges containing salt.

- Using the "Recommended" concentration of 500 mg/L TDS (900 µS/cm EC) (Table 64449–B) at the point of compliance for the purpose of establishing WDRs makes it nearly impossible to recharge groundwater basins with recycled water unless there is significant assimilative capacity available in the aquifer because the average TDS concentration in most high quality recycled water is >500 mg/L (900 µS/cm EC). When there is no assimilative capacity available, prior precedential orders by the State Water Board (73–4 & 81–5) require effluent limits no higher than the applicable water quality objective. This complicates and inhibits statewide efforts to promote the use of recycled water for

[83] Note that in groundwater the objective applies at the groundwater table; changes to water quality may occur between the surface and first encountered groundwater, e.g., as a result of soil interactions.

[84] Luhdorff & Scalmanini Consulting Engineers and Larry Walker Associates. 2016. *Region 5: Updated Groundwater Quality Analysis and High Resolution Mapping for Central Valley Salt and Nitrate Management Plan*. Report prepared for CV-SALTS. June 2016 (Luhdorff & Scalmanini and Larry Walker Associates, 2016a)

[85] California Department of Water Resources. 2003. *California's Groundwater*. DWR Bulletin 118. California Department of Water Resources. http://www.water.ca.gov/ground water/bulletin118/index.cfm. (California Department of Water Resources, 2003)

[86] See Section 3.3.1.1 of the SNMP (CV-SALTS, 2016)

landscape irrigation and to recharge groundwater storage – water management strategies that are particularly important during times of regional or statewide drought.

- The current regulatory approach considers the "Recommended" TDS concentration of 500 mg/L (900 µS/cm EC) (Title 22 Table 64449–B) for the purpose of establishing WDRs also poses significant challenges for agricultural discharges. Assuming a relatively common leaching fraction of 15%, agricultural operators would typically anticipate concentrations below the root zone to increase by a factor of 1.6. must start with a TDS concentration no greater than 310 mg/L (560 uS/cm EC) in the irrigation supply water in order to ensure percolation below the root zone does not exceed 500 mg/L (900 µS/cm EC) when it reaches the groundwater table. Similarly, to avoid discharging TDS at concentrations greater than 1,000 mg/L (1,600 µS/cm EC) at the groundwater table, TDS in the irrigation supply water must be less than 625 mg/L (approximately 1000 uS/cm EC).[87] (Ayers & Westcot, 1985)
- Applying the "Recommended" TDS value of 500 mg/L as an annual average value immediately below the root zone at the groundwater table would also discourage the use of high efficiency drip irrigation systems with very low leaching fractions. This unintended outcome conflicts with statewide efforts to promote greater water conservation through more efficient irrigation practices.

The No Action Alternative would continue the conservative evaluation of the salinity SMCLs while the Alternative to Clarify Use of SMCLs would incorporate the contextual language surrounding use of the ranges of salinity values providing the Board the authority to provide additional flexibility with WDR limits when appropriate. Utilizing the "Recommended" levels specified in Table 64449–B as "not–to–exceed" values in WDRs and NPDES permit limits is not consistent with the full text of §64449(d), which states:

> *"(d) For the constituents shown on Table 64449–B, no fixed consumer acceptance contaminant level has been established.*
>
> *(1) Constituent concentrations lower than the Recommended contaminant level are desirable for a higher degree of consumer acceptance.*
>
> *(2) Constituent concentrations ranging to the Upper contaminant level are acceptable if it is neither reasonable nor feasible to provide more suitable waters.*
>
> *(3) Constituent concentrations ranging to the Short Term contaminant level are acceptable only for existing community water systems on a temporary basis pending construction of treatment facilities or development of acceptable new water sources."*

The numeric values were not intended as fixed maximums even for treated drinking water served directly to consumers. Given the importance of the contextual information contained in Title 22 §64449(d), the Central Valley Water Board should consider the full range of "Consumer Acceptance Contaminant Levels" described in Table 64449–B when establishing reasonable and appropriate WDRs to protect existing or potential water supplies that may be affected by the discharge.[88] This consideration would include use of the "Short Term" level on a temporary basis in those situations where construction of new facilities or connection to new water sources

[87] These are provided as examples only as the actual concentration of TDS or EC at the point of compliance at the groundwater table is influenced many factors, e.g., the type of irrigation system used and precipitation.

[88] It should be noted that reference to "full range" includes potential use of "Short Term" levels, but per §64449(d)(3), these levels are acceptable only on a temporary basis pending other actions to establish an acceptable new water source.

is pending as specified in Title 22 §64449(d)(3) or to be consistent with the proposed drought and conservation policy which recognizes additional instances of short term elevated concentrations of salt.

An option to the proposed alternative was to clarify that only the Recommended Values of Table 64449–B be identified as the water quality objectives. The conservative value was proposed in order to support preservation of high quality source waters and reduce potential for cumulative impacts of increasing salinity concentrations. The conservative approach proposed does support such efforts but is inconsistent with the original intent and purpose of the SMCLs in Title 22 and does not fully consider the requirements of the Antidegradation Policy to find maximum benefit to the people of the state before allowing any degradation to a high quality water. More detail is provided below.

- Title 22, section 64449(a) specifies that: "*The secondary MCLs shown in Tables 64449–A and 64449–B shall not be exceeded in the water supplied to the public by community water systems."* Compliance is evaluated by requiring such systems to monitor their "*groundwater sources or distribution system entry points representative of the effluent of source treatment every three years and its approved surface water sources or distribution system entry points representative of the effluent of source treatment annually….*"[89] Revising the Basin Plans to incorporate the provisions associated with the implementation of Title 22, sections 64449 and 64449.2 will allow the Central Valley Water Board, when developing appropriate WDRs for the SMCLs, to continue taking into consideration any dilution or other attenuation that may occur between the point of discharge and any intake to a downstream (surface water) or downgradient (groundwater) water supply system with allowance for an adequate buffer to ensure that the groundwater water supply system is adequately protected. The Board may determine that compliance is measured at the end of a mixing zone for surface water discharges. The Board is not necessarily obligated to authorize the full waste assimilation capacities of the receiving waters.[90] However, the recommended Basin Plan amendments will preserve the Board's discretion to regulate SMCL constituents based on what is necessary, reasonable, and feasible to protect community water systems just as it was doing prior to the Lodi decision.
- Federal and state regulations do not require adoption of the SMCLs as formal water quality objectives. Several other Regional Water Quality Control Boards have not adopted SMCLs as water quality objectives in their respective Basin Plans.[91] Instead, these other Boards rely on narrative water quality objectives to regulate mineral concentrations where necessary to protect water supply systems that may be adversely affected by a given discharge. The values shown in Title 22 Tables 64449–A and 64449–B, along with the associated text in section 64449, are used to inform the process of translating narrative objectives into appropriate WDRs.
- The SMCLs are primarily intended to protect public welfare and consumer acceptance by addressing aesthetic qualities, such as odor, taste, or minimize risk of corrosion of pipes, fixtures, valves, other plumbing materials, and household appliances; they are not intended

[89] Cal. Code Regs., tit. 22, §64449, subd.(b).

[90] See Wat. Code, §13263, subd. (b)

[91] See Basin Plans for the Regional Water Quality Control Boards in Region 3 (Central Coast Water Board); Region 6 (Lahontan Water Board); Region 7 (Colorado River Water Board); Region 8 (Santa Ana Water Board); and Region 9 (San Diego Water Board).

to address human health concerns.[92] However, elevated concentrations of some SMCL constituents may adversely affect the public's willingness to drink such water. Consumer acceptance is highly subjective and complicated by factors such as the form and combination of specific constituents (e.g., sodium–sulfate vs. calcium–sulfate) and the presence or absence of other major anions and cations.[93] The current numeric water quality objectives for SMCLs do not adequately account for the influence of these other variables.[94] Revising the Basin Plans will afford the Central Valley Water Board more flexibility to consider all relevant factors that may affect consumer acceptance of these constituents in drinking water where raw water supplies may be influenced by wastewater discharges.

- The Basin Plans establish site–specific water quality objectives for selected water bodies. Incorporation of the full range of "Consumer Acceptance Contaminant Levels," as described in Title 22 Table 64449–B, into the Basin Plans does not supersede or replace these site-specific water quality objectives.

- Water recycling, industrial discharges, and groundwater recharge provide important water supply sources, but may increase the concentration of mineral salts. Using the lowest value from the range of consumer acceptance levels to establish numeric water quality objectives for TDS or EC (see Title 22 Table 64449–B) often preclude dischargers from increasing the use of recycled water or implementing groundwater recharge projects. Moreover, such barriers can occur even where the discharges may actually improve overall quality in the receiving water. The Central Valley Water Board should have the legal flexibility to develop WDRs that balance the public benefits of water recycling, continued discharges to support industry, and groundwater recharge against any potential aesthetic impact on receiving water quality, provided that public health is protected.

- The Central Valley Water Board's ongoing obligation to issue WDRs consistent with the State Antidegradation Policy and Water Code section 13370 provides adequate protection against water quality degradation for the constituents identified in Title 22 Tables 64449–A and 64449–B. Lowering water quality for high quality waters is only permissible where the Board has issued, through the proscribed public process, waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to ensure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained. Amending the Basin Plans does not create a license to discharge the SMCL constituents at will or authorize public nuisance. These amendments will, however, clarify the Board's full range of authority to regulate these constituents in a manner consistent with the original purpose and intent of Title 22, section 64449.

Application of SMCLs When Measuring Compliance

Under the No Action Alternative, the Basin Plan does not clarify consideration of natural background, whether required treatment processes may influence appropriate sample for determining compliance with a SMCL (e.g. filtered or not filtered), or appropriate assessment time periods when determining compliance. The lack of clarification has led

[92] https://www.epa.gov/dwstandardsregulations/secondary–drinking–water–standards–guidance–nuisance–chemicals

[93] See CV-SALTS White Paper: *Salinity Effects on MUN–Related Uses of Water*; http://www.cvsalinity.org/index.php/docs/committee–document/technical–advisory–docs/water–quality–objective–reviews/3618–cvsalts–final–mun–tech–memo–120116/file.html (CDM Smith, 2016d)

[94] See Federal Register 44:42195, July 19, 1979 for establishment of SMCLs; page 42201 for discussion of sulfate.

to inconsistencies in application as well as a potential to be over conservative with compliance provisions as follows.

- *Consideration of Natural Background* – Some areas in the Central Valley have natural background TDS or EC or other constituent concentrations that exceed the "Recommended" or higher values in Table 64449–A and/or Table 64449–B. While both the SRSJB and TLB Basin Plans contain provisions for considering natural background concentrations when applying water quality objectives in general, the means for implementing these provisions in WDRs with regards to SMCLs has not always been clear. (See Appendix A for ranges of constituent concentrations in surface and groundwater.)

- *"Specific Treatment Requirements" – Language for Inland Surface Waters* – The existing Chemical Constituents water quality objective for inland surface waters includes the following statement: "*The Regional Water Board acknowledges that specific treatment requirements are imposed by state and federal drinking water regulations on the consumption of surface waters under specific circumstances.*"[95] While the Basin Plans acknowledge that specific treatment requirements are imposed by state and federal drinking water regulations, the Basin Plans provide no implementation provisions for this text. This issue is related to the following regarding appropriate sampling method to measure compliance.

- *Measuring Compliance with SMCLs* – The Basin Plans do not provide guidelines with regard to the appropriate sampling method for evaluating WDR compliance with the SMCLs in Tables 64449–A and 64449–B. Historically, drinking water suppliers and wastewater dischargers have complied with SMCLs using the total recoverable metals in a sample that undergoes no additional filtration after it has been collected. However, drinking water suppliers collect samples after some filtration of its source water occurs either through natural filtration provided by the soil in groundwater or physical filtration treatment for surface water supplies. Wastewater dischargers collected ambient source water samples that have not been filtered. Per Title 22 and federal regulations,[96] SMCLs are intended to apply to finished water delivered to a community water system after treatment, if treatment is required. The SMCLs are primarily intended to protect public welfare and consumer acceptance by addressing qualities such as odor, taste, and appearance. SMCLs also minimize risk of corrosion of pipes, fixtures, valves, other plumbing materials, and household appliances; they are not intended to address human health concerns.[97] For wastewater dischargers to continue to rely on unfiltered samples to assess compliance with SMCLs in the receiving water may overestimate the potential consumer acceptance impact on the actual quality of downstream drinking water delivered to consumers after treatment. In addition, for discharges to groundwater, filtration through natural soils or man–made systems significantly reduces the concentration of total suspended solids, including aesthetically objectionable minerals such as iron, manganese, and aluminum. Evaluating SMCL compliance using an unfiltered sample collected near the point of discharge fails to take into consideration the natural soil filtration that will occur as water percolates through the vadose zone. Analyzing a filtered sample, collected near the discharge, more accurately characterizes groundwater quality as it will likely appear when it is later extracted for public water supply.

[95] SRSJR Basin Plan, page III–3.00, and TLB Basin Plan, page III–3

[96] Federal Register 44, July 19, 1979, page 42199

[97]. https://www.epa.gov/dwstandardsregulations/secondary–drinking–water–standards–guidance–nuisance–chemicals

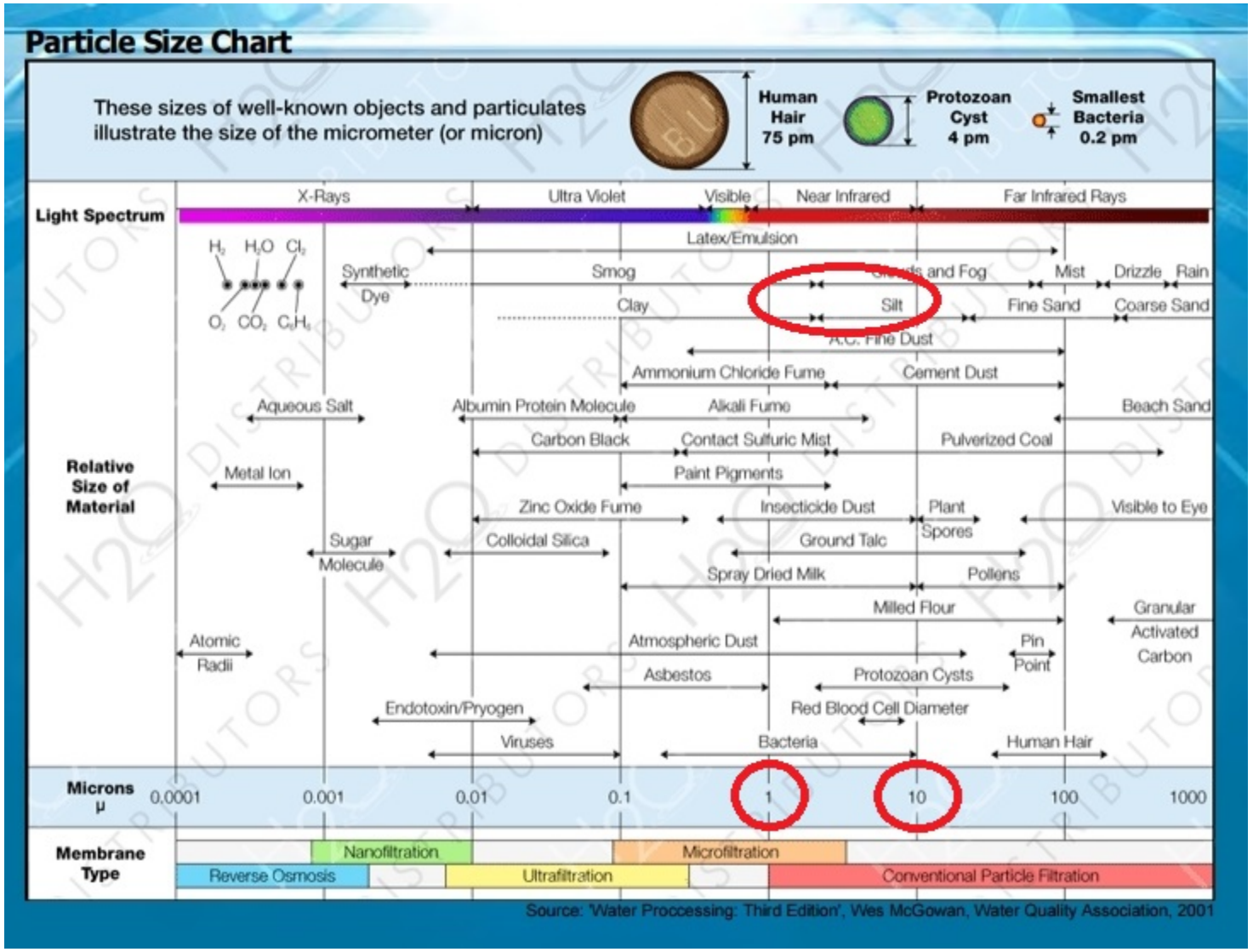
The amount of filtration that source water is subjected to prior to being delivered to the consumer will vary by treatment facility. Figure 4–9summarizes approximate corresponding filter size for various treatment processes. Stakeholders representing water purveyors identified a standard range of 1 to 10 microns for typical treatment processes (McGowan, 2001).

- *Compliance Assessment Time Period* – Per Title 22 §64449(b)(1), compliance with SMCLs in Tables 64449–A and 64449–B for drinking water systems varies depending on the source, with groundwater sources based on a single triennial sample and surface water sources based on a single annual sample. If values exceed the SMCLs for constituents in Table 6449–A, then water systems must initiate quarterly monitoring under Title 22 §64449 (c)(1), which states that compliance with Table 64449–A constituents shall be determined based on a running annual average of four quarterly samples. Title 22 §64449 does not provide a compliance assessment time period for Table 64449–B constituents. The Basins Plans currently do not provide guidelines for an appropriate compliance assessment time period for the SMCLs incorporated by reference from Title 22.

The proposed Alternative to Provide Clarification includes recommendations to address each of the noted concerns.

Consideration of Natural Background – The propose Alternative incorporates the statement from the implementation sections of the Basin Plans into both the Water Quality Objectives section specific to utilizing SMCLs as chemical constituents as well as the implementation section specific to application of SMCLs. While duplicative of the original implementation language, incorporating the language does not functionally change the Boards authority or discretion to consider natural background concentrations when developing permit limits. The proposed amendment clarifies language for the Chemical Constituents water quality objective section for cases where the natural background concentration of a particular chemical constituent exceeds the maximum contaminant level specified in Title 22 Table 64449–A or Upper level specified in Table 64449–B. In such cases, the water body shall not exceed that natural background concentration due to controllable anthropogenic sources. The proposed language also states that constituents ranging to the “Upper” level in Table 64449–B may be authorized if it is neither reasonable nor feasible to meet the “Recommended” level and constituents ranging to the “Short Term” level in Table 64449–B may be authorized on a temporary basis consistent with the provisions of Title 22, section 64449, subdivision (d)(3), which may include drought conditions when normal water supplies are not available. Within the implementation section the Recommended levels are noted as desirable and to be considered water quality management goals to encourage meeting the best possible water quality while promoting increased reuse where and when appropriate.

Figure 4 - 9. Range in Particle Size Distribution Under Alternative Filtration Techniques



- *Measuring Compliance with SMCLs* – The proposed amendment addresses the concern that use of a method measuring the total amount of an SMCL present in the source water may be an over conservative measure of the SMCL that would be delivered to the consumer.

  In California, the secondary drinking water standards are enforceable and community water systems are required to assess compliance with SMCLs by monitoring their groundwater sources or monitoring their distribution system entry points following source treatment.[98]

  Groundwater undergoes some natural filtration as that water moves through the vadose zone. USEPA's drinking water regulations require nearly all surface water sources to be filtered.[99] Therefore, in most cases, the water used to demonstrate compliance with the SMCLs has been filtered before the representative samples are collected. There is no need for the community water systems to apply any additional filtration to the sample before it is analyzed.

  Compliance with the metal constituents in Table 64449–A is evaluated using the Total Recoverable Metal method. This method requires the sample to be acidified before it is analyzed. Acidification will release any trace metal present in the suspended solids so that it can be detected during the analysis. Drinking water is either naturally low in turbidity or has been filtered to remove most of the total suspended solids. Consequently, acidifying the samples after treatment and prior to analysis, does not have much impact on the reported concentration of Total Recoverable Metals.

  Wastewater samples collected at the point-of-discharge and natural surface water generally have a much higher concentration of Total Suspended Solids (TSS) and a higher concentration of trace metals that are molecularly bound to these silt particles. Acidification will break that molecular bond and transform all metal present in the sample into a form that is easier to analyze and detect.

  For discharges to groundwater, wastewater samples collected at the point-of-discharge have not had an opportunity to undergo the process of natural filtration that occurs as such discharges percolate through the vadose zone before reaching the aquifer. Filtering such samples, prior to acidifying and analyzing the sample, is intended to mimic the natural filtration process that is expected to occur before these discharges to groundwater might be pumped from a downgradient well by a community water system.

  Requiring dischargers to use an unfiltered sample or utilizing an unfiltered sample to evaluate whether a source water is meeting water quality objectives based on SMCLs, improperly assumes that the wastewater or natural source waters will be used as a drinking water supply with no additional natural or man-made treatment between the point-of-discharge and the entry point to the municipal water distribution system. As both a practical and legal matter, very few receiving waters are exempt from surface water filtration requirements. Any discharges to receiving waters from water supply systems that have been legally exempted from filtration requirements in the Enhanced Surface Water Treatment Rule, are proposed to have compliance with all SMCLs evaluated using an unfiltered sample.

[98] Title 22 §64449(b)

[99] US EPA. *National Primary Drinking Water Regulations: Long Term 2 Enhanced Surface Water Treatment Rule*. 71 FR 654. January 5, 2006. Exceptions are sometimes granted for community water systems that rely that rely protected watersheds (ex. Hetch–Hetchy reservoir).

The proposed alternative modifies the current Central Valley Water Board staff practice to utilize dissolved measurements of SMCL constituents when determining need for limitations with Waste Discharge Requirements for SMCLs. Dissolved measurements require water samples to be filtered through a 0.45-micron filter prior to analysis[100]. A 0.45-micron filter may not represent the level of filtration utilized by water treatment facilities drawing from the source water (Figure 4–9). Therefore, the proposed alternative establishes the use of filtered samples to measure compliance in wastewater discharges or in source waters. Specifically, the alternative establishes samples to be filtered through a 1.5-micron filter[101] prior to being analyzed for their total fraction utilizing approved EPA analytical methods[102]. Filtering the sample will remove suspended solids that may contribute to turbidity and color in samples that may negatively impact analytical results for metal concentrations while better representing the dissolved solids that may pass through a water treatment plant's filtration system. The proposed amendments allow the Central Valley Water Board to adjust the filter size where necessary to more accurately represent site-specific conditions based on scientific evidence submitted for their consideration and after consultation with Division of Drinking Water and public comment. The proposed amendment also clarifies that these proposed provisions apply solely to evaluate compliance with constituents identified with Secondary Maximum Contaminant Levels. The amendment does not affect or alter the methods used to evaluate compliance with other water quality objectives that have been established for those same constituents (e.g. as Primary MCLs, California Toxics Rule or National Toxic Rule constituents, or constituents with specific objectives listed in this Basin Plan).

One option evaluated was to continue the current practice of evaluating the dissolved fraction of the SMCL constituents using a 0.45–micron filter in accordance with Federal Regulation, 40 CFR Part 136, to determine compliance. This alternative recognized using a total sample is typically over conservative and may not represent the level of filtration utilized by water treatment facilities drawing from surface waters. To address this, this alternative identified the need for the development of translators to convert dissolved objectives to effluent limitations based on total metals for a permittee, and required studies to be conducted within 10 years of the effective date of the amendment to establish appropriate guidance for developing the translators by water body segment, water body or region. The studies were to account for location of existing drinking water treatment facilities, current state and federal drinking water treatment requirements, existing treatment capabilities, and the anticipated change in source water at the drinking water treatment facility.

Several options were identified related to the use of filtered samples to measure compliance in wastewater discharges or in source waters. Options ranged from using only unfiltered samples, to specifically identifying constituents to be filtered or unfiltered, to specifically identifying filter size, to developing studies to determine appropriate filtration techniques based on the treatment processes employed. One specific option was to determine compliance from a filtered sample for all constituents in Table 64449–B and for the following selected constituents in Table 64449–A: Aluminum, Color, Copper, Iron, Manganese, Silver Turbidity and Zinc. All of these constituents can be natural elements in the environment or are a characteristic of water influenced by the presence of these elements (i.e., color or turbidity). Compliance with the remaining SMCLs in Table 64449–A, including: foaming

[100] Federal Regulations 40 CFR Part 136, Appendix C, Definitions

[101] Filter size recommended in EPA Approved Methods 30 CFR Part 136 for Total Dissolved Solids and Total Suspended Solids and is used for removing suspended solids from a solid prior to analysis

[102] Currently EPA Approved Methods are 200.7 and 200.8 for metals, Method 180.1 for turbidity and SM 2120 F-2011 for color. EPA methods are periodically updated and future approved methods may be applicable.

agents (MBAs; surfactants), Methyl–tert–butyl ether (MTBE) (gasoline additive), Odor Threshold and Thiobencarb (pesticide) would be determined from a non–filtered sample due to the potential for volatilization or other chemical changes that the filtration process may instigate. None of these constituents, except odor, is an element or quality found in the natural environment.

The primary issues noted with any option was that utilizing a total sample would in most cases be over conservative but that use of standard methods to analyze a dissolved sample would not necessarily represent filtration that occurs in a water treatment plant.

- *Compliance Assessment Time Period* – Language has been proposed for the implementation section of the Basin Plans to state that an evaluation of compliance with SMCLs in Tables 64449–A and 64449–B shall be at a minimum based on an annual average of collected samples from all analytical results collected from where compliance is determined. This approach is similar to Title 22 §64449(c)(1) as it applies to Table 64449–A. Title 22 §64449 does not provide a compliance determination approach for Table 64449–B constituents; however, the same compliance assessment approach is recommended for the constituents in both Table 64449–A and 64449–B constituents.

  Longer compliance time periods are identified in the alternative as being appropriate for groundwater. While consumer protection in water supplied is required to be based on annual averages, for the groundwater basin as a whole, it is appropriate to consider the fact that many groundwater wells are screened so that they extract groundwater from multiple aquifer levels that are recharged from different areas over different time intervals. Consistent with Water Code section 13263's requirement to consider the water quality objectives "reasonably required" to protect beneficial uses, a Regional Water Board has some discretion to determine where and how compliance with a water quality objective must be demonstrated. For groundwater aquifers with longer "memory" and varying water quality and recharge conditions, overall protection of beneficial use would need to account for local conditions and allow for longer term averaging periods.

- *Establishing triggers and monitoring requirements.* Options were proposed to incorporate triggers within the implementation section so that if a water supply intake or well reached 80% of the secondary MCL at the point of a water supply intake or well, a study would be conducted to evaluate actions to reduce the concentration of the constituent. This option was proposed in tandem with establishing a monitoring program for surface waters to characterize natural background and existing conditions with respect to SMCLs where available data was deemed to be insufficient.

  The Central Valley Water Board relies upon a variety of measures to obtain surveillance and monitoring information including: data collected by other agencies; coordination with State Water Board efforts; special studies; compliance monitoring and complaint investigations. The Basin Plans state the Board's "… *long-term goal to have a system in place that facilitates consolidation of information gathered from all agencies in a format that can be readily utilized to provide the foundation for regular assessments of ambient surface water quality conditions…"* Part of the information relied upon includes the watershed sanitary surveys required under Title 22, section 64665 et seq. These surveys require an evaluation of changing conditions within watershed providing source water to consumers as related to impacts to drinking water supplies. As part of the case study Basin Plan Amendment to develop a standardized process to evaluate appropriate designation and level of protection of MUN in agriculturally dominated water bodies, amendments to the Surveillance and

Monitoring sections of the Basin Plans were proposed (and adopted through Resolution R5–2017–0088) as follows.

> *". . . As resources permit, Regional Water Board staff will work with other agencies and regional monitoring programs to monitor chemical constituents, pesticides, and radionuclides contained in the Title 22 of the California Code of Regulations approximately every 3 to 5 years in major water bodies identified with existing or potential MUN use including but not limited to the Sacramento River, Feather River, San Joaquin River and Delta. The data gathered will support Watershed Sanitary Surveys (Cal. Code Regs, tit. 22, § 64665 et seq.) as well as the California Integrated Report (Clean Water Act Section 303(d)/305(b)). . . "*

The coordinated and collaborative monitoring proposed under the case study is consistent with the overall long-term goal of the Board to utilize information from all agencies for regular assessments of ambient surface water quality conditions. Information gathered in and recommendations from watershed sanitary surveys are an appropriate component of broad based monitoring efforts. Understanding overall ambient and changing conditions in watersheds would be a critical factor before developing specific numeric triggers to evaluate actions to reduce concentrations on a site by site basis.

- *Option to focus clarifying amendments to SMCLs identified in Table 64449–B and to exclude discussion of SMCLs in Table 64449–A.* Initial public scoping sessions for the development of a Central Valley–wide Salt and Nitrate Management Plan held in 2013, initially identified inconsistencies with application of SMCLs in Table 64449–B (TDS, EC, chloride and sulfate). During the public scoping meetings and during publicly accessible stakeholder meetings under the CV-SALTS initiative, inconsistencies in application of all SMCLs were identified including consideration of natural background conditions, averaging periods and sample type (total vs. dissolved). Limiting proposed clarifications to constituents identified in Table 64449–B would be inefficient and inconsistent with issues identified at the scoping meetings and further public discussions. Consideration of natural background conditions and averaging periods translates clearly to constituents in both tables. Greater variability occurs when clarifying appropriate sampling type as noted in the section above discussing "Measuring Compliance with SMCLs" and use of dissolved or total samples or some other filtration technique for a "non–total" sample. Additional information was collected on background conditions of Table 64449–A constituents and impacts of different filtering techniques on resulting particle size. Proposing clarifications for all SMCLs during this amendment process is efficient and appropriate.

4.2.10.3 Recommendation

Staff recommends the Alternative to Provide Clarifying Language for Use of SMCLs with the following understandings.

- The Basin Plans should be amended to incorporate implementation provisions recognizing the contextual information in Title 22, Division 4, Chapter 15, Article 16, especially §64449 and §64449.2 and clarify consideration of natural background conditions, compliance assessment time period, and sample type – as appropriate to clarify use of SMCLs.

- The proposed changes apply only for the purpose of interpreting and implementing the SMCLs. Some SMCL constituents (e.g., priority pollutants, primary MCLs) have separate water quality objectives intended to protect aquatic life and public health. The proposed

change would not change these other objectives or the manner in which compliance with these objectives is currently assessed.

- The proposed clarifications do not alter any site-specific objectives that have been adopted including but not limited to those that apply in the Sacramento–San Joaquin Delta or the Lower San Joaquin River.

- It is appropriate for dischargers to work collaboratively with Central Valley Water Board staff and water purveyors to better understand natural background conditions, trends and filtration procedures that better represent area treatments systems supplying drinking water. Until translators are identified by water body segment, water body or basin, it is appropriate to utilized dissolved samples when measuring compliance with metals identified in Table 64449–A as well as turbidity and color. Volatile constituents should continue to be analyzed using total methods.

- It may be appropriate to develop guidelines in conjunction with the Division of Drinking Water and affected stakeholders in the future to support the Basin Plans to further describe how the following existing Basin Plan language would be considered when developing WDRs for discharges to inland surface waters: "*Regional Water Board acknowledges that specific treatment requirements are imposed by state and federal drinking water regulations on the consumption of surface waters under specific circumstances.*"

- To address concerns expressed related to source water protection, several considerations were identified for use during the development of WDRs. These considerations are listed in Appendix G.

4.3 SUMMARY

Based on information gathered during the CV-SALTS initiate, follow–up stakeholder efforts, CEQA scoping meetings, and Board workshops the following project alternatives for a Central Valley–wide Salt and Nitrate Control Program were developed:

1. No Action
2. Incorporate a Central Valley–wide Salt and Nitrate Control Program with supporting policies and guidance based on alternatives to specific components of the CV-SALTS SNMP (2016) recommendations as developed through further stakeholder discussion and Board workshops.

4.3.1 No Action Alternative

A No Action Alternative is required by CEQA and would result in no amendments to the Basin Plans; rather the Basin Plans would continue to maintain existing regulatory framework to control the discharges of salt and nitrate throughout the Central Valley. Discharges of salinity and nitrate would continue to be regulated on a permit-by-permit basis with a focus on source control to protect beneficial uses within the receiving water body. No groundwater salt and nitrate management plans would be incorporated.

4.3.2 Incorporate a Central Valley–wide Salt and Nitrate Control Program with Supporting Policies and Guidance

This alternative prioritizes management of salt and nitrate to first ensure safe drinking water supplies; then continue and increase ongoing activities to balance salt and nitrate loading; followed by requiring long-term, managed restoration. Several components are included: a phased salt management strategy; a prioritized nitrate permitting strategy that includes authorities for regulation under management zones and means of alternative compliance; a sampling and monitoring plan; a conditional prohibition for salt and nitrate dischargers; a monitoring and surveillance program; recommendations to other agencies; and several supporting policy recommendations (revisions to the Exceptions and Variance Policies; a new Offsets Policy; a new Drought and Conservation Policy; and consideration of use of secondary maximum contaminate levels to protect the MUN beneficial use).

Staff recommends incorporation of a Central Valley–wide Salt and Nitrate Control Program with supporting policies and guidance. Guidance includes use of models and studies developed under the CV-SALTS SNMP (2016) as well as the SNMP itself. Specific guidance is also proposed for the development of Alternative Compliance Projects (Appendix H), Maximum Benefit Determinations (Appendix I), and SMCL considerations when developing permits (Appendix G). Further review under the P&O Study is recommended for the following issues:

- Determination of appropriate compliance point for discharges to groundwater (e.g. effluent; upper zone; defined shallow zone; etc.);
- Determine whether consumption use guidelines are an appropriate compliance measure for future phases of salt management. ;
- Use of Extended Dry Periods in the Sacramento River and Tulare Lake Basins;
- Inclusion of boron as one of the constituents under the policy;
- Use of Offset Credits for long-term management of salt in groundwater basins; and
- Use of offsets for surface water discharge compliance.

The proposed amendments provide the regulatory authority to sustainable manage salt and nitrate within the Central Valley while ensuring safe drinking water supplies and moving toward long-term, managed restoration of groundwater basins, where reasonable, feasible and practicable. The proposed amendments do not remove any existing authorities of the Central Valley Water Board, which may use its discretion whether a discharge needs more prescriptive regulation.

Summaries of the Salt Control Program and the Nitrate Control Program with examples of anticipated activities for different categories of permittees are provided in Appendices I and J, respectively.

5 ANTIDEGRADATION

5.1 ANTIDEGRADATION COMPLIANCE

This section contains an evaluation of the proposed Central Valley Salt and Nitrate Control Program's consistency with the State and federal antidegradation policies. The proposed program consists of a suite of policies and guidance that are intended to achieve the following goals:

- Ensure a Safe Drinking Water Supply;
- Achieve Balanced Salt and Nitrate Loadings, where reasonable and feasible;
- Implement a Managed Aquifer Restoration Program, where reasonable and feasible.

The Basin Plan Amendments that have been developed to implement the program would establish a regulatory framework to achieve long-term improvements in ambient water quality conditions in surface waters and groundwater in the Central Valley. However, achieving the goals will not be immediate; water quality degradation will occur while long-term management practices are being developed and implemented. This antidegradation analysis is a programmatic assessment of this degradation. Subsequent project-level antidegradation analyses will be performed by local agencies or entities that will implement projects under the proposed program.

5.1.1 State Antidegradation Policy

The State Water Board has adopted the Statement of Policy with Respect to Maintaining High Quality Waters, State Water Board Resolution No. 68-16 (State Antidegradation Policy). High-quality waters are those surface waters or areas of groundwater that have a baseline water quality better than required by water quality control plans and policies. The State Antidegradation Policy requires the Central Valley Water Board to issue WDRs that maintain the high quality of those waters unless it finds that any degradation of water quality:

(1) will be consistent with maximum benefit to the people of the state;
(2) will not unreasonably affect present or probable future beneficial uses of such water; and
(3) will not result in water quality less than prescribed in water quality control plans or policies.

In addition, any waste discharge requirements issued by the Central Valley Water Board must require that discharges to high quality waters result in the best practicable treatment or control necessary to ensure that no pollution or nuisance will occur and the highest water quality consistent with the maximum benefit to the people of the State will be maintained.

5.1.2 Federal Antidegradation Policy

The USEPA has established a federal antidegradation policy applicable to water quality programs in 40 CFR section 131.12 (Federal Antidegradation Policy). The Federal Antidegradation Policy states:

(a) The State shall develop and adopt a statewide antidegradation policy and identify the methods for implementing such policy pursuant to this subpart. The antidegradation policy and implementation methods shall, at a minimum, be consistent with the following:

(1) Existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected.

(2) Where the quality of the waters exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected unless the State finds, after full satisfaction of the intergovernmental coordination and public participation provisions of the State's continuing planning process, that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. In allowing such degradation or lower water quality, the State shall assure water quality adequate to protect existing uses fully. Further, the State shall assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control.

(3) Where high quality waters constitute an Outstanding National Resource Waters, such as waters with exceptional ecological, recreational or environmental assets, that water quality shall be maintained and protected.

(4) In those cases where potential water quality impairment associated with a thermal discharge is involved, the antidegradation policy and implementing method shall be consistent with section 316 of the Act.

5.1.3 Degradation that May Reasonably Be Expected to Occur After Adoption of the Salt and Nitrate Control Program

Broadly speaking, the Central Valley-wide Salt and Nitrate Control Program will establish a Salt Control Program, a Nitrate Control Program, Guidance for Implementing Secondary Maximum Contaminant Levels, and a several policies that will be incorporated into the Basin Plans to effectuate and implement the Salt and Nitrate Control Program. This section of the staff report evaluates the potential degradation that may occur due to the implementation of the Salt and Nitrate Control Program in the following three areas where water quality degradation is reasonably expected to occur:

- Salinity Degradation that may occur Under the Salt Control Program and its associated policies (Variance Policy, Offsets Policy, and Drought Policy)
- Nitrate Degradation that may occur under the Nitrate Control Program and its associated policies (Exceptions Policy and Offsets Policy)
- Degradation that may occur due to the new implementation provisions for Secondary MCLs

In this evaluation, “short term” is defined as the period prior to implementation of long-term salt or nitrate management actions (on the order of two or more decades). “Long term” is defined as the period after implementation of salt and nitrate actions to address the program goals (on the order of 20 to 50 years).
Because the Basin Plan is not self-implementing, the Board’s adoption of the Salt and Nitrate Control Program would not itself authorize any activities that would cause water quality degradation. The analysis contained herein therefore does not contain a granular analysis of every permittee whose permit may be modified pursuant to the Salt and Nitrate Control Program. Instead, this analysis describes how the implementation of the Salt Control Program would change how the Board permits activities that may cause degradation, and how such

degradation will be required to be consistent with applicable state and federal antidegradation policies.

Lastly, given that it is unusual to find substantial amounts of high quality historical data from the 1970's and 1980's, let alone 1968[103], for many areas in the Central Valley, the findings presented herein are presented as qualitative assessments. In this qualitative evaluation, current water quality conditions in the Central Valley provide a frame of reference.

5.2 SALT CONTROL PROGRAM

The proposed Program for Control and Permitting of Salt Discharges in the Sacramento-San Joaquin River Basins and in the Tulare Lake Basin (Salt Control Program) provides the Central Valley Water Board with the authority to manage salinity in the Central Valley by establishing a structure through which permittees that are contributing to salinity degradation can work collaboratively to control the rate of salinity degradation, achieve long-term sustainability (salt balance), and protect beneficial uses. The Salt Control Program includes three phases:

Phase I – Prioritization and Optimization Study (P&O Study)
Phase II – Project Development and Acquisition of Funds
Phase III – Project Implementation

Phase I of the Salt Control Program will be primarily focused on advancing the P&O Study, a collaborative planning effort designed to include most permittees in the Central Valley, as well as other parties who will benefit from long-term salinity management. The information developed for the P&O Study will be the basis for determining and demonstrating how salinity in the Central Valley will be managed over the short and long-term to meet the applicable management goals.

The key elements of the P&O Study include: identification of the suite of regional and sub-regional projects to be implemented to manage salinity, conceptual design of regional and sub-regional projects, development and implementation of a funding plan and financing strategy for the identified projects, establishment of a governance plan, strategic planning to address regulatory and policy issues, and stakeholder coordination. The P&O Study is intended to set the stage for design and construction of the identified salinity management projects, which may include out-of-valley solutions such as a regulated brine line.

Under Phase I of the Salt Control Program, permittees that discharge salinity will be subject to a "Conservative Salinity Permitting Approach" unless the permittee elects to be regulated under an "Alternative Salinity Permitting Approach."

The main element of the Conservative Salinity Permitting Approach is application of conservative numeric values to implement water quality objectives in Board-issued permits. Under the Conservative Salinity Permitting Approach, when the Board develops permit requirements to protect the AGR beneficial use, it will generally use the numeric value of 700 µS/cm electrical conductivity (EC) (as a monthly average). When the Board applies a Secondary Maximum Contaminant Level (SMCL) for protection of a MUN beneficial use, the Central Valley

[103] If data are available, the State Antidegradation Policy generally defines "baseline" based on the water quality that existed in 1968 (the year that the policy was adopted), minus any degradation that has been legally authorized since then. It should be noted that the consideration of water quality conditions existing in 1968 should be used in project-specific evaluations where ambient data is available to enable such an assessment.

Water Board will generally use the recommended SMCL of 900 µS/cm EC (as an annual average). NPDES Permittees regulated under the Conservative Salinity Permitting Approach are ineligible for variances.

In contrast, the Salt Control Program's Alternative Salinity Permitting Approach gives permittees the opportunity to participate collectively in the P&O Study with other permittees, the Central Valley Water Board, and other stakeholders during Phase I of the Salt Control Program. Instead of the stringent numeric values applied to the discharge, permittees participating in the Alternative Salinity Permitting Approach will be required to participate in P&O Study, implement reasonable salinity management practices, source control efforts, and pollution prevention plans, generally maintain current discharge levels of salinity, and monitor for salinity as required in the associated Surveillance and Monitoring Program (SAMP).

NPDES Permittees participating in the Alternative Salinity Permitting Approach may seek variances consistent with the modified Variance Policy during Phase I of the Salt Control Program (and possibly into later phases). The Salt and Nitrate Control Program also includes an Offsets Policy, which would allow the Board to authorize a type of Alternative Compliance Project where a permittee that is unable to comply with certain permit limitations would instead undertake a beneficial off-site project that would result in a net beneficial effect on receiving water quality. The Salt and Nitrate Control Program would also establish a Drought and Conservation Policy, which would give the Board additional flexibility in establishing permit limitations when permittees are unable to achieve compliance with permit limits due to the effects of a drought or due to increased water conservation.

5.2.1 Degradation that May Occur Under the Salt Control Program and Related Policies

5.2.1.1 Salt Control Program

For NPDES permittees that discharge to surface waters, the Central Valley Water Board generally prescribes water quality based effluent limitations for salinity to protect beneficial uses in the receiving water. For non-NPDES surface water discharges and discharges to groundwater, the Central Valley Water Board currently requires that permittees comply with water quality objectives developed for the protection of beneficial uses in surface waters and/or in the "first-encountered groundwater" underlying their discharge. The Board enforces these requirements through permit limitations and requires monitoring to verify compliance with the Board-imposed requirements. For the MUN use, salinity objectives are in the form of secondary maximum contaminant levels (SMCLs), which are derived from Title 22 of the California Code of Regulations, and consist of a range of salinity concentrations designed to protect the aesthetics, taste, and consumer acceptance of drinking water. For the AGR use, narrative salinity objectives are implemented to protect the growth and yield of salt-sensitive crops.

The proposed Salt Control Program would change how the Board will determine compliance with salinity water quality objectives during Phase I– a time period which is expected to span 10-15 years. During Phase I, the Salt Control Program mandates compliance with one of two permitting pathways. Under the first pathway, the Conservative Salinity Permitting Approach, dischargers will either be held to stringent standards to protect MUN and AGR (700 or 900 EC, respectively), or would be subject to permit terms that would require the discharge to achieve even better quality, if application of BPTC would result in even less degradation. Thus, there will be little to any degradation expected under the Conservative Salinity Permitting Approach. In other words, under the Conservative Salinity Permitting Approach, degradation is expected to

be minimal, because the Board will be imposing stringent limitations as permit terms, and will still be conducting an antidegradation analysis when imposing these permit limitations.

However, permits issued under the second pathway, the Alternative Salinity Permitting Approach, are expected to result in water quality degradation in some areas. Under the Alternative Salinity Permitting Approach, the focus of permittees' efforts will be on maintaining current performance and participating in the P&O study. Studies conducted in conjunction with the development of the SNMP documented the widespread degradation that current salinity management are causing throughout the Central Valley. Because permittees regulated under the Alternative Salinity Permitting Approach would be held to permit requirements largely based on current performance levels, degradation would be expected to continue at current levels for these permittees during Phase I of the proposed Salt Control Program. However, the Salt Control Program is nonetheless consistent with the State Antidegradation Policy because the degradation that could be authorized by the Board during Phase I is limited to the extent practicable, and the long-term strategy is expected to result in significant water quality improvements over subsequent phases of the program. The Salt Control Program is consistent with the federal Antidegradation Policy because it preserves existing instream water uses and the level of water quality necessary to protect these existing uses, even considering degradation expected during Phase I.

5.2.1.2 Variance Policy – Salinity Degradation

The Central Valley Water Board adopted amendments to the Basin Plans to incorporate a salinity variance program in 2014 (Salinity Variance Program). The Salinity Variance Program is a multiple-surface-water-permittee variance program that is applicable to publicly owned treatment works (POTWs) that have a situation comparable to the three case study cities included in the Central Valley Water Board's supporting documentation for the 2014 basin plan amendments.[104] The existing Salinity Variance Program applies to the following parameters: EC, TDS, chloride, sulfate and sodium. The Salinity Variance Program allows POTWs to obtain a variance from water quality objectives that would otherwise require compliance with water quality based effluent limitations that they are unable to meet.

The proposed revisions to the Salinity Variance Program would enhance the Central Valley Water Board's authority to issue salinity variances; while the existing Salinity Variance Program prohibits the Central Valley Water Board from approving any salinity variance after June 30, 2019, the proposed revisions would extend this date to 15 years after the effective date of the Salt Control Program. In addition, the proposed Salinity Variance Revisions would extend application of the existing Salinity Variance Program to include salinity water quality objectives related to the MUN beneficial use in addition to the AGR beneficial use. However, degradation that could occur as an indirect result of these revisions is expected to be limited because the revisions to the Salinity Variance Program will establish requirements that must be met for the Central Valley Water Board to approve variances. For example, the proposed Salinity Variance Revisions will require that POTWs prepare a Salinity Reduction Study Work Plan, implement salinity reduction/elimination measures, participate in a P&O Study as Phase I of a Salt Control Program, and otherwise contribute to the development and implementation of the phased Salt Control Program for the Central Valley.

[104] [Permittees that are not a significant source of salinity, and can't do much to reduce salinity except going to R/O, which would be a costly waste of resources.]

5.2.1.3 Offsets Policy

The Offsets Policy would allow the Central Valley Water Board to approve projects whose aggregate net effect on receiving water quality is functionally equivalent to or better than that which would have occurred by requiring a discharger to comply with its permit at the point of discharge. Permittees with an approved offset would perform the Board-approved offset project which, in combination with the existing discharge, would result in a project deemed to be equal to, or better than, the results obtained through application of the current approach. For salinity, offsets are critical to the establishment of out-of-valley salinity solutions and salt sinks.

Offset projects, by their very nature, will result in localized degradation. However, the conditions placed upon any Board-approved offset, in combination with the implementation placed on the project itself, are expected to result in degradation that will be consistent with the state and federal antidegradation policies as described below. These include conditions requiring that offsets projects be enforceable through permit terms, not result in unmitigated localized impairments, and include a monitoring and reporting program sufficient to verify that projected pollution reduction credits are actually realized.

5.2.1.4 Drought and Conservation Policy

The proposed Drought and Water Conservation Policy (Drought & Conservation Policy) would augment the Board's authority to establish permit limits designed to account for the effects of drought where discharges are impacted by either inferior water supplies (due to a switch from surface water to groundwater supplies) or by water conservation measures. Specifically, under the proposed Drought & Conservation Policy, the Board could establish permit limits based on a long-term flow-weighted average to determination of compliance with salinity water quality objectives in groundwater. This approach would account for the effects of natural precipitation and stormwater recharge, and could also account for times when discharge quality is substantially better than required to meet permit limits. The Drought & Conservation Policy could also authorize the use of offset projects (consistent with the Offsets Policy) to demonstrate compliance with permit limits for salinity through the use a "banking" system where the quality of discharges during drought and non-drought years would be taken into account over a long planning horizon (i.e. at least 20 years).

Little degradation is expected to occur due to the establishment of the Drought & Conservation Policy, because the practices regulated by the new policy provisions have been ongoing in the Central Valley for decades. Droughts are nothing new, and communities and growers have regularly been forced to utilize additional groundwater supplies in times of surface water scarcity. Further, water conservation practices, though they may result in increases in salinity concentrations, do not generally result in significant new loading. One of the policy priorities of both the Central Valley Water Board and the State Water Board is to increase drought resiliency statewide. The resiliency authorized through the Drought & Conservation Policy is consistent with this policy priority and with the state and federal antidegradation polices as discussed below.

5.2.2 Consistency with the State Antidegradation Policy

The Salt Control Program anticipates that the Central Valley Water Board will revise WDRs, conditional waivers, and NPDES permits to incorporate salinity requirements, which may allow for degradation in the short-term. When approving such WDRs, conditional waivers and NPDES permits, the Board must find that degradation authorized by the permit is consistent with the maximum benefit to the people of the state, that the degradation will not unreasonably affect

present or probable beneficial uses, that the degradation will not result in water quality less than prescribed in applicable water quality control plans or policies, and that the permittee(s) will employ treatment or control methods that will result in "best practicable treatment or control" of the wastes in their discharges. In addition, in order for the Board to authorize degradation when issuing permits to permittees regulated under the Conservative Salinity Permitting Approach, the Board must specifically find that allowing a permittee to degrade high-quality water better serves the people of the state rather than their participation in the P&O Study.

The Salt Control Program will not eliminate the need for the Central Valley Water Board to conduct hearings and make findings regarding whether or not WDRs, conditional waivers, and NPDES permits adopted under the Salt Control Program will ensure that all of the conditions of the State Antidegradation Policy are satisfied before the discharge is authorized. The following subsections describe the considerations that will go into the Board's evaluation of any degradation authorized under the Salt Control Program.

5.2.2.1 Degradation authorized under the Salt Control Program will be Consistent with Maximum Benefit to the People of the State

Elevated salt concentrations in portions of the Central Valley impair, or threaten to impair, the region's water and soil quality. If left unaddressed, ongoing salt accumulation will have dire consequences on agricultural productivity. Expansive areas of groundwater basins already contain concentrations in excess of levels known to impact beneficial uses. Studies documenting potential restoration alternatives indicate that current technologies are expensive and will take decades to implement. These studies demonstrate that the volume and mass of unmanaged salt will remain high, even under scenarios where existing salt management tools are widely adopted. Therefore, a comprehensive solution to the salinity issues in the Central Valley will need to rely on both local and sub-regional solutions as well as broad region-wide projects that will export salt out of the Central Valley.

The Salt Control Program is designed to allow short-term degradation while comprehensive basin-wide salinity management strategies are developed and implemented. Authorizing such degradation would grant permittees the latitude to develop long-term implementation plans that are both cost-effective and that prioritize compliance alternatives that will have a greater net regional and/or sub-regional effect on salinity reduction. Though these measures will ultimately require that permittees and other parties make substantial and meaningful investments in salinity reduction strategies and control measures, granting extended compliance timelines helps ensure that regulatory measures do not unreasonably affect the economic vitality of the Central Valley's communities by allowing productive agricultural activities to continue, cities and municipalities to grow, water deliveries to continue, and industries to thrive while these stakeholders collectively pursue a basin-wide salt management strategy. For these reasons, the Salt Control Program, and the degradation that may be authorized thereunder, is consistent with the maximum benefit of the people of the State.

5.2.2.2 Degradation under the Salt Control Program will not unreasonably affect present or probable future beneficial uses of such water

For the MUN beneficial use, salinity degradation can impact consumer acceptance of the water. For the AGR beneficial use, salinity can impact the yield for salt sensitive crops. Aquatic life beneficial uses also depend on certain salinity concentrations, though those concentrations are

generally higher than those necessary to impact the MUN and AGR beneficial uses[105]. The Salt Control Program seeks to ensure the long-term protection of these beneficial uses in the Central Valley by establishing a long-term strategy to avoid salt accumulation in the Central Valley's soils and groundwater that could ultimately result in vast swaths of the valley becoming unusable for traditional agriculture and that could place severe restrictions on the growth of communities and industry.

The Central Valley Water Board recognizes that, by authorizing discharges that do not meet the most protective salinity standards while long-term strategies are developed, degradation will occur. However, all elements of the Salt Control Program are designed to restrict degradation such that beneficial uses will be preserved in the long-term. For permittees regulated under the Conservative Salinity Permitting Approach, which are only those dischargers that can meet the 700/900 EC thresholds, additional degradation would be limited because the Board will still require permittees to achieve even better quality, if practicable means of reducing degradation are available. For those permittees participating in the Alternative Salinity Permitting Approach, the following conditions limit the effect that degradation may have on present and probable future beneficial uses:

- Permittees must implement salinity management practices and/or source control efforts;
- Permittees must implement pollution prevention plans, watershed plans, and/or salt reduction plans;
- Permittees must monitor of salinity in surface waters and groundwater as part of existing monitoring programs, or through regional monitoring programs, which will be coordinated under the associated Surveillance and Monitoring Program (SAMP); and
- Permittees will be required to maintain current discharge levels of salinity to the extent feasible, reasonable and practicable.

Variances, which would apply when a NPDES Permittee cannot meet thresholds reasonably protective of beneficial uses, have even more stringent requirements that would limit the amount and duration of any degradation that could occur as a result of the Board's approval of the variance. Likewise, offsets for salinity, though they would authorize spatially-limited degradation, would still result in a positive net effect on water quality and are subject to a host of conditions to ensure that offset credits are actually being generated and that credits are adequate to offset discharge loads. Lastly, the Drought and Conservation Policy will allow degradation during droughts, when the overarching concern is not the salinity of the water source, but the availability of water, which is largely outside the control of the discharger. Even so, the main elements of the Drought and Conservation Policy are not expected to result in significant detriments to beneficial uses – the drought elements primarily allow the Board to consider long-term averaging periods without authorizing significant load increases, and water conservation, though it may result in concentration increases, is not expected to result in increased salt loading.

In limited cases, the Central Valley Water Board may need to evaluate the need to alter beneficial uses. However, such a consideration is a last resort, and only after it has been demonstrated that attainment of objectives not reasonably achievable. Otherwise, all salinity management strategies need to include long-term implementation plans for protecting beneficial uses.

[105] In limited cases, spawning sturgeon in specific water bodies during certain seasons may require salinity concentrations lower than those that would be protective of the MUN and AGR beneficial uses. Permit limitations will require the protection of such species on a case-by-case basis.

5.2.2.3 Degradation under the Salt Control Program will not result in water quality less than prescribed in other applicable water quality control plans or policies

The State Antidegradation Policy requires that degradation authorized by the Central Valley Water Board not result in water quality less than prescribed in applicable water quality control plans or policies. As a program that will be implemented through amendments to the Central Valley Water Board's water quality control plans, degradation authorized under the Salt Control Program will be consistent with the water quality control plan. Consistency with other policies is analyzed in section 6.0 of this Staff Report.

5.2.2.4 Degradation under the Salt Control Program will be limited by the requirement that discharges to high-quality waters implement BPTC

Both of the Salt Control Program's permitting pathways would require the implementation of BPTC by dischargers regulated under Board-issued permits. As described above, permittees regulated under the Conservative Salinity Permitting Approach would either be subject to stringent 700/900 EC thresholds or permit limits that require even better quality, if practicable means of reducing degradation beyond those thresholds may be feasibly implemented by the permittee.

The Alternative Salinity Permitting Approach differs from the Board's current permitting approach in that it would allow the Board to consider the "practicability" of the actions of permittees in the context of their participation in the long-term salinity management efforts through support of the P&O Study, in setting permit requirements. Under the current permitting approach, the practicability of individual treatment or control methodologies is examined on a case-by-case basis, with focus on either the shallow zone of the groundwater aquifer or the surface water in the immediate vicinity of a discharge. In other words, if the Board was considering waste discharge requirements for multiple individual facilities on a permit-by-permit basis, it would need to evaluate whether each individual facility was implementing pollution or control methods that were "best practicable treatment or control" based on the financial and technical capacities of each of the facilities on its own. Under the traditional permitting approach, if the facilities found that it might be practicable for them to participate in a larger regional or sub-regional effort to control salinity that would reduce pollutant loadings to a greater degree in the long term than each could individually afford on their own, there would still be some ambiguity as to whether the Board could consider this alternative the "best practicable treatment or control" alternative.

However, under the Alternative Salinity Permitting Approach, the Board would be afforded the ability to take a broader view of practicability on the scale of the Central Valley. This broader view is critical to basin-wide management, where studies commissioned by CV-SALTS have conclusively demonstrated that individual actions cannot reasonably be expected to achieve long-term salinity balance in the Central Valley basin, which is necessary to preserve beneficial uses well into the future. This does not mean that BPTC is jettisoned under the Alternative Salinity Permitting Approach. Rather, the Salt Control Program allows the Board to take the position that a significant portion of the resources available to a discharger (these resources, of course, define what is considered "practicable") are better expended on regional solutions rather than on site-specific treatment or control methodologies. Furthermore, the Board would still be expected to evaluate whether the regional treatment or control methodologies proposed by the P&O Study should be considered "BPTC" in the latter phases of the Salt Control Program.

5.2.3 Consistency with the Federal Antidegradation Policy

Consistent with the provisions of the Federal Antidegradation Policy, which is applicable to the regulation of discharges to navigable surface waters of the United States, the following additional requirements are applicable to the proposed Salt Control Program:

(1) Existing in-stream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected.

(2) Where the quality of the waters exceeds levels necessary to support the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected unless the State finds, after full satisfaction of the intergovernmental coordination and public participation provisions of the State's continuing planning process, that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. In allowing such degradation or lower water quality, the State shall assure water quality adequate to protect existing uses fully. Further, the State shall assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control.

5.2.3.1 Ensuring that existing in-stream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected

The proposed Salt Control Program elements are only intended to be applicable to salinity water quality objectives associated with the MUN and AGR beneficial uses. Neither of these uses is considered to be an in-stream beneficial use.

Regardless, the implementation of the proposed Salinity Variance Revisions will ensure reasonable protection of all beneficial uses in the long-term. The provisions of the proposed Salinity Variance Revisions are designed to ensure that, regardless of whether surface waters are considered high-quality or not, beneficial uses will be protected through implementation of the Salt Control Program. Furthermore, as described above, the Salinity Variance Revisions will ensure that any change to high quality waters authorized by the Board pursuant to any NPDES permit issued following the adoption of the Salinity Variance Revisions will not unreasonably affect present and anticipated beneficial uses of such water or cause water quality less than water quality objectives in the long-term because any permittee receiving a salinity variance will be required to participate in the implementation of the Salt Control Program.

5.2.3.2 Ensuring that, where the quality of the waters exceeds levels necessary to support the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected unless the State finds that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located

In the case studies for the existing Salinity Variance Program, demonstration was made that a lowering of water quality was necessary to accommodate important economic or social development in the communities in question. The proposed Salinity Variance Revisions require a detailed explanation by the applicant describing why the applicant's situation is similar to the three POTW case studies previously considered in the adoption of the existing Salinity Variance Program. The Central Valley Water Board must evaluate the information provided by the

applicant for a salinity variance and render a finding, through a public hearing process, that a lowering of water quality is necessary in its approval of a salinity variance in an NPDES permit.

5.2.3.3 Ensuring that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control

The proposed Salinity Variance Revisions require that a salinity variance must be authorized by the Central Valley Water Board in relatively the same manner as set forth in the current Salinity Variance Program. That approach requires the applicant for a salinity variance to provide the following information which is pertinent to a showing that the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control shall be achieved:

- A description of the salinity reduction/elimination measures that have been undertaken as of the application date;
- A Salinity Reduction Study Work Plan;
- An explanation of the basis for concluding that there are no readily available or cost-effective methodologies available to consistently attain the WQBELs for the salinity constituent(s) in question;
- A detailed discussion explaining why the applicant's situation is similar to the three POTW case studies examined in the adoption process for the Salinity Variance Program;
- A detailed discussion of proposed interim discharge limitations that represents the highest level of treatment and control that the applicant can consistently achieve during the term of the variance;
- Documentation of the applicant's active participation in the P&O Study; and
- A detailed plan of how the applicant will continue to participate in P&O Study and how the applicant will contribute to the development and implementation of the P&O Study.

Fulfillment of the above responsibilities pertaining to salinity reduction/elimination measures, ongoing salinity reduction activities, demonstration that there are no readily available or cost-effective methodologies to consistently attain WQBELs and a description of the highest level of treatment and control that can be attained demonstrate that the highest statutory and regulatory requirements have been achieved.

5.3 NITRATE CONTROL PROGRAM

5.3.1The Nitrate Control Program

The nitrate water quality objective of 10 mg/L correlates to the primary drinking water maximum contaminant level (MCL), which is designed to protect the beneficial use most sensitive to nitrate impacts, the MUN beneficial use. For discharges that may affect the quality of groundwater, the Board currently requires that permittees, at a minimum, comply with a water quality objective of 10 mg/L in the uppermost surface of saturated subsurface materials (i.e., "first-encountered groundwater"). Compliance with the water quality objective may currently be enforced through the adoption of a variety of permit terms that limit discharges from causing or contributing to a violation of the water quality objective.

However, despite significant advances in wastewater treatment technology, widespread adoption of agricultural practices that reduce nitrogen inputs, and increasing efforts to refine

management practices at concentrated animal facilities, many permittees are unable to consistently meet permit limits designed to protect the MUN beneficial use in groundwater.[106] This has resulted in widespread nitrate pollution in the Central Valley's aquifers. The Nitrate Control Program represents a significant departure from the Central Valley Water Board's existing inadequate permitting approach, with the goal of arresting and rectifying nitrate pollution where it is reasonably feasible to do so. Although additional degradation will occur while the Nitrate Control Program strategies are developed and implemented, impacts due to this degradation will be mitigated through programs designed to provide drinking water to individuals and communities whose wells have been rendered unusable because of nitrate pollution.

Similar to the Salt Control Program, the Nitrate Control Program allows permittees to choose from one of two different permitting pathways: Path A, an individual permitting approach, and Path B, an approach that involves participation in a Groundwater Management Zone. Under Path A, the permitting approach and Board-imposed requirements will vary depending on which of five categories is applicable to the discharge in question, as follows:

[106] Surface water impairments due to nitrate are not recognized as a significant problem in the Central Valley. Thus, the Nitrate Control Program only alters the Board's approach to regulating discharges of nitrogen to groundwater.

Table 5 - 1. Categories of Discharge Quality and Impact to Groundwater

Category	Discharge Quality and Impact to Groundwater
Category 1 No Degradation	Discharge quality, as it reaches the Shallow Zone[107], is better than the applicable water quality objective and is better than the average nitrate concentration in the Shallow Zone.
Category 2 *De Minimis* Impacts	The average nitrate concentration in the Shallow Zone is better than the applicable water quality objective, and, over a 20-year planning horizon: • The effect of the discharge on the average nitrate concentration in the Shallow Zone is expected to use less than 10% of the available assimilative capacity in the Shallow Zone; and • The discharge, in combination with other nitrate inputs to the Shallow Zone, is not expected to cause average nitrate concentrations in the Shallow Zone to exceed a nitrate trigger of 75% of the applicable water quality objective.
Category 3 Degradation Below Trigger	The average nitrate concentration in the Shallow Zone is better than the applicable water quality objective. Estimated that discharge is more than *de minimis*, but will not cause the average nitrate concentration in the Shallow Zone to exceed a trigger of 75% of the applicable water quality objective over a 20-year planning horizon.
Category 4 Degradation Above Trigger	The average nitrate concentration in the Shallow Zone is better than the water quality objective. Though the discharge is reasonably expected to cause the average nitrate concentration in the Shallow Zone to exceed a trigger of 75% of the applicable water quality objective over a 20-year planning horizon, the average nitrate concentration in the Shallow Zone is expected to remain at or below the applicable water quality objective over the same 20-year planning horizon.
Category 5 Discharge Above Objective	Either: • The average nitrate concentration in the Shallow Zone is better than the applicable water quality objective, but the discharge may cause the average nitrate concentration in the Shallow Zone to exceed the water quality objective over a 20-year planning horizon; or, • The average nitrate concentration in the Shallow Zone exceeds the applicable water quality objective and the discharge quality, as it reaches the Shallow Zone, also exceeds the applicable water quality objective.

The Path B permitting approach, on the other hand, is for permittees that decide to meet nitrate requirements of the SNMP by participating in a Groundwater Management Zone. Under Path B, permittees must define areas of the aquifer that have been adversely impacted by their nitrate discharges and must develop plans to address impairments in these areas (Implementation Plans). Implementation Plans must establish a governance structure for participating permittees, ensure that the needs of individuals and communities that depend on the aquifer as their source of drinking water are met, propose Alternative Compliance Projects, where necessary, and, where feasible, balance nitrate inputs and implement long-term projects to rectify groundwater impairments. When evaluating available assimilative capacity for the portion of the aquifer addressed by an Implementation Plan, the Board may look at volume-weighted nitrate

[107] For the purposes of this Table, the "Shallow Zone" is the portion of the aquifer whose areal extent is defined by the boundaries of the discharge area and whose vertical extent is defined by the depth of the shallowest 10% of the domestic water supply wells near the discharge or an equivalent alternative.

concentrations in the upper zone. Assimilative capacity, if it exists, would be defined as the additional nitrate loading that could occur up until the volume-weighted average of nitrate concentrations measured in the upper zone reach the water quality objective. If assimilative capacity is nonexistent, the Board may authorize an Exception that meets the requirements as set forth in the Exceptions Policy. The Implementation Plan, once approved by the Board, would become enforceable through the Board's reissuance or modification of waste discharge requirements.

Permittees regulated under Path A whose discharges will result in the degradation of high-quality waters (certain permittees regulated under Categories 3, 4, and 5) will be required to conduct a antidegradation analysis in connection with their permit application. Permittees that have developed an Implementation Plan that relies on the Board granting available assimilative capacity where the volume-weighted average of water within the upper aquifer exceeds 75% of the nitrate MCL, would need to conduct a comprehensive antidegradation analysis that must include demonstration that "there is sufficient assimilative capacity to ensure that the proposed discharge, together with discharges from participants to the same management zone, including discharges to recharge projects, will not cause the volume-weighted average water quality in the appropriate zone underlying the management zone to exceed the applicable Basin Plan objective(s)."

Under the process described in the proposed Nitrate Control Program, permittees applying for allocation of assimilative capacity that would exceed 75% of the volume-weighted average nitrate MCL would be responsible for explaining/justifying why the assimilative capacity is necessary, state why the permittee is unable to consistently comply with existing effluent limitations or groundwater quality objectives, define areas of the aquifer that have been adversely impacted by nitrate discharges, develop plans to address impairments in these areas, and require permittees to ensure availability of an adequate supply of safe, reliable and affordable drinking water for any persons within the zone of contribution as a condition for authorizing use of the limited assimilative capacity for nitrate. Permittees must also make reasonable efforts to reduce or maintain their nitrogen loading to the greatest extent practicable for the duration of their permit.

5.3.1.1 Modified Exceptions Policy

The Basin Plans currently have an Exception Policy that applies to salts. In addition to eliminating the sunset provision for salts, the proposed revisions to the Exceptions Policy would establish a process by which participating permittees could apply for and implement an exception to otherwise-applicable nitrate limits. The exception may apply to the issuance of effluent limitations and/or groundwater limitations, and thus degradation is likely to occur in many circumstances when the Board grants an exception under the modified Exceptions Policy.

Under the process described in the proposed revisions to the Exception Policy, permittees applying for an exception would be responsible for explaining/justifying why the exception is necessary, state why the permittee is unable to consistently comply with existing effluent limitations or groundwater quality objectives, define areas of the aquifer that have been adversely impacted by nitrate discharges, develop plans to address impairments in these areas, and require permittees to ensure availability of an adequate supply of safe, reliable and affordable drinking water as a condition for authorizing an exception for nitrate. Permittees must also make reasonable efforts to reduce or maintain their nitrogen loading to the greatest extent practicable for the duration of the exception.

The specific nature of these efforts will be identified at the time the exception is authorized in a Board-issued permit or set of permits. Furthermore, as a condition of reauthorizing/renewing an exception, the Board will require permittees to reassess their management practices and survey available treatment technologies to determine if feasible, practicable and reasonable compliance options have become available that were not available at the time of the previous exception approval.

5.3.1.2 Offsets Policy

The Offsets Policy would allow the Central Valley Water Board to approve projects whose aggregate net effect on receiving water quality is functionally equivalent to or better than that which would have occurred by requiring a discharger to comply with its permit at the point of discharge. Instead of determining compliance with applicable water quality objectives in first encountered groundwater in the direct vicinity of the discharge, permittees with an approved offset would perform the Board-approved offset project which, in combination with the existing discharge, would result in a project deemed to be equal to, or better than, the results obtained through application of the current approach. For nitrates, the two most critical limitations placed on offsets is that they do not result in any adverse impacts to local water users and that the overall net effect of the offset is greater than that which would have been realized under permit compliance alone.

Offset projects, by their very nature, will result in localized degradation. However, the conditions placed upon any Board-approved offset, in combination with the implementation placed on the project itself, are expected to result in degradation that will be consistent with the state and federal antidegradation policies as described below. These include conditions requiring that offsets projects be enforceable through permit terms, consistent with any local plans to manage nitrate in the same area, not result in unmitigated localized impairments, and include a monitoring and reporting program sufficient to verify that projected pollution reduction credits are actually realized.

Cross-pollutant pollutant trading, which would have an unknown effect on nitrate water quality degradation, is a concept that was discussed but ultimately not included in the proposed Nitrate Control Program. Offsets projects for nitrates that would mitigate local impacts through projects in far-off basins are likewise not authorized under the proposed Offsets Policy. Lastly, though a drinking water mitigation fund may be considered as an element of an offset proposal to address nitrates, simply paying into a drinking water mitigation is not sufficient to be considered an “offset”; such a proposal must be accompanied by meaningful efforts to reduce nitrate loading.

5.3.2 Consistency with the State Antidegradation Policy

The Nitrate Control Program anticipates that the Central Valley Water Board will revise many permits to incorporate new nitrate requirements based off of a prioritization strategy outlined in Section 4.0. The Nitrate Control Program recognizes that numerous permitting options, both under Path A and Path B, will allow additional nitrate degradation to occur over the short-term. When approving such permits, the Board must find that degradation authorized by the permit is consistent with the maximum benefit to the people of the state, that the degradation will not unreasonably affect present or probable beneficial uses, that the degradation will not result in water quality less than prescribed in applicable water quality control plans or policies, and that the permittee(s) employ treatment or control methods that will result in “best practicable treatment or control” of the wastes in their discharges.

Permits issued by the Board under the Nitrate Control Program will be issued after noticed hearings, and the Board must make findings regarding whether or not permits adopted under the Nitrate Control Program will ensure that all of the conditions of the State Antidegradation Policy are satisfied before the discharge is authorized. The following subsections describe the considerations that will go into the Board's evaluation of any degradation authorized under the Nitrate Control Program.

5.3.2.1 Degradation under the Nitrate Control Program Will Be Consistent with Maximum Benefit to the People of the State

The Nitrate Control Program has been designed to address decades of nitrate impacts that have impaired drinking water sources in many areas of the Central Valley. Under the Nitrate Permitting Strategy, the Board could authorize permittee-proposed projects (including Alternative Compliance Projects) and implementation plans, provided that they would ultimately result in nitrogen balance and aquifer restoration, where reasonable and feasible. However, the proposed Nitrate Control Program would allow the Board to allow nitrate impairments to persist for years, if not decades, in order to prioritize projects that must ultimately result in nitrate load reductions.

This degradation would nonetheless would be consistent with the maximum benefit to the people of the state because, as a condition of the Board's approval of permits to implement the Nitrate Control Program, permittees, either individually or as participants in a Management Zone, must provide alternate water supplies for nitrate-affected individuals and communities while long-term strategies are being implemented. In addition, even before the Central Water Board would approve updated permits or Implementation Plans, permittees electing to participate individually or collaboratively through a management zone must develop Early Action Plans to address immediate drinking water needs for those that rely on groundwater within the zone of contribution of an individual's discharge or within the tentative management zone boundary. Further, implementation measures must include meaningful participation from the communities who are affected by ongoing and legacy nitrogen impairments from the individual discharge or within the boundaries of a Management Zone.

The Nitrate Control Program will require that permittees make substantial and meaningful investments in nitrate reduction strategies and control measures, and granting extended compliance timelines to implement these strategies and control measures helps ensure that regulatory measures do not unreasonably affect the economic vitality of the Central Valley's communities. Because the Nitrate Control Program both addresses the economic well-being of permittees in the Central Valley and mandates that the Board require that Implementation Plans ensure that all affected users will be provided a safe drinking water supply, the degradation that the Board may authorize pursuant to the Nitrate Control Program and the policies designed to effectuate that program is expected to be consistent with the maximum benefit of the people.

5.3.2.2 Degradation that May Occur under the Nitrate Control Program, Including Related Policies, will not unreasonably affect present or probable future beneficial uses of such water

The Nitrate Control Program was designed to meet the SNMP goals of achieving nitrate balance within the affected aquifers and restoring water quality within those aquifers, where restoration is reasonable and feasible, which helps ensure that the Nitrate Control Program does not unreasonably affect existing and probable future beneficial uses. Regardless of whether a permittee is being regulated under Path A or Path B, the first requirement imposed by the

Nitrate Control Program (after a permittee in a prioritized basin receives a Notice to Comply or plans on making a material change to their discharge that increases nitrate in the discharge and subjects them to the Nitrate Control Program) will be for the permittee to conduct an initial assessment of groundwater conditions and to characterize nitrate conditions in their discharge. This assessment and characterization then forms the basis for demonstrating how nitrate in the affected groundwater basin will be managed over the short and long-term to ensure the protection of beneficial uses.

The Nitrate Control Program differentiates between those individual dischargers that threaten to degrade groundwater in a significant manner or that are projected to occur in a heavily-impacted area (Categories 4 and 5) from those that don't threaten to cause degradation that would potentially impair beneficial uses (Categories 1, 2 and 3). For those dischargers that represent a negligible threat of degradation, the Nitrate Control Program sets a margin of safety by establishing triggers at 75% of the objective, further ensuring that present or probable future beneficial uses will be protected.

Permittees that are required to implement Alternative Compliance Projects under Path A (i.e., permittees that fall under Categories 4 and 5) and permittees that have developed Management Zone Implementation Plans under Path B are required to protect beneficial uses through the development of long-term plans to achieve the goals of the SNMP. For example, a minimum requirement of a management zone implementation plan is identification of short (≤ 20 years) and long-term (≥ 20 years) projects and/or planning activities that will be implemented within the management zone, and in particular within prioritized areas (if such areas are identified in the implementation plan), to make progress towards aquifer restoration such that present or probable future beneficial uses are protected. Following the long-term implementation of the Nitrate Control Program, groundwater throughout Management Zones that have been established throughout the priority basis and groundwater in areas where Alternate Compliance Projects have been authorized is expected to meet the drinking water MCL or the highest quality water technically and economically achievable. In this way, the Nitrate Control Program protects present or probable future beneficial uses to the maximum extent practicable.
In cases where nitrate balance and/or restoration is not reasonable or feasible, the Central Valley Water Board may need to evaluate the need to alter beneficial uses. However, such a consideration is a last resort, and only after it has been demonstrated that restoration of the basin in question to meet water quality objectives is in fact not reasonable or feasible.

5.3.2.3 Degradation that may occur under the Nitrate Control Program, including related policies, will not result in water quality less than prescribed in other applicable water quality control plans or policies

The State Antidegradation Policy requires that degradation authorized by the Central Valley Water Board not result in water quality less than prescribed in applicable water quality control plans or policies. As a program that will be implemented through amendments to the Central Valley Water Board's water quality control plans, degradation authorized under the Nitrate Control Program will be consistent with the water quality control plan. Consistency with other policies is analyzed in section 6.0 of this Staff Report.

Even absent the new provisions of the Nitrate Control Program, the Board is authorized to allow permittees time to rectify management practices that are insufficient to result in compliance with water quality objectives, provided that those time schedules are as short as practicable. The compliance time schedules authorized under the Nitrate Control Program are well within the Board's statutory authority and consistent with all applicable policies. Ultimately, the

requirements in the Nitrate Control Program, as implemented through the Board's issuance of permits to effectuate the program, will ensure that any changes to high quality waters will not result in water quality less than water quality objectives when evaluated and considered over the long-term.

5.3.2.4 Degradation under the Nitrate Control Program will be limited by the requirement that discharges to high-quality waters implement BPTC

The Central Valley Water Board's establishment of the Nitrate Control Program, including the revisions to the Exceptions Policy and the Offsets policy, will not, on its own, authorize or cause any degradation of high-quality waters. However, implementation of the Nitrate Control Program through the Board's issuance of WDRs or Conditional Waivers pursuant to the Nitrate Control Program may result in water quality degradation over and above that which the Central Valley Water Board could authorize pursuant to currently applicable Basin Plan provisions. However, when approving the WDRs and/or Conditional Waivers, the Board must find that the treatment or control methods that will be employed by the permittees while they implement the permit requirements will result in "best practicable treatment or control" of the wastes in their discharges.

Similar to the Salt Control Program, the Nitrate Control Program differs from the Board's current permitting approach in that it would allow the Board to consider the "practicability" of the actions undertaken by individual permittees developing and implementing Alternative Compliance Projects or by groups of permittees developing and implementing Management Zone Implementation Plans. In other words, if the Board was considering WDRs for two individual facilities on a permit-by-permit basis, it would need to evaluate whether each individual facility was implementing pollution or control methods that were "best practicable treatment or control" based on the financial and technical capacities of each of the facilities on its own. Under the traditional permitting approach, if the two facilities found that it might be practicable for them to collectively finance a pollution treatment methodology that would reduce pollutant loadings to a greater degree than each could individually afford on their own, there would still be some ambiguity as to whether the Board could consider this alternative the "best practicable treatment or control" alternative.
Even though the Board could take a broader view of "best practicable treatment or control" when evaluating treatment or control methodologies proposed in Alternative Compliance Projects or Management Zone Implementation Plans (as well as any permit amendments adopted to effectuate such projects or plans), the Nitrate Control Program would not obviate the need for the Central Valley Water Board to hold a public hearing and carefully consider whether the project or plan actually describes actions, infrastructure, and methodologies that would be considered the best practicable treatment or control for the nitrates in the permittees discharge. Furthermore, in authorizing degradation through the approval of an Implementation Plan, the Board would need to make the necessary findings consistent with the State's Antidegradation Policy to authorize degradation of any high quality water.

5.3.3 Consistency with the Federal Antidegradation Policy

The Nitrate Control Program solely geared towards rectifying and addressing issues related to nitrates in groundwater therefore the Federal Antidegradation Policy does not apply.

5.4 SECONDARY MCLS

Maximum Contaminant Levels (MCLs) are designed to protect public welfare and health by setting standards for drinking water supplied to the public. State and federal drinking water regulations require that most surface waters be filtered and disinfected prior to being served to the public, unless an exemption to filtration requirements has been granted. Secondary MCLs (SMCLs) are designed to protect the aesthetic quality (taste, odor and appearance) of drinking water (i.e. the MUN beneficial use), and are identified in section 64449 (Tables A and B) of Title 22 of the California Code of Regulations (Title 22) and were developed to protect public welfare and consumer acceptance by addressing aesthetic qualities and not intended to address public health[108]. The Board prospectively incorporated the primary and secondary MCLs into the Basin Plans' Chemical Constituents water quality objective, but neglected to fully incorporate explanatory language from Title 22. The components of the proposed Basin Plan Amendments that affect SMCLs (SMCL Revisions) would revise the Basin Plans to clarify the intent and use of applying the SMCLs in permitting actions.

The SMCL Revisions would address two types of SMCLs: those associated with salinity, and those associated with other types of constituents in Table 64449-A of Title 22. For salinity constituents, the proposed revisions would clarify how the Board will apply values within those ranges as water quality objectives, consistent with the intent of Title 22.The proposed revisions would state that permit limits are to be derived based a on a filtered water sample for SMCLs pertaining to aluminum, color, copper, iron, manganese, silver, turbidity and zinc unless receiving waters in question have been exempted from filtration requirements in the Enhanced Surface Water Treatment Rule (otherwise, compliance with SMCLs is to be evaluated using an unfiltered samples). Both revisions are consistent with the Board's current permitting practices, and thus, degradation is expected to be negligible following the adoption of the SMCL Revisions.

5.4.1 Degradation that may occur under the SMCL Revisions

The Board currently requires that permittees that discharge constituents identified in Tables 64449-A and 64449-B comply with water quality objectives specified in these tables. Compliance with the water quality objectives may currently be implemented through the adoption of effluent limitations, or through the adoption of receiving water limits that limit discharges from causing or contributing to a violation of the water quality objective in the receiving water. The proposed revisions will not result in a change in the character of current discharges related to the Secondary MCL constituents. They instead provide a process that will clarify ambiguities that could otherwise require the Board to prescribe overly restrictive requirements that would require facility upgrades or other costly measures where such changes are not needed to ensure water quality is protected.

5.4.2 Consistency with the State Antidegradation Policy

The Central Valley Water Board's adoption of the proposed SMCL Revisions itself will not authorize or cause any degradation of high-quality waters, and implementation of the SMCL Revisions through the Board's issuance of WDRs or conditional waivers would not result in

[108] Primary Maximum Contaminant Levels (MCLs) are mandatory water quality standards for drinking water contaminants. These are enforceable standards called which are established to protect the public against consumption of drinking water contaminants that present a risk to human health. These apply to drinking water which is delivered to the consumer. These proposed amendments do not revise alter or delete the incorporation of Primary MCLs into the Central Valley Water Board's Basin Plans and do not alter or change how the Central Valley Water Board implements the Primary MCLs through its regulatory actions.

water quality degradation over and above that which the Central Valley Water Board could authorize pursuant to currently applicable Basin Plan provisions. As indicated previously, the SMCL Revisions is intended to clarify the Board's approach and existing authority.

To the extent that a permittee would request revisions of its permit based on the SMCL Revisions, the SMCL Revisions would not obviate the need for the Central Valley Water Board to hold a public hearing and carefully consider whether the proposed permit actually describes actions, infrastructure, and methodologies that would be considered the best practicable treatment or control of salinity and other SMCL constituents necessary to ensure that no pollution or nuisance will occur and the highest water quality consistent with the maximum benefit to the people of the State will be maintained.

5.4.3 Consistency with the Federal Antidegradation Policy

Consistent with the provisions of the federal Antidegradation Policy, which is applicable to the regulation of discharges to navigable surface waters of the United States, the following additional requirements are applicable to the proposed SMCL Revisions:

1) Existing in-stream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected.

2) Where the quality of the waters exceeds levels necessary to support the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected unless the State finds, after full satisfaction of the intergovernmental coordination and public participation provisions of the State's continuing planning process, that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. In allowing such degradation or lower water quality, the State shall assure water quality adequate to protect existing uses fully. Further, the State shall assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control.

5.4.3.1 Defining the Process by which the Board will ensure that existing in-stream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected following adoption of the proposed SMCL Guidance.

The proposed SMCL Revisions provisions apply only to water quality objectives associated with the MUN beneficial use. This use is not considered to be an in-stream beneficial use. Regardless, the implementation of the proposed SMCL Revisions will ensure the reasonable protection of all beneficial uses, as is currently required under the existing Basin Plan language; the SMCL Revisions are consistent with existing permitting practices, and will not eliminate the requirement that the Central Valley Water Board to hold a public hearing and carefully consider whether the proposed permit actually describes actions, infrastructure, and methodologies that would be considered the best practicable treatment or control of salinity and other SMCL constituents necessary to ensure that no pollution or nuisance will occur and the highest water quality consistent with the maximum benefit to the people of the State will be maintained.

5.4.3.2 Defining the Process by which the Board will ensure that, where the quality of the waters exceeds levels necessary to support the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected unless the State finds that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located.

In the adoption of NPDES permits, WDRs or Conditional Waivers which implement SMCLs in surface waters in accordance with the proposed SMCL Revisions, the Board must find that a lowering of water quality is necessary to accommodate important economic or social development in the communities in question. The proposed SMCL Revisions require the development of information to demonstrate consistency with federal antidegradation policies. The Central Valley Water Board must evaluate the information provided by the permittee and render a finding, through a public hearing process, that a lowering of water quality is necessary in its approval of effluent limitations and/or receiving water limitations.

5.4.3.3 Defining the Process by which the Board will ensure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control.

The existing permitting processes for issuing NPDES Permits for discharges to surface waters and for issuing non-NPDES Permits for surface water discharges and for discharges that may affect groundwater currently incorporate processes to ensure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint sources. The proposed SMCL Revisions will not alter such considerations.

5.5 LIMITATIONS

The antidegradation analysis is for the programmatic level commensurate with the development of the SED for the Preferred Alternative. There is no ability at the current time to evaluate any particular project that may occur as a result of implementing the elements of the proposed strategies, policies, and guidance. However, antidegradation analyses will be performed as specific projects and discharge conditions warrant.

6 CONSISTENCY WITH LAWS, PLANS, AND POLICIES

Proposed changes to the Board Basin Plans must be consistent with state laws and regulations, including adopted State and Central Valley Water Board policies, and, to the extent applicable, the federal CWA regulations implemented by the State and Central Valley Water Boards. This chapter summarizes existing federal and state laws and policies that are relevant to the proposed Basin Plan Amendments. Federal regulations apply to surface waters of the United States. State regulations apply to all waters of the state, which includes both groundwater and surface waters.

As applicable, the sections in this chapter may address the proposed Basin Plan Amendments as a whole or with more specific focus on the relevant components of these amendments.

6.1 CONSISTENCY WITH FEDERAL AND STATE LAWS

Federal agencies have adopted regulations implementing federal laws to which Central Valley Water Board actions must conform. To maintain consistency with the NPDES program, the following Federal laws were evaluated for the proposed Basin Plan Amendments:

- Clean Water Act
- Federal & State Endangered Species Acts (16 U.S.C. § 1531 et seq., Fish and G. Code §2050-2116 et seq.)

Consistency of the proposed Basin Plan Amendments to these laws are described in the following sections in addition to state law.

6.1.1 Clean Water Act

6.1.1.1 Federal Requirements for Review of Water Quality Standards

Under section 303(c) of the CWA, water quality standards adopted by a State that affect waters of the United States are subject to USEPA approval. Water quality standards consist of the designated uses and the water quality criteria to protect these uses. (33 USC § 1313, subd. (c)(2)(A) and 40 CFR § 131.3, subd. (i).) When designating new or revised uses, the State must take into consideration the use and value of water for public water supplies, protection and propagation of fish, shellfish and wildlife, recreation in and on the water, agricultural, industrial, and other purposes including navigation. (40 CFR § 131.10, subd. (a).) States may adopt sub-categories of a use and set the appropriate criteria to reflect varying needs of such sub-categories of uses. (40 CFR § 131.10, subd. (c).) States may remove a use that is not an existing use if it demonstrates attaining the use is not feasible because of one of the six factors listed in Section 3.2.1 (40 CFR § 131.10 subd. (g).)

The proposed Basin Plan Amendments do not designate, remove or revise beneficial uses. Therefore, these federal requirements are not applicable to the proposed amendments.

6.1.1.2 Federal Regulations Pertaining to NPDES Permits

Section 402 of the CWA requires a permitting system which USEPA addressed by promulgating 40 CFR Part 122, which are the regulations pertaining to the NPDES program. The State's regulations pertaining to NPDES permits must be consistent with the federal regulations. Title 40 Code of Federal Regulation section 122.44(d)(1)(ii) sets forth the regulations for determining whether a discharge has a reasonable potential to cause or contribute to a violation of water quality standards. It states, "When determining whether a discharge causes, has the reasonable

potential to cause, or contributes to an in-stream excursion above a narrative or numeric criteria within a State water quality standard, the permitting authority shall use procedures which account for existing controls on point and nonpoint sources of pollution, the variability of the pollutant or pollutant parameter in the effluent, the sensitivity of the species to toxicity testing (when evaluating whole effluent toxicity), and where appropriate, the dilution of the effluent in the receiving water."

The proposed Basin Plan Amendments do not recommend any new or modification to federal or state NPDES permitting procedures, with the exception of the modifications to the variance policy, discussed below, and the new language pertaining to the use of filtration in the evaluation of Secondary MCLs ("for a period of no more than 10 years or upon development of a translator, reasonable potential analysis will be conducted based on dissolved metals data using a 0.45-micron filter in accordance with Federal Regulations, 40 CFR Part 136.") This would standardize considerations that are currently being made by the Central Valley Water Board on a case-by-case basis. During Phase 1 of the Salt Control Program, interim limits in the Drought and Conservation Policy are proposed for use as interpretation of the narrative water quality objectives when setting water quality based effluent limits under the Variance Policy. These Basin Plan Amendments are consistent with federal and state NPDES procedures and depend on the continued implementation of these procedures to provide appropriate protection to surface waters of the United States.

6.1.1.3 Federal Regulations Pertaining to Water Quality Variances

States may adopt water quality standards variances, as defined in 40 C.F.R § 131.3(o). A water quality standards variance is a water quality standard subject to EPA review and approval or disapproval in accordance with 40 C.F.R. 131.10. The criteria for USEPA's approval or disapproval of a water quality standards variance is found at 40 C.F.R. 131.14. The following are the relevant elements of USEPA's approval criteria, which are met by the proposed modifications to the Variance Policy:

i. *It is infeasible to meet a water quality-based effluent limit (WQBEL) that is as stringent as necessary to meet the applicable WQS but may be feasible to meet such a WQBEL in the future (80 FR 51020).*

   The Variance Policy established by the revisions require a demonstration that the facility seeking the variance is in a situation similar to those facilities evaluated as a part of the Board's consideration of Resolution R5-2014-0074, the existing salinity Variance Policy (i.e., salt management strategies were being implemented by the POTW, but further reductions were not possible without causing substantial and widespread socioeconomic impacts related to implementation of pollution controls necessary to meet water quality standards, such as reverse osmosis treatment).

ii. *The underlying use and criterion are retained, and all other water quality standards not specifically addressed by the variance continue to apply (40 CFR 131.14(a)(2)).*

   The revisions to the Variance Policy to not change the underlying use and criterion, and all other water quality standards will continue to apply.

iii. *Establishment of the revisions to the variance policy will not result in any lowering of currently attained ambient water quality (40 CFR 131.14(b)(1)(ii)).*

   As a criteria for meeting the conditions for the Board to issue a salinity variance, the permittee must be subject to performance-based limits designed to maintain existing ambient water quality, to the extent practicable.

iv. *The variance will be the applicable standard for purposes of developing NPDES permit limits and requirements only for the permittee(s) specified in the WQS variance (40 CFR 131.14(a)(3)).*

The variance policy established by the revisions is a multi-discharger variance program that contains eligibility requirements that make clear what characteristics a permittee must have in order to be subject to the WQS variance. The facilities covered by the WQS variance will have their permits posted on the Central Valley Water Board's website.

v. *Establishment of the variance policy, and the periodic reevaluation thereof, will meet public participation requirements at § 131.20(b) (40 CFR 131.14)), the term of the WQS variance that is only as long as necessary to achieve the highest attainable condition (40 CFR 131.14(b)(1)(iv)), and a commitment that the Variance Policy will be evaluated at least once every 5 years (40 CFR 131.14(b)(1)(v)).*

The revised Variance Policy includes a variance term and includes provisions for reviewing variances during triennial reviews. The triennial review is a public process that meets applicable federal regulatory requirements.

vi. *The identity of the pollutant(s) or water quality parameter(s) to which the WQS variance applies (40 CFR 131.14(b)(1)(i)).*

The salinity constituents that may be subject to the variance are defined in the revised Variance Policy.

vii. *A highest attainable condition specified as a quantifiable expression in one of the following ways (40 CFR 131.14(b)(1)(ii)(A)(1-3)): a highest attainable interim criterion; or an interim effluent condition that reflects the greatest pollutant reduction achievable, or specific eligibility requirements in the WQS variance*

The revisions to the Variance Policy will require permittees to continue to implement all practicable means (salinity source reduction, evaluations of industrial sources, etc.) of reducing salinity and will subject permittees to performance-based limits during the time the variance is operative.

viii. *A provision specifying that if the state does not complete a reevaluation at the specified frequency or does not submit to EPA the results of a reevaluation within 30 days of completion of the reevaluation, the underlying designated use and associated criterion, rather than the WQS variance, will be the applicable water quality standard for CWA purposes until such time the state completes and submits the reevaluation to EPA (40 CFR 131.14(b)(1)(vi)).*

Such a statement has been included in the revised Policy.

6.1.1.4 Requirements for Avoiding Wetland Loss

Under CWA section 404 and the Rivers and Harbors Act of 1899 Section 10, alteration of waterways, including wetlands that affect navigable waters requires a permit from the Federal government and assurance that impacts will be avoided or mitigated. The U.S. Army Corps of Engineers operates the 404 permit program with a goal of achieving "no net loss" of wetlands. For projects proposing unavoidable impacts on wetlands, compensatory mitigation in the form of replacing the lost aquatic functions is generally required. Under authority of CWA section 401, the State also reviews federally authorized projects, including permits issued by the US Army Corps of Engineers for dredge and fill activities under CWA section 404 and construction

permits issued under Section 10 of the Rivers and Harbors Act that could have water quality impacts on jurisdictional water bodies.

The proposed Basin Plan Amendments will not adversely affect or have net loss to current wetlands. The amendments do not directly involve the construction of new buildings, services, or other facilities by the Central Valley Water Board that would change the landscape and impact wetlands. Therefore, these laws and regulations pertaining to wetland loss are not applicable to the proposed Basin Plan Amendments. Construction of any project for an out-of-valley salinity solution may require wetland mitigation and/or permits under Clean Water Act section 404 and Section 10 of the Rivers and Harbors Act. Any impacts to wetlands will be considered and evaluated when those projects are proposed, or when the Basin Plans are amended once those projects are known.

6.1.2 Federal and State Endangered Species Act

The Federal Endangered Species Act of 1973 (16 U.S.C. § 1531 et seq.) was established to identify, protect and recover imperiled species and the ecosystems upon which they depend. It is administered by the Interior Department's U.S. Fish and Wildlife Service (USFWS) and the Department of Commerce's National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS). The USFWS has primary responsibility for terrestrial and freshwater organisms, while the NMFS has primary responsibility for marine species such as salmon and whales. In addition, the State of California enacted the California Endangered Species Act (Fish & G. Code, §2050-2116 *et seq*.), which is administered by the California Department of Fish and Wildlife and similarly requires that the State maintain lists of rare, threatened and endangered species.

As discussed in the Environmental Checklist (Appendix K, Section IV, Biological Resources), the proposed amendments would not change the biological resources-related beneficial use designations (e.g., WARM, COLD, WILD, BIOL, RARE, MIGR, SPWN) or associated water quality objectives, or implementation programs related to these beneficial uses or objectives. Any new surface water discharges or substantial changes to existing discharges must be reviewed by the Board before any permit is granted. The proposed amendments do not alter the Board's responsibility to evaluate information provided by the permittee and render a finding, through a public hearing process, if a lowering of water quality is necessary in its approval of effluent limitations and/or receiving water limitations in an NPDES permit, WDR, or Conditional Waiver.

These proposed amendments also do not prevent the Board from establishing more conservative permit limitations or site-specific objectives to protect endangered species as applicable. For example, although the salinity permitting strategy focuses on protection of the salt-sensitive AGR and MUN beneficial uses, there may be areas in the Central Valley where the aquatic life beneficial use may be an additional consideration. Select species of fish (green and white sturgeon as well as striped bass) are sensitive to elevated salinity concentrations, especially during spawning (Klimley, et al., 2015). The spawning habitat of green sturgeon, which is listed as a threatened species on the federal Endangered Species Act list, is known to be contained within the Delta and the Sacramento River Basin (Klimley, et al., 2015). As such, discharges to these areas may be subject to salinity limitations lower than those established for AGR and MUN in order to protect applicable aquatic life beneficial uses.

In addition, the proposed Basin Plan Amendments do not directly involve the construction of new buildings or other facilities. Thus, these amendments would have no direct impact on the quality or quantity of habitat for any fish or wildlife species, including rare or endangered plant or animal species. However, projects that may be constructed as a result of implementation of the

proposed Basin Plan Amendments may result in altered instream flow patterns (e.g., on-farm recharge projects) or new discharges to surface waters (e.g., brine line discharges to San Francisco Bay) may result in indirect impacts to biological resources. A separate project-specific environmental review would be performed prior to project construction and operation to identify project-specific environmental impacts and to incorporate any necessary measures to avoid, reduce, or mitigate for any identified significant environmental impacts. For examples, should future projects include use of federal funds, require a Clean Water Act 404 permit issued by the U.S. Army Corps of Engineers or in another way involve a federal agency, then federal agency consultation under Section 7 of the federal endangered species act (ESA) may be required prior to implementation of projects. This ESA consultation would further ensure that the development or implementation of a project will not result in a take of ESA-listed species.

In conclusion, the proposed Basin Plan Amendments are not expected to affect special status fish and wildlife and are therefore consistent with the Federal and State Endangered Species Acts.

6.1.3 Consistency with Water Code section 106.3

Water Code section 106.3 states that it is the policy of the State of California that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes. Water Code section 106.3 states, in relevant part, that:

a. It is hereby declared to be the established policy of the state that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes.

b. All relevant state agencies, including the department, the state board, and the State Department of Public Health, shall consider this state policy when revising, adopting, or establishing policies, regulations, and grant criteria when those policies, regulations, and criteria are pertinent to the uses of water described in this section.

Related resolutions supporting this policy were adopted by the State Water Board (Resolution No. 2016-0010) and Central Valley Water Board (Resolution No. R5-2016-0018).

The Salt and Nitrate Control Program is built on achieving the following prioritized Central Valley Region management goals for salt and nitrate:

Goal 1: Ensure a safe drinking water supply.

Goal 2: Achieve balanced salt and nitrate loadings, where reasonable and feasible.

Goal 3: Implement managed aquifer restoration program, where reasonable and feasible.

These management goals recognize the need to focus limited resources first on health risks associated with unsafe drinking water. Subsequent goals will require longer implementation timelines and include balancing salt and nitrate loading and restoring water quality, where reasonable and feasible. The proposed Basin Plan Amendments are consistent with Water Code section 106.3 in a number of different ways, as described in the applicable categories below:

- Salt Control Program – The implementation of the proposed Salt Control Program over the long-term will ensure the reasonable protection of all beneficial uses, including the MUN beneficial use, as is currently required under the existing Basin Plans. Permittees

that select the Conservative Pathway will be required to meet strict salinity water quality limitations that are protective of municipal and domestic supply in waterbodies designated with the MUN use. Permittees that select the Alternative Compliance Pathway will be required to maintain current discharge levels of salinity while participating in the Prioritization and Optimization study, which will convert current conceptual salinity management projects into feasibility studies for long-term management of salinity in the Central Valley.

- Nitrate Control Program – To meet Central Valley nitrate management goals, the Nitrate Control Program establishes new nitrate management requirements applicable to permittees that discharge nitrates to groundwater. To meet program requirements that focus on three goals: (1) ensuring a safe drinking water supply is available for users relying on groundwater for their water supply; (2) establishing a nitrate balance (where reasonable and feasible); and (3) developing and implementing a long-term plan for restoration of groundwater (where reasonable and feasible) and pathways to meet the nitrate water quality objective. Under both of the compliance pathways, permittees must assess nitrate levels in groundwater. Permittees responsible for adverse nitrate impacts to drinking water users must ensure the provision of safe drinking water.
- Conditional Prohibition for Salt and Nitrate – Proposed amendments provide assurance that drinking water supplies will be protected from degradation if permittees do not respond to and/or participate in the requirements of the Salt and Nitrate Control Program through the use of a conditional prohibition. For the Nitrate Permitting Strategy, these requirements include the early participation in the implementation of EAPs for certain categories of discharges until permits can be amended to include short and long-term solutions.
- Secondary MCL Policy – Secondary MCLs are drinking water standards to protect the odor, taste, and appearance of drinking water. The Secondary MCL Policy incorporates language that clarifies the use of upper and short-term values for TDS, EC, chloride and sulfate as water quality objectives. It sets recommended values as goals and allows for upper and short-term values to be used consisted with Title 22. In addition, it provides language regarding compliance with the chemical constituent water quality objective using filtered samples analyzed for total fractions to better reflect treatment practices prior to distribution to consumers for the following: aluminum, MBAs, color, copper, iron, manganese, silver, turbidity and zinc. The additional language is more restrictive than the Board's current practice of evaluating compliance based on dissolved fraction of the constituents. However, as described in the Environmental Checklist (Appendix K, Section IX, Hydrology and Water Quality), there would be no substantial degradation of water quality for these constituents upon adoption and implementation of the Secondary MCL Guidance.

- Drought and Conservation Policy –The proposed amendments for the Drought and Conservation Policy pertain only to salinity discharges and are intended to provide permitting procedures to be applied to account for emergency situations that diminish higher quality water supplies such as drought and climate change, and/or constituent increases directly related to voluntary and/or mandatory conservation measures and increased recycling efforts. Any interim effluent and/or groundwater/surface water limitations will need to go through an antidegradation analysis before they are incorporated as permit terms. To protect the MUN beneficial use, these limitations will not exceed the short-term secondary MCL for salinity as a 30-day running average. Interim limitations for conservation efforts shall be based on either not exceeding the

receiving water concentration and not causing down gradient impacts or maintaining TDS loading consistent with historical load (with consideration given to reasonable increment of use or change in source water salinity concentration) while not exceeding the short-term secondary MCL.

- Offsets Policy – The Offsets Policy proposes to allow permittees to use offset projects within the same groundwater basin, subbasin or management zone toward compliance with WDRs for a given pollutant, allowing consideration of the net effect of the discharge and the offset project on groundwater quality. As a condition of approval and implementation, the discharge plus an offset project cannot result in unmitigated localized impairments to sensitive areas, especially drinking water supply wells, nor have a disproportionate impact on a disadvantaged community.

- Exceptions Policy – The current Salinity Exception Program applies to EC, TDS, chloride, sulfate, and sodium. The Exceptions Policy proposes to expand the program to include nitrate and boron. Nitrate is the only constituent that has a primary MCL and is a human health drinking water concern. To address any degradation of drinking water supplies due to nitrate, permittees would be required to ensure availability of an adequate supply of safe, reliable, and affordable drinking water as a condition of obtaining an exception for nitrate. This assurance must include a credible and realistic framework to construct/install a permanent long-term solution and an immediate commitment to make available temporary replacement water. Salinity exceptions are only eligible to participants in the Prioritization and Optimization Study during Phase 1 of the Salt Control Program, when the conceptual models developed during the CV-SALTS initiative will be converted into local and region-wide feasibility studies, thereby laying the groundwork for the long-term management strategy.
- Variance Policy – these related amendments pertain only to point-sources discharges of salinity to surface waters and propose to amend the existing policy to allow for authorization of variances up to 15 years after the Basin Plan effective date. This policy allows the Board the authority to grant short-term exceptions from meeting water quality based effluent limitations to discharges subject to NPDES permits. Variances will only be eligible to participants in the Prioritization and Optimization Study during Phase 1 of the control program. As such, use of these exceptions in the short-term will support the development and implementation of long-term salinity management solutions for the Central Valley that protect designated beneficial uses, including the MUN use.

In conclusion, these proposed Basin Plan Amendments are protective of the MUN beneficial use because they promote the balancing of salt and nitrate discharges and the restoration of aquifers used as a source of drinking water. The proposed Basin Plan Amendments are therefore consistent with Water Code section 106.3 and the resolutions listed above.

6.1.4 Sustainable Groundwater Management Act

The Sustainable Groundwater Management Act, which went into effect January 1, 2015, gives local agencies the authorities to manage groundwater in a sustainable manner and allows for limited state intervention when necessary to protect groundwater resources. See Section 3.7.3 for more information.

These proposed Basin Plan Amendments are consistent with this policy through the use of Management Zones for nitrate management and the requirement for coordination with existing Groundwater Sustainability Agencies (GSAs). In general, a Management Zone would consist of

multiple parties, including but not limited to, permittees and local entities working collectively to first ensure safe drinking water, then to manage nitrates to create a balance within the defined management area (where reasonable and feasible), and ultimately to develop and implement a long-term plan for restoration of groundwater (where reasonable, feasible and practicable) to meet applicable water quality objectives. As part of both Paths A and B of the Nitrate Permitting Strategy, Early Action Plans (EAPs) are required if public water supply or domestic wells in the area of contribution are contaminated by nitrate. EAPs must include a process to coordinate with stakeholders within the zone of influence of the Management Zone, including local GSAs. The Guidelines for Alternative Compliance Plans (see Appendix H) also stipulate that the development of a governance framework should include any identified GSAs within the zone of influence of the Management Zone.

6.1.5 Assembly Bill 32 – California Global Warming Solutions Act

Assembly Bill (AB) 32 is a California State Law that fights global warming by establishing a comprehensive program to reduce greenhouse gas emissions. AB 32 is largely implemented by the California Air Resources Board, which has been directed by AB 32 to adopt regulations to achieve cost-effective GHG emission reductions, thereby mitigating the risks associated with climate change, while improving energy efficiency and expanding the use of renewable energy resources.

The Water Boards are committed to the adoption and implementation of effective actions to mitigate greenhouse gas emissions and to adaptation of our policies and programs to the environmental conditions resulting from climate change. In establishing the proposed Basin Plan Amendments, potential impacts of climate change were evaluated and noted to cause more frequent extended dry periods, additional recycling, conservation and reuse, and reduction in availability of assimilative capacity. To address the potential impacts to salinity discharges, the proposed Basin Plan Amendments include the following policy:

- Drought and Conservation Policy – adjusted salinity WQOs during drought periods to allow permittees more flexibility to reuse and conserve limited water resources which typically increases salinity concentrations.

6.2 CONSISTENCY WITH STATE WATER BOARD POLICIES

The State Water Board is authorized to adopt state policy for water quality control. (Wat. Code §13140.) State Water Board water quality control plans supersede any regional water quality control plans for the same waters to the extent of any conflict. (Wat. Code §13170.) The following are the State Water Board plans and policies:

- State Policy for Water Quality Control
- State Water Board Resolution 68-16, the Statement of Policy with Respect to Maintaining High Quality of Waters in California (State Antidegradation Policy)
- Policy and Action Plan for Water Reclamation in California
- Water Quality Control Policy for the Enclosed Bays and Estuaries of California
- Sources of Drinking Water Policy
- Pollutant Policy Document
- Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code section 13304
- Consolidated Toxic Hot Spots Cleanup Plan

- Nonpoint Source Management Plan & the Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program
- Water Quality Enforcement Policy
- Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California
- Policy for Developing California's CWA Section 303(d) list (Listing Policy)
- Water Quality Control Policy for Addressing Impaired Waters: Regulatory Structure and Options
- Policy for Compliance Schedules in Nation Pollutant Discharge Elimination System Permits
- Onsite Wastewater Treatment Systems Policy
- Policy for Water Quality Control for Recycled Water
- Human Right to Water as a Core Value and Directing its Implementation in Water Board Programs and Activities
- The Division of Drinking Water's "Extremely Impaired Sources Policy"

6.2.1 State Policy for Water Quality Control

Adopted in 1972, this policy declares the State Water Board's intent to protect water quality through the implementation of water resources management programs and serves as the general basis for subsequent water quality control policies.

The proposed Basin Plan Amendments do not change how the state will implement water resources management programs or water quality control policies.

6.2.2 State Water Board Resolution 68-16, the Statement of Policy with Respect to Maintaining High Quality of Waters in California (*State Antidegradation Policy*)

- Resolution 68-16

See Section 5 for a discussion of this policy and the Antidegradation Analysis of the proposed amendments.

6.2.3 Water Quality Control Policy for the Enclosed Bays and Estuaries of California

- Resolution 74-43
- Resolution 95-84

This policy was adopted by the State Water Board in 1974 and updated in 1995. This policy provides water quality principles and guidelines for the prevention of water quality degradation in enclosed bays and estuaries to protect the beneficial uses of such waters. The Regional Water Boards must enforce the policy and take actions consistent with its provisions. For the San Francisco Bay-Delta system, the policy requires implementation of a program which controls toxic effects through a combination of source control for toxic materials, upgraded waste treatment, and improved dilution of wastewaters to provide full protection to the biota and the beneficial uses of San Francisco Bay-Delta waters.

The proposed Basin Plan Amendments do not eliminate or contradict the core requirement of the Water Quality Control Policy for the Enclosed Bays and Estuaries of California that the Central Valley Water Board ensure that persistent or cumulative toxic substances be removed from waste discharges to the maximum extent practicable through source control or adequate

treatment. Furthermore, the proposed Basin Plan Amendments do not change the Bay-Delta WQOs. Therefore, the proposed Basin Plan Amendments are consistent with this policy.

6.2.4 Policy and Action Plan for Water Reclamation in California

- Resolution 77-1

This policy was adopted on 6 January 1977. Because reclamation provides an alternative source of water suitable for irrigation, reuse is encouraged by the State Water Board. The policy also encourage water conservation and calls for other agencies to assist in implementation.

The proposed Basin Plan Amendments will not restrict reclamation and in fact encourage water conservation and reuse. The implementation of the SMCL policy allows reuse of water up to the upper limits recommended by Title 22 as long as downgradient/downstream water is not impacted (consistent with Antidegradation Analysis findings). Also, the Drought and Conservation Policy supports reuse when water supplies are limited.

6.2.5 Sources of Drinking Water Policy

- Resolution 88-63
- Resolution 2006-0008
- Resolution 2015-0002

See description in Section 3.1.3

The proposed Basin Plan Amendments will not change the MUN beneficial use designations for water bodies in the Central Valley and are therefore consistent with this policy.

6.2.6 Pollutant Policy Document

- Resolution 90-67

This policy, adopted in 1990, requires in part, that the Central Valley and San Francisco Bay Water Boards use the Pollutant Policy Document (PPD) as a guide to update portions of their Basin Plans. The PPD requires that the Central Valley Water Board develop a Mass Emissions Strategy (MES) for limiting loads of pollutants from entering the Delta. The purpose of the MES is to control the accumulation in sediments and the bioaccumulation of pollutant substances in the tissues of aquatic organisms in accordance with the statutory requirements of the state Porter-Cologne Water Quality Act and the Federal C.

The proposed Basin Plan Amendments primarily address salt and nitrate, which do not increase the accumulation of pollutants in sediment or bioaccumulation of pollutant substances in tissues of aquatic organisms. Changes to the WQOs and implementation of Secondary MCLs are specific to the protection of the MUN beneficial use and do not change criteria protective of aquatic life. Therefore, these amendments are consistent with this policy.

6.2.7 Policies and Procedures for Investigation and Cleanup and Abatement of Discharges under Water Code section 13304

- Resolution 92-49

- Resolution 94-49
- Resolution 96-79

The State Water Board adopted this policy in 1992 and updated this policy in 1994 and 1996. This policy contains procedures for the Central Valley Water Board to follow when issuing orders pursuant to Water Code section 13304 that require the cleanup of discharges of wastes that have impacted, or that threaten to impact, waters of the state.

The proposed Basin Plan Amendments do not change or circumvent the applicable procedures pertaining to cleanup and abatement activities. Therefore, the proposed Basin Plan Amendments are consistent with this policy.

6.2.8 Consolidated Toxic Hot Spots Cleanup Plan

- Resolution 99-065
- Resolution 2004-0002

As required by Water Code section 13394, the Consolidated Toxic Hot Spots Cleanup Plan (Cleanup Plan) was adopted by the State Water Board in June 1999 and updated in 2004.

The proposed Basin Plan Amendments do not address any toxic hot spot constituents needing cleanup plans. Therefore, the Cleanup Plan is not applicable.

6.2.9 Nonpoint Source Management Plan & the Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program

- Resolution 99-114
- Resolution 2004-0030

In December 1999, the State Water Board adopted the Plan for California's Nonpoint Source (NPS) Pollution Control Program (NPS Program Plan) and in May 2004, the State Water Board adopted the Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program (NPS Policy). The NPS Policy explains how State and Central Valley Water Boards will use their administrative permitting authority under the Porter-Cologne Act to implement and enforce the NPS Program Plan. The NPS Policy requires all nonpoint source discharges to be regulated under WDRs, waivers of WDRs, a Basin Plan prohibition, or some combination of these administrative tools. The NPS Policy also describes the key elements that must be included in a nonpoint source implementation program: "[b]efore approving or endorsing a specific NPS pollution control implementation program, a RWQCB must determine that there is a high likelihood the implementation program will attain the RWQCB's stated water quality objectives." To ensure that there will be a "high likelihood" that a program will achieve water quality objectives, the NPS Policy requires that a NPS program contain the following five "key elements":

- An NPS control program must, at a minimum, address NPS pollution in a manner that achieves and maintains water quality objectives and beneficial uses.
- An NPS control implementation program shall include a description of the management practices that will ensure attainment of the implementation program's stated purpose(s), the process to be used to select or develop management practices, and the process to be used to ensure and verify proper management practice implementation.
- When a time schedule is necessary, the program shall include quantifiable milestones designed to measure progress toward reaching the specified requirements.

- An NPS control implementation program shall include feedback mechanisms so that the Regional Board, dischargers, and the public can determine whether the program is achieving its stated purpose(s).
- Each Regional Board shall lay out the consequences for when the program fails to achieve its stated purposes. These "consequences" are non-binding courses of action that would be triggered if the program fails (i.e., the Regional Board would impose prohibitions, revise WDRs, etc.).

To the extent that the Salt and Nitrate Control Program established by the amendments is considered a "NPS Program," it meets the requirements of the NPS Policy. With respect to key element 1, Goal 2 of the Salt and Nitrate Control Program requires the Central Valley Water Board to work towards achieving balanced salt and nitrate loading in issuing permits to regulate salt and nitrates, including to all NPS permittees. Goal 3 of the Salt and Nitrate Control Program will require all permittees, including NPS permittees, to implement long-term, managed restoration of impaired water bodies, where reasonable, feasible and practicable. Key elements 2 and 3 of the NPS Policy will be satisfied when the Board issues permits to NPS permittees, since the Board must make determinations as to whether or not a permittee's treatment or control management practices will reasonably be expected to ensure attainment of the Salt and Nitrate Control Program's stated purposes on a timeline that is as short as practicable at the time the permits are issued. However, the Salt and Nitrate Control Program does include important milestones for both the Salt Control Program and the Nitrate Control Program. Key element 4 is satisfied through the SAMP, which is discussed elsewhere in this Staff Report. Lastly, key element 4 is satisfied in that the Board has spelled out the consequences that would occur if the Salt and Nitrate Control Program fails to achieve its stated purpose: the Board would revert to permitting discharges of salinity and nitrates under its traditional permitting approach, with all of the adverse effects that would be associated with that approach (see the discussion of the No Action alternative in Section 4.0 of the Staff Report for a more thorough discussion).

6.2.10 Water Quality Enforcement Policy

- Resolution 2002-0040
- Resolution 2009-0083
- Resolution 2017-0020

The State Water Board adopted this policy in 2002 and updated the policy in 2009 and 2017. This policy ensures that enforcement actions are consistent, predictable, and fair. The policy describes tools that the State and Regional Water Boards may use to determine the following: type of enforcement order applicable, compliance with enforcement orders by applying methods consistently, and type of enforcement actions appropriate for each type of violation. The State and Regional Water Boards have authority to take a variety of enforcement actions under the Porter-Cologne Water Quality Control Act.

Any enforcement of the proposed Basin Plan Amendments or the permits adopted thereunder would occur in accordance with the Water Quality Enforcement Policy. The proposed amendments do not remove any authority of the Board to take enforcement actions. Therefore, these amendments are consistent with this policy.

6.2.11 Policy for Developing California's Clean Water Act Section 303(d) List (*Listing Policy*)

- Resolution 2004-0063
- Resolution 2015-0005

The *Listing Policy* was adopted in 2004 and updated in 2015. Pursuant to Water Code section 13191.3(a), this State policy for water quality control describes the process by which the State Water Board and the Regional Water Boards will comply with the listing requirements of CWA section 303(d). The *Listing Policy* establishes a standardized approach for developing California's section 303(d) list to achieve water quality standards and maintain beneficial uses in all of California's surface waters. The *Listing Policy* applies only to the listing process methodology used to comply with CWA section 303(d).

CWA section 303(d) requires states to identify waters that do not meet, or are not expected to meet by the next listing cycle, applicable water quality standards after the application of certain technology-based controls and schedule such waters for development of TMDLs (40 CFR §130.7(c) and (d).).

The policy requires that the listing of a water body needs to be re-evaluated if the water quality standard has been changed. The proposed Basin Plan Amendments clarify but do not substantively revise the water quality objectives related to Secondary MCLs. Future 303(d) list development will consider clarified Secondary MCL WQOs for MUN beneficial use assessments which incorporates Title 22 context for the adopted Tables 64449-A and 64449-B to provide clarity and consistency in application. Consistent with this policy, any improvements in water quality will need to be considered in determining if the waters will or will not meet the applicable water quality standards by the next listing cycle.

6.2.12 Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California

- Resolution 2000-015
- Resolution 2000-030
- Resolution 2005-0019

The Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (a.k.a. State Implementation Plan or SIP) applies to discharges of toxic pollutants into the inland surface waters, enclosed bays, and estuaries of California subject to regulation under the Porter-Cologne Water Quality Control Act and the Federal CWA. Regulation of priority toxic pollutants may occur through the issuance of NPDES permits. The goal of the SIP is to establish a statewide, standardized approach for permitting discharges of toxic pollutants to non-ocean surface waters.

The proposed Basin Plan Amendments primarily address salt and nitrate, which are not priority pollutants. The proposed Secondary MCL Policy does not change the SIP's approach for permitting discharges of toxic pollutants to non-ocean surface waters.

6.2.13 Water Quality Control Policy for Addressing Impaired Waters: Regulatory Structure and Options

- Resolution 2005-0050

The State Water Board's Impaired Waters Policy incorporates the following:

- CWA section 303(d) identification of waters that do not meet applicable water quality standards and prioritization for TMDL development;
- Water Code section 13191.3(a) requirements to prepare guidelines to be used by the Central Valley Water Boards in listing, delisting, developing, and implementing TMDLs pursuant to CWA Section 303(d) of 33 USC § 1313(d); and

- Water Code section 13191.3(b) requirements that State Water Board considers consensus recommendations adopted by the 2000 Public Advisory Group when preparing guidelines.

The Impaired Waters Policy includes the following statements:

A. If the water body is neither impaired nor threatened, the appropriate regulatory response is to delist the water body.

B. If the failure to attain standards is due to the fact that the applicable standards are not appropriate due to natural conditions, an appropriate regulatory response is to correct the standards.

C. The State Water Board and Regional Water Boards are responsible for the quality of all waters of the state, irrespective of the cause of the impairment. In addition, a TMDL must be calculated for impairments caused by certain EPA designated pollutants.

D. Whether or not a TMDL calculation is required as described above, impaired waters will be corrected (and implementation plans crafted) using existing regulatory tools.

D1. If the solution to an impairment will require multiple actions of the Regional Water Board that affect multiple persons, the solution must be implemented through a Basin Plan Amendment or other regulation.

D2. If the solution to an impairment can be implemented with a single vote of the Regional Water Board, it may be implemented by that vote.

D3. If a solution to an impairment is being implemented by a regulatory action of another state, regional, local, or federal agency, and the Regional Water Board finds that the solution will actually correct the impairment, the Regional Water Board may certify that the regulatory action will correct the impairment and if applicable, implement the assumptions of the TMDL, in lieu of adopting a redundant program.

D4. If a solution to an impairment is being implemented by a non-regulatory action of another entity, and the Regional Water Board finds that the solution will actually correct the impairment, the Regional Water Board may certify that the non-regulatory action will correct the impairment and if applicable, implement the assumptions of the TMDL, in lieu of adopting a redundant program."

The proposed Basin Plan Amendments do not affect the process to identify impaired water bodies or the need to address the impairment. However, the proposed Basin Plan Amendments do allow for a temporary variance from meeting water quality based effluent limitations and temporary exceptions from meeting water quality objectives. These tools may be used in programs that implement TMDLs. Therefore, the proposed Basin Plan Amendments are consistent with this policy.

6.2.14 Policy for Compliance Schedules in National Pollutant Discharge Elimination System Permits

- Resolution 2008-0025

The Policy authorizes the Central Valley Water Board to include a compliance schedule in a permit for an existing permittee to implement a new, revised, or newly interpreted water quality objective or criterion in a water quality standard that results in a permit limitation more stringent than the limitation previously imposed.

The proposed Basin Plan Amendments do not change the Central Valley Water Board's authority to include compliance schedules in NPDES permits. For surface water permittees subject to new or revised NPDES permit limitations, the Central Valley Water Board will determine reasonable potential in a manner that is consistent with 40 CFR § 122.44(d), and determine if a compliance schedule is appropriate based on current applicable laws and policies, including consideration of meeting the Salt and Nitrate Control Program goals. The proposed Basin Plan Amendments recognize that compliance schedules are not appropriate in all cases and establish policy and procedures for situations that are not subject to compliance schedules.

6.2.15 Onsite Wastewater Treatment Systems Policy (OWTS)

- Resolution 2012-0032

This Policy establishes a statewide, risk-based, tiered approach for the regulation and management of OWTS installations and replacements and sets the level of performance and protection expected from OWTS. In the Central Valley region, most counties have developed Local Area Management Plans (LAMPs), consistent with the OWTS Policy. Those plans subject OWTS within the counties to additional monitoring requirements required by county ordinances, which may trigger tougher standards if monitoring reveals that OWTS are causing or contributing to a condition of pollution or nuisance (including with respect to nitrates and/or salts in the discharges from OWTS). OWTS regulated under the LAMPs could become elements of Management Zone Implementation Plans or Offsets. Nothing in the Salt and Nitrate Control Program is inconsistent with the regulatory provision of the OWTS Policy. The Central Valley Water Board will consider compliance and consistency with the Salt and Nitrate Control Program as data collected by agencies implementing LAMPs are submitted to the Central Valley Water Board, and will consider adding conditions pertinent to the control of salts and nitrates in future LAMP approvals as appropriate.

6.2.16 Policy for Water Quality Control for Recycled Water

- Resolution 2009-0011
- Resolution 2013-0003

This Policy is intended to establish consistent and predictable requirements in order to increase the use of recycled water in California. One of the overarching goals of the Recycled Water Policy is to develop salt and nutrient management plans (for groundwater basins or subbasins) that are sustainable on a long-term basis and to provide California with clean, abundant, local water.

The objective of the Salt and Nitrate Control Program is to address salinity and nitrate concerns in a consistent and sustainable manner and are based in part on recommendations of CV-SALTS in their Central Valley Salt and Nitrate Management Plan (CV-SALTS, 2016). In order to address the requirements of the Recycled Water Policy, as well as legacy and ongoing salt and nitrate accumulation concerns, these amendments are based on achieving the following prioritized Central Valley Region management goals for salt and nitrate: 1) ensuring safe drinking water supplies, and; 2) achieving balanced salt and nitrate loadings; and, 3) implementing a managed aquifer restoration program. Portions of the proposed Salt and Nitrate Control Program provide increased flexibility for permittees to conserve and recycle water to meet program goals. Therefore, these amendments are consistent of this policy.

6.2.17 Human Right to Water as a Core Value and Directing its Implementation in Water Board Programs and Activities

- State Water Board Resolution. 2016-0010
- Central Valley Water Board Resolution R5-2016-0018

See Section 3.7.2 for an evaluation of the proposed Basin Plan Amendments' consistency with Water Code section 106.3 and the Resolutions adopted to direct State and Central Valley Water Board staff to implement Water Code section 106.3.

6.3 CONSISTENCY WITH CENTRAL VALLEY REGIONAL WATER QUALITY BOARD POLICIES

The following are the Central Valley Water Board policies:

- Urban Runoff Policy
- Controllable Factors Policy
- Water Quality Limited Segment Policy
- Antidegradation Implementation Policy
- Application of Water Quality Objectives Policy
- Watershed Policy
- Drinking Water Policy

6.3.1 Urban Runoff Policy

On page IV-14.00 of the Basin Plan, the Central Valley Water Board's Urban Runoff Policy states:

"a. Subregional municipal and industrial plans are required to assess the impact of urban runoff on receiving water quality and consider abatement measures if a problem exist.

b. Effluent limitations for storm water runoff are to be included in NPDES permits where it results in water quality problems."

The proposed Basin Plan Amendments do not change the need to assess the water quality impacts of urban runoff or to address identified water quality impacts. Urban stormwater runoff is not considered to be a significant source of salinity or nitrates. However, the proposed Basin Plan Amendments provide a procedure to allow a variance from meeting water quality based salinity effluent limitations in NPDES permits should urban runoff be found to contribute to salinity impairments. The proposed Basin Plan Amendments are consistent with this Policy.

6.3.2 Controllable Factors Policy

On page IV-15.00 of the Basin Plan, the Controllable Factors Policy says,

> "Controllable water quality factors are not allowed to cause further degradation of water quality in instances where other factors have already resulted in water quality objectives being exceeded. Controllable water quality factors are those actions, conditions, or circumstances resulting from human activities that may influence the quality of the waters of the State, that are subject to the authority of the State Water Board or Regional Water Board, and that may be reasonably controlled."

The Controllable Factors is applicable when non-human sources of pollution or natural background conditions interfere with beneficial uses. Where water quality pollution is caused by

human factors subject to the authority of the Board and where those activities may be reasonably controlled through the issuance of permits, the Controllable Factors Policy does not apply. The proposed Basin Plan Amendments make reasonable allowances for naturally-occurring sources that may render beneficial uses unattainable, and would allow for the consideration of Basin Plan Amendments to revise those uses, where appropriate. The proposed Basin Plan Amendments are therefore consistent with the Controllable Factors Policy.

6.3.3 Water Quality Limited Segment Policy

On page IV-15.00 of the Basin Plan, the Central Valley Water Board's Water Quality Limited Segment Policy states:

> "Additional treatment beyond minimum federal requirements will be imposed on dischargers to Water Quality Limited Segments. Dischargers will be assigned or allocated a maximum allowable load of critical pollutants so that water quality objectives can be met in the segment."

The proposed Basin Plan Amendments allow the Central Valley Water Board to grant a variance from meeting water quality based effluent limitations if the permittee demonstrates that a variance is appropriate. Under the Salinity Variance Policy, the permit will include interim effluent limitations based on the current achievable effluent quality and development and implementation of a pollution prevention plan to reduce the effluent concentrations of the pollutant. Variances may be used when TMDLs to address water quality limited segments are under development to provide a permittee a short-term exception from meeting water quality based effluent limitations that may be inconsistent with final waste load allocations.

Similarly, for non-NPDES permittees, collaborative participation in the P&O Study during Phase I of the Salt Control Program allows a short-term exception from meeting water quality objectives and/or load allocations as long as the permittee maintains current best efforts to maintain or reduce salt in its discharge.

The proposed Basin Plan Amendments are consistent with this Policy.

6.3.4 Antidegradation Implementation Policy

Consistency of the proposed Basin Plan Amendments with the federal and state Antidegradation policies is discussed in Section 5.

6.3.5 Application of Water Quality Objectives Policy

Excerpts from Policy for Application of Water Quality Objectives are presented below. The full text can be found on page IV-16.00 of the Basin Plan.

> "Water quality objectives are defined as 'the limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water, or the prevention of nuisance within a specific area.' … Water quality objectives may be stated in either numerical or narrative form. Water quality objectives apply to all waters within a surface or ground water resource for which beneficial uses have been designated…"

> "The numerical and narrative water quality objectives define the least stringent standards that the Regional Water Boards will apply to regional waters in order to protect beneficial uses."

The Proposed Basin Plan Amendments clarify but do not substantively revise the water quality objectives related to Secondary MCLs. The Secondary MCL Policy proposes to incorporate text from Title 22 of the California Code of Regulations section 64449 and section 64449.2 into the Basin Plans that provides guidance on the application of "Recommended", "Upper", and "Short Term" consumer acceptance levels for TDS, EC, chloride, and sulfate in WDRs and NPDES permits. These modifications maintain the reasonable protection of designated MUN beneficial uses, so therefore these amendments are consistent with this policy.

6.3.6 Watershed Policy

On page IV-21.00 of the Sacramento River and San Joaquin River Basin Plan, the Central Valley Water Board's Watershed Policy states:

> "The Regional Water Board supports implementing a watershed based approach to addressing water quality problems. The State and Regional Water Boards are in the process of developing a proposal for integrating a watershed approach into the Board's programs. The benefits to implementing a watershed based program would include gaining participation of stakeholders and focusing efforts on the most important problems and those sources contributing most significantly to those problems."

The proposed Basin Plan Amendments were developed with the assistance of the CV-SALTS stakeholder initiative and are consistent with taking a watershed-based approach to addressing water quality issues and concerns. The Nitrate Control Program's Management Zone Permitting Approach and the Salt Control Program's Alternative Permitting Approach rely on stakeholder input, participation and collaboration to focus efforts on the most significant salt and nitrate problems in the Central Valley region and the sources contributing to those problems. Permittees will be expected to work towards achieving the water quality standards for the water body as a whole. As such, these amendments are consistent with this policy.

6.3.7 Drinking Water Policy for Surface Waters of the Delta and its Upstream Tributaries

This Policy includes a narrative water quality objective for *Cryptosporidium* and *Giardia*, along with implementation provisions to maintain existing conditions for public water systems. Applicable provisions from this Policy include the requirements to upstream permittees when implementation actions for *Cryptosporidium* and *Giardia* are triggered by monitoring at a public water system. In addition, the Policy recommends that the Central Valley Water Board consider the necessity of including monitoring of organic carbon, salinity and nutrients when WDRs are renewed.

The proposed Basin Plan Amendments do not change the implementation of the Drinking Water Policy and include salinity and nitrate monitoring as part of the proposed Monitoring and Surveillance Program. Therefore, these amendments are consistent with this policy.

7 ENVIRONMENTAL ANALYSIS

7.1 ENVIRONMENTAL REVIEW

7.1.1 Background

The Central Valley Water Board, as a Lead Agency under CEQA (Pub. Res. Code, § 21000 et seq.), is responsible for evaluating all the potential environmental impacts that may occur due to changes made to the Basin Plans. The Secretary of Resources has determined that the Central Valley Water Board's basin planning process qualifies as a certified regulatory program pursuant to Public Resources Code section 21080.5 and California Code of Regulations, title 14, section 15251(g). This determination means that the Central Valley Water Board is exempt from the requirement to prepare an environmental impact report for basin planning activities. Instead, this Staff Report and the Environmental Checklist (Appendix K) satisfy the applicable CEQA requirements.

This section and the Environmental Checklist evaluate the proposed amendment to the Basin Plan discussed in this Staff Report. The proposed amendment would incorporate a Salt and Nitrate Control Program, along with additional supporting clarifications, policies and authorities, to the Basin Plans for the Sacramento River and San Joaquin River Basins and Tulare Lake Basin. The proposed amendments also include Monitoring and Surveillance programs to ensure that water bodies will be in compliance with all applicable WQOs.

7.1.2 CEQA Scoping Meeting and Comments

Pursuant to Public Resources Code section 21083.9, CEQA Scoping Meetings and Public Workshops were held to discuss and solicit comments and suggestions from the public regarding the development of the CV-SALTS SNMP and the incorporation of components of the SNMP into the Basin Plans as the Central Valley Salt and Nitrate Control Program. The CEQA Scoping Meetings and Public Workshops for the program were held on October 10, 2013, in Modesto, October 16, 2013, in Rancho Cordova, October 21, 2013, in Colusa, and October 28, 2013 in Fresno, California. At these meetings/workshops, Central Valley Water Board staff from the CV-SALTS Program gave presentations describing the regulatory background and need for the SNMP, project proposal, and potential alternatives. As the lead agency for the CEQA process, the Central Valley Water Board prepared and issued the Notification of the CEQA Scoping Meeting and Public Workshop to all interested parties and was designated as the entity to receive all public comments regarding the proposed SNMP scope and content. Comments were to be submitted by December 31, 2013. Documents associated with the CEQA Scoping Meeting, including the meeting Notification, presentations, and Information Document, can be downloaded from the Central Valley Water Board website: http://www.waterboards.ca.gov/centralvalley/water_issues/salinity/.

The following list summarizes the key requests made in the comments pertinent to the CEQA assessment. The commenters requested:

- Assessment of how implementation of the SNMP would impact compliance with Sacramento-San Joaquin Delta (Delta) salinity objectives and water supplies of water rights holders responsible for compliance with Delta salinity objectives.
- Assessment of direct, indirect, and cumulative effects on the agricultural

environment from implementation of the SNMP.

- Assessment of a reasonable range of alternatives for the SNMP.
- Assessment of environmental impacts that may result from social and economic impacts of the SNMP.
- Assessment of impacts on vulnerable communities and populations.

7.1.3 Setting/Baseline

The setting is the existing physical condition (or baseline) within the affected environment against which the environmental conditions with a proposed project are assessed for determining environmental impacts. The affected environment for the proposed Basin Plan Amendments is the Central Valley Water Board's jurisdictional area. The Basin Plan Amendments address both surface water bodies and groundwater in the Central Valley region. Thus, the environmental setting against which the proposed Basin Plan Amendments are assessed includes the following characteristics:

- Existing water body quality, hydrology and operations of surface water bodies and groundwater basins in the Central Valley (described in Section 2)
- Existing quality and quantity of discharges to surface water bodies and groundwater in the Central Valley (described in Section 2)
- Existing regulatory programs and policies applicable to the regulation of water quality in the Central Valley Region (described in Section 3).

Two major alternatives are provided for this environmental assessment, the Proposed Project and a No Project Alternative, which are described in Section 4. Assessment of the alternatives for the Proposed Project and the No Project Alternative are provided in Section 4.

7.1.4 Proposed Project Analysis

The proposed Basin Plan Amendments would incorporate a Salt and Nitrate Control program, along with additional supporting clarifications, policies and authorities, to the Basin Plans for the Sacramento River and San Joaquin Rivers Basins and the Tulare Lake Basin.

The analysis in this Staff Report and the Environmental Checklist (Appendix K) concludes that the proposed Basin Plan Amendments would have **no impact** on the following environmental resources:

- Mineral Resources
- Public Services

The analysis in this Staff Report and the Environmental Checklist concludes that the proposed Basin Plan Amendments would have **less-than-significant impacts** on the following environmental resources:

- Air Quality
- Biological Resources

- Cultural Resources
- Geology and Soils
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Land Use and Planning
- Noise
- Population and Housing
- Recreation
- Transportation/Traffic
- Utilities and Service Systems

The analysis in this Staff Report and the Environmental Checklist concludes that the proposed Basin Plan Amendments would have **potentially significant impacts** on the following environmental resources:

- Aesthetics
- Agricultural and Forestry Resources
- Hydrology and Water Quality

The Environmental Checklist (Appendix K**)** provides a detailed analysis of the direct and indirect potential environmental impacts of the Proposed Project for each of these resource categories.

7.1.5 Cumulative Impact Analysis

Cumulative impacts refer to one or more individual effects which, when taken together, are considerable or which compound or increase other environmental impacts. Cumulative impacts are the result of the incremental impact of a project when added to other closely related past, present, and reasonably foreseeable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.

Implementation of the Proposed Project is expected to indirectly result in the need for surface and groundwater dischargers to construct specific projects for salt and nitrate management to achieve compliance with WDRs or other provisions that may result from the Board's implementation of the Proposed Project. This assessment does not speculate on whether the Proposed Project would indirectly contribute considerably to a cumulative condition for these resources, because the location and scope of the future projects is unspecified or uncertain. (Cal. Code Regs., tit. 14, § 15145). However, decision makers should recognize that an Implementation Project may be located in a non-attainment area for air quality or where cumulative traffic conditions are forecasted to be impacted, for example, and may contribute considerably to an adverse cumulative condition for one or more resources.

The Environmental Checklist analysis concluded that the Proposed Project's cumulative impacts to water quality degradation would be "no impact," "less than significant," or "potentially significant," depending on the particular Salt and Nitrate Control Program strategy, policy, or guidance document considered. The constituents of concern to water quality degradation with the Proposed Project include salts (EC, TDS, chloride, sulfate and sodium), nitrate, and additional parameters with secondary MCLs (aluminum, color, copper, iron, manganese, silver, turbidity, and zinc). Thus, this cumulative assessment is focused on cumulative water quality conditions for these constituents of concern in surface waters and groundwaters within the Central Valley Region.

7.1.5.1 Cumulative Surface Water Quality Conditions

Past and present projects or actions affecting surface water bodies within the Central Valley Region have resulted in the existing water quality conditions for these water bodies. Aside from the Proposed Project, reasonably foreseeable future actions that could affect surface water quality for the constituents of concern to this assessment in the Central Valley Region include the Lower San Joaquin River salt and boron TMDL, ILRP, storm water management programs, continued implementation of the NPDES program, CVP and SWP operations in compliance with regulatory requirements, and California Water Action Plan. The salt and boron TMDL, ILRP, and storm water management programs are all aimed at making improvements to water quality in the Central Valley Region. The California Water Plan lays out actions to improve water management in the state and CVP and SWP operations in compliance with regulatory requirements including compliance with Bay-Delta Water Quality Control Plan objectives for the salinity parameters EC and chloride.

7.1.5.1.1 Salinity Parameters

Salinity (as measured by EC and/or TDS) conditions within surface waters of the Central Valley Region are variable, with some areas of the region having concentrations of these constituents that adversely affect the ability to use the water for AGR and/or MUN purposes. Portions of the Sacramento, San Joaquin River and Delta hydrologic regions have water bodies on the state's CWA section 303(d) list of impaired water bodies due to salinity, EC, and/or TDS relative to the protection of AGR and MUN beneficial uses. In the future, the concentrations of salts in surface waters of the Central Valley Region are not expected to be substantially worse and, in fact, are expected to remain at similar levels or improve somewhat, relative to existing conditions, due to implementation of the Central Valley Salt and Nitrate Control Program and other Central Valley Water Board actions.

A component of the Salt and Nitrate Control Program is the Salinity Variance Policy, which proposes to amend the existing Salinity Variance Program to allow the authorization of variances up to 15 years following the effective date of the Basin Plan amendments that revise the program, and extend application of variances to salinity parameters for protection of the MUN and AGR beneficial uses. During this period, municipal wastewater dischargers could be granted variances from meeting WQBELs for salinity constituents, provided that the situations that these dischargers face are comparable to the case studies evaluated for the current Salinity Variance Program. An additional condition for obtaining the variance is that the discharger would participate in the Salinity Management Strategy Prioritization and Optimization Study. Modeling of the effects of granting variances to specific municipal wastewater discharges concluded that the effects on ambient salinity levels both near the point of discharge and at downstream locations would be imperceptible (Central Valley Water Board, 2014). Further, these variances would be limited to the period during which the Salinity Management Strategy is

implemented. Consequently, implementation of the Proposed Project would not have a considerable contribution to any adverse cumulative condition with respect to salinity parameters in surface waters.

7.1.5.1.2 Nitrate

Within surface waters of the Sacramento River, Tulare Lake, and Delta hydrologic regions, concentrations generally fall below the primary drinking water MCL of 10 mg/L-N (see Section 2.1, Environmental Setting). No beneficial uses, other than the MUN beneficial use, have numeric objectives or MCLs established for nitrate. Nitrate concentrations are variable across the San Joaquin River Hydrologic Region. Median concentrations in tributaries and the San Joaquin River are below 10 mg/L-N. Mud Slough and Salt Slough have historical concentrations above the 10 mg/L-N (Section 2.1, Environmental Setting); however, MUN is not a designated beneficial use of these water bodies. Within primary tributaries that are direct source waters for drinking water supplies (e.g., Merced River, Cosumnes River, Tuolumne River, Stanislaus River, San Joaquin River), nitrate concentrations are below 10 mg/L-N based on recent historical concentrations (Larry Walker Associates, 2016b).

Implementation of the Central Valley Salt and Nitrate Control Program, as well as continued implementation of other regulatory programs, including NPDES program and ILRP, are expected to continue to prevent any nitrate impairments in surface waters. Consequently, implementation of the Proposed Project would not have a considerable contribution to any adverse cumulative condition with respect to nitrate in surface waters.

7.1.5.1.3 Additional Secondary MCL Parameters

The Proposed Project will clarify how the Board will interpret compliance with Secondary MCL parameters for aluminum, copper, iron, manganese, silver, zinc, color, and turbidity. There are no CWA section 303(d) listings for these constituents due to impairment of the MUN beneficial use, with the exception of two ephemeral creeks in the foothills above Sacramento for aluminum, iron, and manganese. Total concentrations of aluminum, iron, and manganese have been frequently measured above the respective secondary MCL levels. Elevated levels of these metals are associated with particulates (i.e., suspended sediments) in surface waters and the dissolved concentrations for these constituents are typically less than the secondary MCLs and levels of these parameters are not identified as being of concern in watershed sanitary surveys (Larry Walker Associates, 2016b)). Color is a parameter typically not evaluated on surface drinking water sources, thus, data to characterize surface water conditions in the Central Valley Region is not available for this assessment; however, color is generally not recognized as a parameter of concern. All surface water bodies within the Central Valley Region have variable turbidity and high turbidity in surface waters does not preclude their use as a drinking water supply.

The secondary MCL revisions, to be implemented as part of the Salt and Nitrate Control Program, would clarify how secondary MCL-related water quality objectives for aluminum, copper, iron, manganese, silver, zinc, color and turbidity would be implemented in WDRs for surface water discharges. This clarification is more restrictive than existing Board practice. As discussed for the secondary MCL revisions in Appendix K Section IX, for copper, silver, and zinc, there are more stringent aquatic life criteria that apply to surface waters, therefore, the limitations in WDRs for these metals would be unaffected by the secondary MCL revisions. Also, as discussed in Appendix K, Section IX, turbidity and color water quality objectives would be unchanged by the secondary MCL revisions, thus, implementation of the Secondary MCL

revisions is not expected to result in substantial cumulative increases in turbidity or color relative to existing conditions. Aluminum, iron, and manganese are associated with particulates, and because interpretation provisions related to objectives to control of particulates (e.g., turbidity and suspended sediment objectives) would be unchanged, the secondary MCL revisions are not expected to result in substantial cumulative increases in these metals concentrations in surface waters as they relate to agricultural and storm water discharges (see Appendix K, Section IX). Similarly, increases in aluminum, iron, and manganese concentrations in surface water as related to municipal wastewater discharges are not expected to result in substantial cumulative increases in these metals, because the discharge quality is a function of the treatment processes in place, which will continue to be utilized into the future unaffected by this process. Therefore, future aluminum, copper, iron, manganese, silver, zinc, color, and turbidity conditions within Central Valley surface waters are expected to remain at similar levels to those that occur under existing conditions. Consequently, implementation of the Proposed Project would not have a considerable contribution to any adverse cumulative conditions with respect to aluminum, copper, iron, manganese, silver, zinc, color, or turbidity conditions.

7.1.5.2 Cumulative Groundwater Quality Conditions

7.1.5.2.1 Salinity Parameters

Salinity (as measured by EC and/or TDS) conditions within groundwaters of the Central Valley Region are variable, with some areas of the region having concentrations of these constituents that adversely affect the ability to use the water for AGR and/or MUN purposes (see Section 2.1, Environmental Setting). Hence, existing conditions for salts in groundwaters are considered to be sub-optimal in some basins or sub-basins.

In the long-term future, the concentrations of salts in the groundwaters of the Central Valley Region are expected to be at similar levels or be improved, relative to existing conditions, largely due to implementation of the Central Valley Salt and Nitrate Control Program. Through implementation of the Salt and Nitrate Control Program, dischargers in the Central Valley Region will have implemented treatment and control measures and projects to reduce loading of salts to groundwaters. There may be localized areas within the region where salts may still be above levels necessary for protection of AGR and MUN uses and stabilized at levels similar to those under existing conditions or at future levels. Finally, there may be localized areas within the region where groundwater salt degradation continues to occur into the future, and remediation back to existing conditions is not feasible. This may occur, for example, where an offset project has been used to address degradation. However, on a basin/sub-basin volume-weighted average basis, which is the proposed management structure for controlling and restoring salt, groundwater quality is expected to improve. Consequently, implementation of the Proposed Project is not expected to have a considerable contribution to any adverse cumulative conditions with respect to salt conditions at the basin or sub-basin level. Because the Proposed Project would allow localized areas of groundwater basins/sub-basins that are near or over the applicable water quality objective to be further degraded in the future, and because it will not be feasible to remediate all such localized areas of groundwater back to existing conditions or conditions better than existing conditions, the Proposed Project would contribute to adverse conditions of salts in some areas. This is considered to be a potentially significant cumulative impact. This impact is considered potentially significant and unavoidable.

7.1.5.2.2 Nitrate

Nitrate conditions within groundwaters of the Central Valley Region are variable, with some areas of the region having concentrations of these constituents that adversely affect the ability to use the water for MUN purposes (see Section 2.1, Environmental Setting). Hence, existing conditions for nitrate in groundwaters are considered to be sub-optimal in some basins or sub-basins.

The concentrations of nitrate in the groundwaters of the Central Valley Region are expected to be at similar levels or be improved, relative to existing conditions, due to implementation of the Central Valley Salt and Nitrate Control Program. Through implementation of the Salt and Nitrate Control Program, dischargers in the Central Valley Region will be required to implement treatment and control measures to reduce nitrate loading to groundwaters. However, even at full implementation, there may be localized areas within the region where nitrate may still be above levels necessary for protection of the MUN beneficial use. Finally, there may be localized areas within the region where groundwater nitrate degradation continues to occur. This may occur, for example, where an offset project has been used to address degradation. However, on a basin/sub-basin volume-weighted average basis, which is the proposed management structure for controlling and restoring nitrate, an improvement in nitrate concentrations in groundwater is expected. Consequently, implementation of the Proposed Project is not expected to have a considerable contribution to any adverse cumulative conditions with respect to nitrate. Because the Proposed Project would allow localized areas of groundwater basins/sub-basins that are near or over the applicable water quality objective to be further degraded in the future, the Proposed Project would contribute considerably to adverse conditions of nitrate in some localized areas. This is considered to be a potentially significant cumulative impact. This impact is considered potentially significant and unavoidable.

7.1.5.2.3 Additional Secondary MCL Parameters

Groundwater is generally not considered to be impacted with respect to the additional secondary MCL parameters addressed by the Proposed Project – aluminum, copper, iron, manganese, silver, zinc, color, and turbidity. While there are localized areas where concentrations of some of these parameters have been measured above secondary MCLs, on a region-wide basis, the quality relative to these parameters, which address consumer acceptance (i.e., non-health) concerns, is considered generally suitable for MUN and AGR uses (California Department of Water Resources, 2003). The trace metals of concern relative to secondary MCLs are natural elements and their presence in groundwater is largely a function of the hydrogeological conditions of the aquifers in the region. Similarly, turbidity in groundwater is caused by natural factors and typically less than 1 NTU (State Water Board, 2004). Color of groundwater is affected by the presence of other constituents that have MCLs that may be present. The natural hydrogeological processes that are occurring under existing conditions that contribute to the existing levels of trace metals, color and turbidity also would occur for the future as well. Therefore, conditions for these parameters within the groundwaters of the Central Valley Region are expected to be similar to existing conditions. Consequently, implementation of the Proposed Project would not have a considerable contribution to any adverse cumulative groundwater conditions with respect to the secondary MCL parameters of aluminum, copper, iron, manganese, silver, zinc, color, and turbidity.

7.1.6 No Action Alternative Analysis

This analysis of the No Project Alternative addresses whether the No Project Alternative would: 1) lessen or eliminate any of the potentially significant impacts identified for the Proposed

Project, 2) cause new or more severe potentially significant impacts compared to those identified for the Proposed Project, and 3) achieve the goals of the Proposed Project.

Under the No Project Alternative, there would be no adoption of the proposed Salt and Nitrate Control Program and associated permitting strategies, policies, and guidance documents. Thus, WDRs for agriculture, wastewater, and storm water dischargers in the Central Valley region would be based on existing water quality objectives, beneficial use designations, and programs of implementation, consistent with existing State Water Board and Central Valley Water Board plans and policies.

For agriculture, actions to achieve compliance with WDRs based on the existing regulatory framework could mean implementation of additional BMPs, such as irrigation water management and tailwater recovery systems, or a construction of drainage water collection, treatment, and disposal systems. However, it is unlikely that the implementation of additional BMPs by agriculture under the current approach could achieve compliance with existing regulations for salts and nitrate. Where discharges to surface water or groundwater cause exceedance of water quality objectives, dischargers would be required to address those exceedances within a ten-year time schedule that is established in current WDRs. If the water quality objective exceedances could not be addressed by the end of the time schedule, then those permittees could potentially be required to cease discharging. Degradation of groundwater salt and nitrate levels that is occurring under existing conditions would continue to occur in some areas of the Central Valley Region for a period of time before necessary actions to stop degradation could be implemented. The ultimate result of such actions, if feasible, would be water quality similar to existing conditions in some areas and somewhat more degraded in other areas, because restoration back to existing conditions is not anticipated to occur in all areas. However, a requirement for many agricultural dischargers to cease discharging entirely (i.e., cease irrigating crops, cease all growing activities) would be expected create widespread economic devastation in broad areas of the Central Valley, and the economic resources available to mitigate results of any historical practices would be lost.

For wastewater discharges to surface waters and groundwater, implementation of the No Project Alternative would mean the implementation of new treatment processes to remove constituents that have the potential to exceed water quality objectives for salinity constituents, nitrate, or certain metals. The result of such actions would be water quality at least equivalent to, if not improved, relative to existing conditions. However, the treatment technology to achieve these regulatory endpoints is beyond the financial capabilities of many communities in the Central Valley, and the rigid imposition of the No Project Alternative could leave such communities without a viable means of disposing their wastewater.

Storm water discharges that cause exceedance of water quality objectives in the receiving water would be required to address exceedances through modification and implementation of the permittee's storm water management program. No substantial degradation of water quality would be expected to occur, relative to existing conditions, because BMPs contribute to reduction in pollutant loadings and current BMPs are expected to be implemented into the future.

Based on considerations discussed above for agriculture, wastewater, and storm water dischargers, implementation of the No Project Alternative could somewhat lessen the potentially significant impacts identified for the Proposed Project for salt and nitrate levels in areas of groundwater basins/sub-basins where levels are currently approaching or exceeding applicable objectives and discharges would cause further degradation in the future. However, because

further degradation of such groundwater areas also would occur over a multi-year period into the future before corrective actions would be implemented under the No Project Alternative, this would be considered a **potentially significant impact**. As such, the No Project Alternative may somewhat lesson the potentially significant salt and nitrate water quality degradation impacts identified for the Proposed Project, but is not expected to reduce these impacts to a less-than-significant level.

In addition, implementation of the No Project Alternative would not result in the ultimate improvements in groundwater quality that are anticipated to occur with full implementation of the Salt and Nitrate Control Program. As such, the No Project Alternative would not achieve the three goals identified for the Proposed Project.

For the No Project Alternative, potential resulting actions of having to cease agricultural discharges could result in a **potentially significant impact** on agricultural resources, such as the conversion of farmland to a non-agricultural use (e.g., land fallowing). The loss of agriculture could, in turn, result in the displacement of people that support the agricultural industry (those working directly on farms and those that work for businesses that provide agricultural products and services), which would result in the need for housing elsewhere. This would be a **potentially significant impact** to population and housing. Further, there would be significant economic impacts from conversion of agriculture to non-agriculture use, as described in the SNMP Economic Analysis (Larry Walker Associates, 2016a).

The wastewater treatment plant upgrade projects that would be required for wastewater dischargers to achieve compliance with salt, nitrate, and secondary MCL-based objectives under the No Project Alternative would undergo project-specific CEQA evaluations. Environmental impacts that could occur during wastewater facility improvement projects include temporary impacts to air quality, noise, water quality, biological resources, traffic, and cultural resources associated with construction activities, though these can generally be mitigated to less-than-significant levels. Significant long-term impacts to environmental resources would generally not be expected because these projects typically involve reduction in pollutant loadings, and the new construction is typically within the existing site footprint. There may be increases in impervious areas, but because these areas would be small relative to the watersheds as a whole, this would not be expected to reduce groundwater recharge or adversely increase storm water runoff amounts or quality. Finally, modifications to wastewater facilities to achieve compliance with WDRs may notably increase power use at such facilities, relative to existing power usage, depending on the type and magnitude of treatment modifications required.

Finally, additional BMP actions that may be required for storm water discharges are not themselves expected to result in any new or more severe environmental impacts compared to those identified for the Proposed Project. Any BMP actions that would be implemented by storm water permittees that have the potential for environmental impacts would undergo separate, project-specific CEQA analyses prior to implementation.

7.1.6.1 Cumulative Impacts Assessment of the No Project Alternative

Like the Proposed Project, the No Project Alternative could indirectly cause impacts at the local level to air quality, greenhouse gas emissions, noise, transportation, and utilities and service systems from construction and operation of projects/facilities necessary to achieve current regulatory requirements. Because such projects are not adequately defined for environmental review at the time this assessment was prepared, and because separate project-specific

environmental review will be performed prior to project construction and operation, no cumulative impact determination is made here. Nevertheless, decisions makers should recognize the potential for indirect, cumulative effects to air quality, greenhouse gas emissions, noise, transportation, and utilities and service systems from implementation of the No Project Alternative exists, just as it does for the Proposed Project. These impacts will be further addressed, and cumulative impact determinations made, in separate project-specific environmental reviews prior to constructing the projects/facilities necessary to achieve current regulations under the No Project Alternative. Consequently, the concerns with regard to cumulative impacts to air quality, greenhouse gas emissions, noise, transportation, and utilities and service systems under the Proposed Project also would be of concern under the No Project Alternative; however, the specific projects that would be the drivers of such effects would differ between the Proposed Project and the No Project Alternative.

Under the No Project Alternative, costly projects to collect agricultural drainage for centralized treatment and disposal or other actions would be needed to comply with current regulations. Some farmers would not be able to afford such projects/actions on their farms and thus may be forced to stop farming and possibly sell their property. For farmers that are able to participate in these projects/actions, there might still be a need to fallow land in support of the projects. If such efforts were not made to comply with existing regulations, and the Central Valley Water Board did not allow agriculture to use surface water bodies to drain salts from agricultural soils to the extent that may be needed (due to impacts to surface water quality), the salt levels in agricultural soils in the San Joaquin Valley and possibly elsewhere would eventually increase to a point where agriculture lands could no longer support current crop production, or even alternative crop production. The selling or fallowing of farmlands in an effort to comply with existing water quality regulations under the No Project Alternative and/or increasing soil salt levels over time would contribute considerably to a **potentially significant cumulative impact to agriculture**. This is a new potentially significant cumulative impact that would not occur under the Proposed Project.

The remainder of this assessment focuses on cumulative impacts to water quality from implementing the No Project Alternative. This cumulative assessment is focused on cumulative water quality conditions for the same constituents of concern in surface waters and groundwaters within the Central Valley Region that were assessed for the Proposed Project.

7.1.6.2 Cumulative Surface Water Quality Conditions under the No Project Alternative

Under future conditions for the No Project Alternative, the concentrations of salts, nitrate, and secondary MCL parameters (i.e., aluminum, copper, iron, manganese, silver, zinc, color, and turbidity) in surface waters of the Central Valley Region are expected to be at similar levels, relative to existing conditions, due to implementation of Central Valley Water Board TMDLs for impaired water bodies and other actions driven by current regulations. Under this alternative, the Salt and Nitrate Control Program would not be implemented. In the future, dischargers in the Central Valley Region would have implemented treatment and control measures and projects to reduce loading of salts, nitrate, and secondary MCL parameters to surface waters, as needed, to achieve compliance with current regulations. Consequently, implementation of the No Project Alternative would not have a considerable contribution to any adverse cumulative condition with respect to salinity, nitrate, or secondary MCL parameters in surface waters.

7.1.6.3 Cumulative Groundwater Quality Conditions under the No Project Alternative

7.1.6.3.1 Salinity Parameters and Nitrate

Groundwaters are currently considered to be impacted for salts and nitrate in some areas of certain basins or sub-basins. In the future, under the No Project Alternative, the concentrations of salts and nitrate in the groundwaters of the Central Valley Region are expected to be similar or possibly improved, relative to existing conditions, due to implementation of treatment and control measures and projects to reduce loading of salts and nitrate to groundwaters, as needed, to achieve compliance with current regulations. However, because the No Project Alternative would allow localized areas of groundwater basins/sub-basins that are near or over the applicable water quality objective to be further degraded in the future until corrective actions are taken, and because it will not be feasible to remediate all such localized areas of groundwater back to existing conditions or conditions better than existing conditions, the No Project Alternative (like the Proposed Project) would contribute considerably to adverse future cumulative conditions of salts and nitrate in some localized areas of basins/sub-basins within the Central Valley Region. This is considered to be **potentially significant**. Because it is expected that some areas will remain degraded, on a localized basis, relative to existing conditions, this impact would be potentially significant and unavoidable. Consequently, implementation of the No Project Alternative would not eliminate this potentially significant impact identified for the Proposed Project for salts and nitrate in groundwater.

7.1.6.3.2 Additional Secondary MCL Parameters

Groundwater conditions for the additional secondary MCL parameters – aluminum, copper, iron, manganese, silver, zinc, color, and turbidity – are considered to not be impacted in the Central Valley Region under existing conditions. Future cumulative conditions under the No Project Alternative for these parameters within the groundwaters of the Central Valley Region are expected to be similar to existing conditions. Consequently, implementation of the No Project Alternative would not have a considerable contribution to any adverse cumulative groundwater conditions with respect to the secondary MCL parameters of aluminum, copper, iron, manganese, silver, zinc, color, and turbidity. The No Project Alternative would not be expected to result in any new impacts with regard to these parameters that were not identified for the Proposed Project.

7.1.7 Statement of Overriding Considerations

The Basin Plan Amendments have been developed to establish a regulatory framework to achieve long-term improvements in ambient water quality conditions in surface waters and groundwater in the Central Valley. However, achieving the goals will not be immediate; water quality degradation will occur while long-term management practices are being developed and implemented. Therefore, the environmental resources that may be significantly impacted as an indirect result of Implementation Projects undertaken to implement the proposed Basin Plan Amendments include:

- Aesthetics
- Agricultural and Forestry Resources
- Hydrology and Water Quality

California's Central Valley is one of the most productive agricultural regions in the world and is home to almost 20% of California's population (estimated at over 38 million in 2015). By 2030, the state population is expected to increase by more than 13% to over 44 million people and by 2050 the population is expected to be close to 50 million people. Elevated salt and nitrate concentrations in portions of the Central Valley impair or threaten to impair the region's water and soil quality which, in turn, adversely affects agricultural productivity and/or drinking water supplies. An economic study completed in 2009, projected that if salt management did not change, direct economic costs would exceed $1.5-billion/year within the Central Valley by 2030 (Howitt et al. 2009).

The proposed Basin Plan Amendments were developed in cooperation with the Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) initiative and form the core of a regulatory program designed to effectuate an environmentally and economically sustainable Salt and Nitrate Management Plan (SNMP) for the entirety of the Central Valley Water Board's jurisdiction. The proposed Basin Plan Amendments build on a range of water quality management policies and mechanisms already in existence and propose additional policies and tools needed to provide the Central Valley Water Board with flexibility in addressing legacy and ongoing loading of salt and nitrate in the diverse region. In order to comprehensively address legacy and ongoing salt and nitrate accumulation concerns, the proposed Basin Plan Amendments aim to achieve the following goals:

Goal 1: Ensure a safe drinking water supply.

Goal 2: Achieve balanced salt and nitrate loadings, where reasonable, feasible and practicable.

Goal 3: Implement managed aquifer restoration program, where reasonable, feasible, and practicable.

These management goals recognize the need to focus limited resources first on health risks associated with unsafe drinking water. Subsequent, but important, goals that will require longer implementation timelines include balancing salt and nitrate loading and restoring water quality, where reasonable and feasible.

The Central Valley Water Board finds the substantial and significant benefits of adopting the proposed Basin Plan Amendments outweigh the unavoidable potentially significant adverse environmental impacts to that could occur as a result of the adoption of the proposed Basin Plan Amendments.

8 ECONOMIC ANALYSIS

8.1 ECONOMIC ANALYSES FOR TOTAL PROJECT COSTS

This section provides an overview of the economics analysis conducted on the preferred and no project alternatives as part of the Central Valley-wide Salt and Nitrate Management Plan (SNMP) prepared under the CV-SALTS initiative (CV-SALTS, 2016) as well as an estimated cost to agriculture for the proposed Salt and Nitrate Control Program. Section 8.1 is an excerpt from Section 6.6 of the CV-SALTS SNMP (CV-SALTS, 2016), with the complete economic analysis provided in Attachment C-2 of the CV-SALTS SNMP (Larry Walker Associates, 2016a). Section 8.2 discusses potential costs to agriculture for the first 10-years of the proposed Salt and Nitrate Control Program.

8.1.1 Introduction

The CV-SALTS SNMP recommended the adoption of new policies, strategies, and guidance to address legacy and ongoing loading of salt and nitrate to the receiving waters in the Central Valley. To varying degrees, these new policies, strategies, and guidance require a suite of actions to be taken by various parties, including the Central Valley Water Board and the regulated entities that currently discharge salt and nitrate to Central Valley receiving waters, as well as those that propose to discharge in the future. The Central Valley SNMP recommends a comprehensive regulatory and programmatic approach for the sustainable management of salt and nitrate; this approach sets the stage for a host of future compliance strategies and associated projects to be implemented by individuals, as well as groups of individuals operating together in newly defined management zones. Given the future unknown nature of such individual and group actions, the ability to precisely define these actions and therefore, estimate the economic costs of such individual and group actions is challenging.

In the absence of details regarding specific salt and nitrate management actions that will take place in the future, the economics analysis offers planning level cost estimates for short- and long-term actions to address nitrate contamination of groundwater and long-term actions to address salinity management.

The Central Valley Water Board must consider four legal requirements related to economics when adopting a Basin Plan Amendment:

Water Code section 13141 - requires that prior to implementation of any agricultural water quality control program, the Central Valley Water Board must include an estimated cost of such a program, together with an identification of potential sources of funding, in the Basin Plans.

Water Code section 13241(d) - requires that the Central Valley Water Board consider economics when establishing water quality objectives.

Water Code section 13242 - requires the Central Valley Water Board to develop a program of implementation for achieving water quality objectives which includes (a) a description of the nature of actions which are necessary to achieve the objectives, including recommendations for appropriate action by any entity, public or private; (b) a time schedule for the actions to be taken; and (c) a description of surveillance to be undertaken to determine compliance with objectives.

Public Resources Code section 21159 - requires the Central Valley Water Board, when adopting an amendment that will require the installation of pollution control equipment or is a performance standard or treatment requirement, to include an environmental analysis of the reasonably foreseeable methods of compliance. This environmental analysis is required to take into account a reasonable range of environmental, economic, and technical factors, population and geographic areas, and specific sites.

The following sections provide a summary of the planning level cost estimates associated with the No Project Alternative and the Preferred Alternative. These have been developed with consideration of various cost estimates already developed under earlier CV-SALTS efforts.

8.1.2 Analysis of the No Project Alternative

8.1.2.1 Economic Impacts to Dischargers

Municipal and industrial wastewater dischargers that currently have an interim effluent limitation for EC, TDS, chloride, sulfate, and/or sodium based on a variance issued under the Salinity Variance Program or exception issued under the Salinity Exception Program would not be able to have that variance/exception renewed after June 30, 2019, via the program. The Central Valley Water Board can still grant new variances applicable to surface water discharges for EC, TDS, chloride, sulfate, and/or sodium before June 30, 2019, subject to USEPA approval. Once existing variances and exceptions expire, dischargers will be faced with meeting water quality objectives for salts that likely will require the implementation of additional treatment or control of their discharges, or other actions (e.g., new source water supply) that result in reduced loads for salinity. The current inclusion of performance-based effluent limitations in existing NPDES permits or WDRs tied to participation in CV-SALTS that are higher than AGR or MUN-based water quality objectives would no longer be allowed. In the absence of the Central Valley SNMP, these NPDES permits and WDRs would be amended to include final water-quality based effluent limitations.

Municipal and industrial wastewater discharges to groundwater would also be required to comply with EC and nitrate limitations based on applying EC and nitrate water quality objectives at the first encountered groundwater. The future compliance costs for these dischargers cannot be quantified because these costs will be case-specific and information supporting such an analysis has not been developed by CV-SALTS and is not otherwise available.

Discharges from irrigated agriculture to surface waters and groundwater would need to come into compliance with water quality objectives for EC, TDS, and nitrate in receiving water within 10 years from the triggering of a surface water or groundwater quality management plan for these constituents. Further, discharges to groundwater would be required to comply with EC and nitrate limitations based on applying EC and nitrate water quality objectives at the first encountered groundwater. Irrigated agriculture would have 10 years to reduce its loads of salt and nitrate to the point that discharges were compliant with water quality objectives for these parameters. Because existing WDRs and Conditional Waivers for irrigated agriculture have been written to describe CV-SALTS as providing future guidance on how and to what degree salt and nitrate loads will be controlled by agriculture, growers in the Central Valley have focused their attention on preventing the discharge of pesticides to surface waters. Salt and nitrate management for agricultural discharges are in the initial stages of development. The future compliance costs for these dischargers cannot be quantified because these costs will be case-specific and information supporting such an analysis has not been developed by CV-SALTS and is not otherwise available. It is unknown if future compliance costs will drive

growers to fallow or retire land as a means to balance the cost of compliance with maintaining viable agricultural operations.

Discharges from dairies that are determined to cause or contribute to an exceedance of a water quality objective, unreasonably affect beneficial uses, or cause a condition of pollution or nuisance require the discharger to bring its discharge in compliance with groundwater limitations no later than 10 years after the submittal date of a summary representative monitoring report, which must be submitted by July 1, 2020. Dairies are required to implement management practices/activities (BPTC for high quality waters or best efforts for waters that are not high quality) that will bring the facilities into compliance on a time schedule that is as short as practicable. Also, dairies would need to comply with EC and nitrate limits based on water quality objectives in first encountered groundwater. Similar to irrigated agriculture, existing WDRs for dairies have been written to include language that CV-SALTS will provide future guidance on how and to what degree salt and nitrate loads will be controlled. Without the regulatory flexibility afforded by the SNMP's policies, strategies, and guidance, dairies will be faced with meeting water quality objectives for salts that likely will require the implementation of additional treatment or control of their discharges. The future compliance costs for these dischargers are difficult to quantify because these costs will be case-specific and information supporting such an analysis has not been developed by CV-SALTS and is not otherwise available. However, a 2013 cost estimate for retrofitting existing and constructing new lagoons for select dairy sizes ranged from $180,000 (New single liner lagoon construction for a 300 cow dairy) to $1,400,000 (Retrofitting of existing lagoon with double liner for a 3,000 cow dairy per lagoon) (Provost & Pritchard Consulting Group, 2013). Where the expected compliance costs cannot be feasibly met, these dairy operators will likely have to cease operations, impacting local economies.

Stormwater dischargers would continue to be required to implement stormwater management plans and BMPs, as necessary, to achieve compliance with water quality objectives. Stormwater is not a large contributor of nitrate, but does observe seasonally high EC/TDS concentrations during storm runoff events. Increased costs to this discharge sector could occur as a result of being required to implement additional BMPs (e.g., education and outreach) to reduce TDS. Although future cost increases to stormwater programs would not be expected to be significant.

8.1.2.2 Projected Future Economic Impacts of Not Controlling Salinity

Howitt et al. (2009) released a report describing future economic impacts to 2030 that could occur in the Central Valley if salinity discharges to groundwater continue at their current pace in the absence of new regulation aimed to control the groundwater degradation caused by salts. The study assumed no changes to current policies or programs as of 2009 and, as such, represents the economic impacts associated with the No Project Alternative.

Projected increases in salinity in the Central Valley were based on two factors:

Growth of the areas of shallow saline groundwater based on 30 years of historical records; and

Increased levels of salts that result indirectly from imported water.

Based on increasing salinity from these factors, the research team measured the direct economic effects on industry, residential, food processing, confined animal operations, and irrigated agricultural production. The study assumed that economic and social impacts will

occur in the Central Valley as salinity levels increase, creating changes in water quality, water supply, production of goods and services, income, and employment. A major component of the study was to determine the direct (initial changes) and indirect (inter-business commerce) effects of increasing salinity on water demand and usage in various economic sectors in the Sacramento, San Joaquin, and Tulare basins, including municipal and industrial water treatment, food processing, confined animal feeding operations, and agriculture.

Direct impacts are usually measured as direct physical costs on water users including industry, urban users and agriculture. Examples of direct impacts from increased salinity include:

Changes to water taste for consumers and degradation of water appliances

Accelerated degradation of pipes and other water infrastructure.

Additional treatment costs for animal feeding operations and food processing facilities

Reduced crop yields for agriculture

The economic impacts of not implementing a salinity management program, similar to the Central Valley SNMP, were empirically estimated by assuming that salinity continues to accumulate at its current rate (in mg/L per year of TDS): 2.63 mg/L/year for the San Joaquin and Tulare basins, and a range of 0 – 1.53 mg/L per year for the Sacramento Basin. The analysis looked at three salinity accumulation scenarios: baseline, medium, and high. The 2.63 mg/L per year rate was used for the Tulare and San Joaquin basin in all three scenarios, while the rate was varied for the Sacramento Basin: 0 mg/L per year (baseline), 0.64 mg/L per year (medium), and 1.53 mg/L per year (high) (Howitt, et al., 2009).

Based on three salinity accumulation scenarios (baseline, medium and high) within hydrologic regions, the study projected economic activity and social conditions to 2030 using the Regional Economic Modeling, Inc. (REMI) model. The model estimated direct economic effects (loss of production in various sectors) and indirect effects (loss of income, output, employment, and population):

Direct Economic Effect –Across all three basins, the total direct loss ranged from $988 million to $1.543 billion for the year 2030, depending on the salinity scenario. The San Joaquin Basin was estimated to experience the greatest impacts for most sectors except for concentrated animal feeding operations and irrigated agriculture, whereas the Tulare Basin was estimated to experience the largest economic impacts.

Indirect Economic Effect – Effects were estimated for various scenarios and areas. Under the medium salinity accumulation scenario assumptions, annual California income was expected to decline by $2.251 billion, output by $6.485 billion, employment by 46,299, and population by 65,013 in the year 2030. Under the baseline salinity assumptions, impact estimates were reduced by approximately 25 percent and under the high assumptions, increased by approximately 35 percent.

Howitt et al. (2009) acknowledged that a detailed understanding of salinity levels, distribution, and rates of accumulation in the Central Valley was lacking at the time the modeling was conducted and therefore, the results of the study should not be used to develop regional policies for the control of salt. The researchers noted that the principal uncertainties associated with the results were caused by a lack of information on the physical parameters of

salinity accumulation rather than the economic parameters and future efforts should be targeted on improving the hydrological knowledge of salinity accumulation.

8.1.3 Analysis of the Preferred Alternative

The Preferred Alternative includes a number of recommendations for which planning level cost estimates may be derived, e.g., supply of replacement drinking water to affected communities, long-term actions to address salt and nitrate contamination of groundwater, and numerous studies and investigations required under the proposed policies and strategies. Proposed policies, strategies, and guidance collectively identify various discharge-specific studies, and in some cases monitoring and surveillance efforts, that would be needed as a means to characterize current impacts of a discharge on the receiving water, establish current ambient water quality, and monitor future ambient water quality resulting from the implementation of control measures. For other aspects of the Preferred Alternative, cost estimates are not possible because future actions or projects to control salt and nitrate are too speculative, e.g., future actions will be dependent upon the concentrations of these pollutants in the discharges and the available assimilative capacity of the receiving water or groundwater basin to which these discharges occur.

Using available information derived from existing analyses and cost estimates completed for other CV-SALTS studies, the economic analysis further developed planning level cost estimates. These cost estimates focused on short-term drinking water solutions, long-term drinking water solutions, long-term nitrate management, and long-term salinity management that support the three SNMP management goals (see Section 6 of Attachment C-2 in the CV-SALTS SNMP) (Larry Walker Associates, 2016a). Short-term is defined as the period prior to implementation of long-term salt or nitrate management actions (typically within 20 years). Long-term is defined as a greater than 20-year time period. Cost estimates based on site-specific conceptual projects are scaled to the regional level, where possible.

8.1.3.1 Drinking Water

The economics evaluation considered both short and long-term solutions for ensuring a safe supply of drinking water in areas with groundwater impacted by nitrate (see Section 6.3.2 and 6.3.3 in Attachment C-2 of the SNMP (Larry Walker Associates, 2016a) for additional details).

8.1.3.1.1 Short-term Drinking Water Solution

For areas where groundwater well nitrate concentrations are elevated, a short-term drinking water solution is to provide bottled water to individuals and households. This analysis considered areas where nitrate was either ≥ 7.5 mg/L (as N) or ≥ 10 mg/L (as N). The analysis was conducted first for the Alta Irrigation District (AID) area (Kings Subbasin; DWR B118 Code: 5-22.08) and then extrapolated to the Central Valley area. The following assumptions were used to calculate the annual cost to provide bottled water to individuals and households:

Drinking water consumption per household is 2.25 gallons per day (gpd).

Drinking water cost is $1.63 per gallon.

Cities with populations greater than 5,000 were assumed to currently provide their residents with drinking water in community systems that met the primary MCL for nitrate of 10 mg/L (as N) and therefore, were excluded from the analysis.

The estimated annual cost to provide bottled water to the AID area ranged from $3.9 million to $6.6 million where nitrate was ≥ 10 mg/L (as N) and ≥ 7.5 mg/L (as N), respectively. When

extrapolated to the Central Valley, the annual costs ranged from $80 million to $117 million, respectively.

8.1.3.1.2 Long-term Drinking Water Solution – Community Water Systems

Connecting households impacted by nitrate levels in groundwater to either existing community water systems or new community systems is a viable solution for providing drinking water that meets drinking water standards to affected households. Consistent with the CV-SALTS Nitrogen Implementation Measures Study (NIMS) Report (CDM Smith, 2016a), the economic analysis relied on the pump, treat and serve (PTS) model of a community water system to develop an approximate cost basis for the AID area and then extrapolated those findings to nitrate-impacted areas in the Central Valley. CDM Smith (2016a) developed costs for three different treatment processes to significantly reduce nitrate concentrations (1 mg/L as N or lower) in groundwater before providing as finished drinking water to consumers. The three nitrate removal processes evaluated by NIMS were reverse osmosis, ion-exchange, and biological denitrification.

For the AID area the economics analysis assumes two water treatment plants would be needed to provide treated groundwater to the smaller communities[109] in the District. Table 8-1 summarizes the estimated PTS costs for the three different types of treatment technologies.

[109] Cutler, Delft Colony, Dinuba, East Orosi, London, Monson, Orosi, Seville, Sultana, Traver, and Yettem.

Table 8 - 1. Community Water System Estimated Costs for the AID Area Using Different Treatment Technologies for Nitrate Removal (Adapted from CDM Smith 2016a)

Treatment Technologies for Nitrate Removal	Capital Costs (Millions)	Operations and Maintenance (Millions/Year)	Annualized Cost (Millions)[1]
Reverse Osmosis	$71.25	$6.92	$9.42
Ion Exchange	$47.28	$3.35	$6.08
Biological Denitrification	$42.97	$1.32	$3.80
Notes:[1] Annualized costs were based on annual operations and maintenance (O&M) costs plus annualized capital costs at a 4% annual interest rate			

8.1.3.1.3 Long-term Drinking Water Solution – Point of Use (POU) Treatment

Areas of dispersed population with elevated nitrate concentrations in groundwater that will not be serviced by a community water system will require installation of a POU treatment system in each household. POU treatment systems for nitrate consist of whole house nitrate ion exchange (IX) systems, whole house reverse osmosis (RO) systems, and under-the-sink (UTS) RO systems. For the economic analysis, UTS RO systems were assumed to be the most practical device for servicing nitrate-impacted households, given the drawbacks of the other two systems: (a) Whole house RO systems are cost prohibitive and would require in many households extensive plumbing modifications to ensure that the treated water does not leach metals from existing plumbing; and (b) Nitrate IX systems treat all of the household's water, but they do so by adding salt, which can cause taste issues in the drinking water as well as add salt load to the household's wastewater.

The cost basis for UTS RO systems assumes that they are leased (at a monthly rate) and will require RO membrane replacement every three to five years. Costs were developed for the AID area and then extrapolated to the Central Valley.

The number of households in the AID area that would not be connected to the community water system was estimated using GIS and census data (2010) and available nitrate data. Table 8-2 provides the estimated annual costs for leasing UTS RO systems within areas with different nitrate conditions

Table 8 - 2. Point-of-Use Treatment System Estimated Costs for the AID Area

Point-of-Use Treatment Area in AID	Population[1]	Number of Households[1]	Monthly Unit Cost[2]	Total Annual Cost[3]
Upper or Lower Zone - Nitrate ≥ 10 mg/L as N	6,483	1,752	$40	$0.9 million
Upper or Lower Zone Nitrate - ≥ 7.5 mg/L as N	12,103	3,162	$40	$1.6 million
Notes: [1] U.S. Census Bureau 2010 [2] Based on conservative quote for monthly lease of an RO system [3] Total Annual Cost includes the cost of membrane replacement for POU treatment system every 3 years				

8.1.3.2 Long-term Nitrate Management

The SNMP management goals applicable to the long term management of nitrate include:

- Ensuring a safe drinking water supply for all residents in the valley;
- Balancing salt and nitrate loading to eliminate further degradation where reasonable and feasible; and
- Implementing management restoration where reasonable and feasible

The first goal, ensure a safe drinking water supply, has been evaluated above in Section 8.1.3.1. For the purposes of developing cost estimates for management measures intended to address the second and third goals, the following general approach was followed:

- Cost estimates for aggressive restoration actions were developed for two subareas within the AID area (Dinuba and Cutler-Orosi) (Luhdorff & Scalmanini and Larry Walker Associates, 2016b).
- Local information for the Cutler-Orosi and Dinuba subareas was used to estimate costs for the entire AID study area; and
- AID area costs were extrapolated to estimate costs to meet the long-term nitrate management goals in the Central Valley in areas impacted by elevated nitrate levels in groundwater.

The sections below summarize cost estimates for the AID area and the Central Valley. SNMP Attachment C-2 (Larry Walker Associates, 2016a), Luhdorff & Scalmanini Consulting Engineers and Larry Walker Associates (Luhdorff & Scalmanini and Larry Walker Associates, 2016b) and CDM Smith (CDM Smith, 2016a) provide additional information regarding the costs developed for the Cutler-Orosi and Dinuba subareas.

8.1.3.2.1 Long Term Nitrate Management in the Alta Irrigation District

In order to change the ambient nitrate concentration in groundwater in the AID study area, aggressive measures were modeled. Removing nitrate mass is accomplished by pumping groundwater out of the aquifer system. That water can either be treated and served, treated and reinjected, or applied directly to agricultural lands. An additional aggressive measure to reduce nitrate concentrations in the groundwater basin is through artificial winter season recharge on agricultural fields (on-farm winter recharge), e.g., application of excess Kings River water during winter months (November through March) to areas where the potential for accepting recharge is high. These two concepts (pumping and recharge) were considered in the development of this cost estimate.

To develop a cost estimate for the entire AID area, which was then used to provide a Central Valley-wide cost estimate, two AID subareas, Dinuba and Cutler-Orosi, were prioritized for pump, treat, and reinject based on their status as economically disadvantaged communities, ambient nitrate levels, land uses, and mass loadings. A third area located north of Dinuba and east of Reedley was selected to evaluate the on-farm winter recharge scenario based on its high recharge potential (soil type, depth to water, etc.). Four different management scenarios (Plans A through D) were modeled for several different well pumping rates and based on assumed well field engineering designs, modeling was completed for each of the two subareas to estimate water quality benefits achieved under each scenario. This information was then extrapolated to the larger AID area (see Attachment C-2 of the SNMP for detailed information regarding the modeled management scenarios, well-field engineering designs, and development of costs for the Dinuba and Cutler-Orosi areas).

Using the costs developed for the two AID subareas costs were estimated for the entire AID area (see Attachment C-2 of the SNMP for subarea cost information). As before, it was assumed that regional treatment facilities with ion exchange technologies and evaporation ponds would be used to reduce nitrate prior to reinjection. The standard capacity of a treatment facility was assumed to be 25 MGD. Based on data for the AID area, it was estimated that seven treatment facilities of this size would be needed to handle extracted water from the upper zone, and eleven treatment facilities would be needed to meet the treatment needs for the lower zone. Evaporation ponds would be needed for residuals; it is estimated that an evaporation pond area of approximately 3.5 acres (assuming 5-ft depth) would be needed for each 25 MGD treatment facility. Based on these assumptions, Table 8-3 provides the estimated costs for long-term nitrate management in the AID area under Restoration Plan B. Plan C and D costs would be incrementally higher (see Attachment C-2 for information regarding characteristics of Plans B, C and D).

Table 8 - 3. Estimated Capital and O&M Costs for Long-Term Nitrate Management in Entire AID Area Based on Restoration Plan B

Aquifer Zones	Capital Costs ($ Millions)					Annual O&M Costs ($ Millions)				
	Wells	Treatment		Total		Wells	Treatment		Total	
		Low	High	Low	High		Low	High	Low	High
Upper	$867	$202	$427	$1,069	$1,294	$87	$25	$57	$112	$143
Lower	$1,373	$318	$670	$1,691	$2,043	$137	$39	$89	$176	$227
Project Total	$2,240	$520	$1,097	$2,760	$3,377	$224	$64	$146	$288	$370
Contingency (30%)				$828	$1,001				$86	$111
Total, with contingency				$3,588	$4,338				$374	$481
Annualized capital cost (20 yrs., 3% interest)				$241	$292					
Total annual cost (annualized capital & O&M)				Low	High					
				$615	$773					

8.1.3.2.2 Long-Term Nitrate Management in the Central Valley

The cost estimates for the AID area were scaled up to the Central Valley based on the AID modeling findings and the area of nitrate-impacted areas in the Central Valley. However, as noted by Luhdorff & Scalmanini Consulting Engineers and Larry Walker Associates (2016b) this approach has to be strongly qualified. Applying pump, treat, and reinject designs to large regional areas may not be practicable. Instead, localized management efforts in areas of high priority (based on proximity to communities and existing ambient conditions) may be a more feasible approach to achieving restoration. With that caveat, to obtain a planning-level understanding of the potential costs of a valley-wide restoration effort, the economic analysis estimated the required number of wells and treatment facilities needed for the Central Valley area and the total volumes to be treated daily. The planning level estimate assumed that areas with existing nitrate concentrations above 7.5 mg/L nitrate (as N) would be aggressively restored (note that this is an extrapolation and has not been modeled; it is unknown how long it would take to reach target concentration goals or whether they are attainable at all). Table 8-4 summarizes the area requiring treatment and required numbers of extraction/ injection wells for both the AID area and Central Valley.

To estimate costs, it was again assumed that regional treatment facilities with ion exchange technologies and evaporation ponds would be built for treating the pumped groundwater valley-wide. At a proposed 25 MGD capacity per facility and given estimated treatment volumes, 204 and 185 treatment facilities were projected for the upper and lower zones, respectively, under Plan B. Evaporation ponds of approximately 3.5 acres (assuming 5-ft depth) would be needed for each 25 MGD treatment facility. Table 8-5 provides the resulting estimated Central Valley costs in billions of dollars. These estimates are intended to only present a planning-level understanding of the financial effort involved in aggressively restoring such a large area. Because of all of the generalizations, estimations, and 'scaling up' factors involved, actual costs could easily be plus or minus 50% of estimated costs.

Table 8 - 4. Estimates of the Number of Wells and Area Requiring Treatment in the AID Area and Projections for the Central Valley

Area	Area Needing Treatment (square miles)	No. of Extraction Wells	No. of Injection Wells
Alta Irrigation District			
Upper Zone	208	238	381
Lower Zone	254	377	604
Total	462	615	985
Central Valley			
Upper Zone	6,154	7,053	11,291
Lower Zone	4,324	6,418	10,283
Total	10,478	13,471	21,574

Table 8 - 5. Estimated Capital and O&M Costs for Long-Term Nitrate Management in the Central Valley Based on Restoration Plan B

Aquifer Zones	Capital Costs ($ Billions)					Annual O&M Costs ($ Billions)				
	Wells	Treatment		Total		Wells	Treatment		Total	
		Low	High	Low	High		Low	High	Low	High
Upper	$26	$6	$12	$32	$38	$2.6	$0.7	$1.7	$3.3	$4.3
Lower	$23	$5	$11	$28	$34	$2.3	$0.7	$1.5	$3.0	$3.8
Project Total				$60	$72				$6.3	$8.1
Contingency (30%)				$18	$22				$1.9	$2.4
Total, with contingency				$78	$94				$8.2	$10.5
Annualized capital cost (20 yrs., 3% interest)				$5.2	$6.3					
Total annual cost (annualized capital & O&M)				Low	High					
				$13.4	$16.8					

8.1.3.3 Salt Management

The Central Valley SNMP proposes that the management of salt be addressed through the adoption and implementation of the Salinity Management Strategy (SNMP Attachment A-3). This three-phased strategy includes implementation of a Phase I Prioritization & Optimization Study for a period of about 10 years. This study, which is estimated to cost between $7 and $13 million, will identify recommended salt management projects for implementation by hydrologic region. Projects may range from those that would be implemented on a local or subregional basis to larger, regional projects such as a regulated brine line (CDM Smith 2016b). As part of the Prioritization & Optimization Study, costs for recommended local or subregional salt management projects will be developed. In addition, CDM Smith (2014) provides estimated planning level costs for various treatment technologies evaluated.

In addition, CV-SALTS developed costs for a regulated brine line (CDM Smith, 2014). Per this study, brine would be discharged via either the East Bay Municipal Utility District (EBMUD) outfall or an alternative outfall location in saline waters. The Bay Area disposal option potentially has the capacity to manage all of the current salt accumulation in the Central Valley. Table 8-6 provides the planning costs developed for this project in 2014 based on salt accumulation estimates in key IAZs (see SNMP Section 3.1) (CDM Smith, 2014).

Page Intentionally Left Blank

Table 8 - 6. Estimated Central Valley Regulated Brine Line Costs (Adapted from CDM Smith 2014)

Component	IAZs 9, 10, 14, 15, 19, 21, and 22				IAZ 6				Entire Project	
	Capital Cost			O&M Cost ($M)	Capital Cost			O&M Cost ($M)	Total Capital Cost ($B)	Total O&M Cost ($B)
	Number of Units	Unit Cost	Total ($M)		Number of Units	Unit Cost	Total ($M)			
Extraction wells	693	$1.4M	$970	$97	155	$1.4M	$217	$22		
Desalter facilities	33	$150M	$4,950	$495	7	$150M	$1,050	$105		
Post-RO brine treatment	37.25MGD	$4/gal	$149	$15						
Reinjection wells	624	$1.4M	$874	$87	16	$1.4M	$22	$2		
Brine line[1]	• 24” diam, 50mi • 36” diam, 22 mi • 48” diam, 63 mi • 2 x 48” diam, 90 mi • 2 x 48” diam, 56 mi	• $6/ LF diam in • $6/ LF diam in • $6/ LF diam in • $6/ LF diam in • $15/ LF diam in	$38 $25 $96 $239 $373							
Subtotal Brine Line			$771	$77						
Brine line pump stations	7	$36.85M	$258	$72						
Brine disposal at EBMUD	74.5MGD	$0.04/gal		$1,088						
Deep well brine disposal					35	$2.53M	$89	$9		
Total costs			$7,972	$1,938			$1,378	$138	$9.3	$2.1
Contingency (30%)									$2.8	$0.6
Total plus contingency									$12.1	$2.7
Estimated annual cost (over 30 years at 3% interest rate)									$0.6	$2.7
Total estimated annual cost									$3.3	
Notes: [1] A 1.75 multiplier (instead of 2) is applied for segments where two parallel pipes are used (to account for cost savings from using the same alignment).										

8.1.3.4 Economic Costs Attributable to Individual CV-SALTS Policies, Strategies, and Guidance

Different elements of the policies, strategies, and guidance recommended by the SNMP will require resources to implement. This will be true regardless of whether the work is performed by an individual discharger or by a group of dischargers within an approved management zone. In addition, the proposed SNMP does not specify the salt and nitrate control methods or projects that individual dischargers or groups of dischargers may implement in the future to meet water quality objectives and satisfy the requirements of the SNMP. As a consequence, dischargers may be required to complete studies or analyses to support the development of a management program. Given the expectation of these types of implementation costs, the economics analysis summarized the types of studies, plans, or analyses that may be required to support implementation of a particular policy, strategy or guidance. For example, for implementation of the Groundwater Management Zone Policy, the economics analysis includes estimated costs for development of the Preliminary Management Zone Proposal, Early Action Plan, Initial Assessment, Notice of Intent, Final Management Zone Proposal, and Management Zone Implementation Plan. See Section 6.3.6 in Attachment C-2 of the SNMP (Larry Walker Associates, 2016a) for more information.

8.1.3.5 SNMP Surveillance and Monitoring Program

The SAMP establishes a template for development of a groundwater surveillance and monitoring program to support implementation of the SNMP (see SNMP Section 5) (CV-SALTS, 2016). The monitoring program will be further developed while the Basin Plan amendment process is underway to incorporate the SNMP into the Basin Plans. The purpose of a surveillance and monitoring program is to provide the means for determining if the implementation program is achieving its goals to improve nitrate and salt conditions in groundwater. The program is intended to provide a means to periodically assess salt and nitrate to evaluate progress toward meeting those goals.

The surveillance and monitoring program domain is the Central Valley as a whole, but local monitoring programs associated with WDRs or the execution of Management Zone Implementation Plans established for newly defined management zones could be linked with the monitoring program. For example, local or management zone monitoring programs could serve the purposes of the SNMP surveillance and monitoring program within those local areas. The SAMP report identifies several tasks, both to start-up and implement the program (See SNMP Sections 5.4 and 5.5) (CV-SALTS, 2016). It is anticipated that a project budget between $3.0 and $5.5 million would be needed to fund the first 10 years of the monitoring program (includes start-up costs and reporting at 5 year intervals). With additional administration and contracting costs, estimated annual cost over the first 10-year period is between $300 and $550 thousand dollars (CDM Smith, 2016c). These costs are not necessarily new costs since to the extent practical, the surveillance and monitoring program will rely on existing monitoring programs.

8.2 Calculating Costs to Agriculture Under Proposed Salt and Nitrate Control Program

8.2.1 Overview

State law requires that basin plans indicate estimates of the total cost and identify potential sources of funding of any agricultural water quality control program prior to its implementation (Water Code Section 13141). The Central Valley Water Board intends on establishing a Central

Valley-wide Salt and Nitrate Control Program that has three main goals: 1) Ensure safe drinking water supplies; 2) Balance salt and nitrate loading; and 3) Restore impacted water bodies where reasonable feasible and practicable. While the overall program will be implemented in a phased approach to help distribute associated implementation costs, implementation of the program is anticipated to result in significant costs to dischargers. The following sections describe the methodology and rationale for this cost evaluation and present the estimated cost to agriculture for the first 10 years of the Salt and Nitrate Control Program. A summary of the overall program costs is also presented in Table 8-10. Additionally, a discussion regarding other entities that have a share of responsibility for costs associated with the Central Valley's salinity issues is included at the end.

Under the proposed phased Salt Control Program, the first 10 years represents the implementation of the Phase 1 - Priority and Optimization (P&O) Study, where the overall, long-term salinity management plan, it's governance and funding structure and the conceptual salinity management projects will be developed. Under the prioritized Nitrate Control Program, the time-period represents the first 10 years of implementation of the program within the Priority 1 and 2 groundwater basin/sub-basin areas and includes measures to supply safe drinking water on a short-term basis to nitrate impacted communities and domestic well users as well as develop the governance structure for Management Zones (collective discharger groups) and initiate the framework for long-term safe drinking water supplies. Central Valley floor area groundwater basins/sub-basins were prioritized for program implementation based on the average groundwater nitrate concentration within the Upper Zone of each basin/subbasin utilizing averaging of groundwater nitrate concentrations in 1 square mile grid cell sizes for each basin/sub-basin.

8.2.1.1 Excluded Costs

Goal 2 of the Program, balancing of salt and nitrate loading is being implemented under the Irrigated Lands Regulatory Program (ILRP) through ongoing source control requirements, therefore costs for continued source control activities are not included in this estimate. Cost identified with Goal 3, long-term groundwater restoration, is included within the Economic Analysis of the CV-SALTS - Salt and Nitrate Management Plan (SNMP) (CV-SALTS, 2016) and noted here as preliminary. The costs for the long-term restoration are conceptual and will be revised and incorporated into the overall program costs following completion of the P&O Study, since many of these salt and nitrate impacted areas overlap and restoration of both areas may be combined as part of the overall program. Phase 2 and 3 Salt Control Program costs are estimates for detailed design, permitting and implementation of future salt management projects. These costs would occur after the first 10-years of the proposed Salt Control Program.

8.2.1.2 Control Program Cost Estimation Methodology

Estimated costs associated with this program are based on conceptual projects and associated capital and operational costs described and contained in the following documents:

- Central Valley SNMP Economic Analysis (Larry Walker Associates, 2016a) – This document presents the results of the economic analysis of the SNMP and related policies;

- Strategic Salt Accumulation Land and Transportation Study (SSALTS) - Phase 3 Report – Evaluate Potential Salt Disposal Alternatives to Identify Acceptable Alternatives for Implementation (CDM Smith, 2016b) – This study identified the range of viable Central Valley alternatives for salt disposal to provide input for consideration during development of the SNMP for the region under the jurisdiction of the Central Valley Water Board. The findings were used to guide discussions regarding establishment of regional salt management policies and the need for changes to the existing Basin Plans to facilitate salt disposal in a manner that is most beneficial to the region and consistent with the Recycled Water Policy;

- Nitrate Implementation Measures Study (NIMS) (CDM Smith, 2016a) - NIMS describes and provides cost estimates for various management scenarios for reducing nitrate concentrations in groundwater and was used in the SNMP Economic Analysis (Larry Walker Associates, 2016a) to estimate cost to treat the groundwater under the Alta Irrigation Archetype study (See next bullet);

- CV-SALTS Management Zone Archetype Analysis: Alta Irrigation District (Luhdorff & Scalmanini and Larry Walker Associates, 2016b) – This study serves as an example and "proof of concept" to help test, on a spatially refined basis, the application of selected policies, data analysis methods, and salt and nitrate management approaches that were considered by CV-SALTS during SNMP development;

- Surveillance and Monitoring Program (SAMP) Final Report (CDM Smith, 2016c) - The SAMP Report is designed to help direct the monitoring requirements of the proposed Basin Plan Amendment and help support its adoption and approval; and

- Concept Level Tasks and Costs for the SAMP Implementation, Memorandum to CV-SALTS Executive Committee from Joe LeClaire (CDM Smith) and Richard Meyerhoff (CDM Smith). September 13, 2016 (CDM Smith, 2016c) – This memorandum provides cost estimates for implementation of the SAMP.

These studies identify implementation measures and associated costs for all phases of the Control Program.

The cost estimate for the Central Valley-wide Salt and Nitrate Control Program provided here accounts for the first 10-years of program administration (e.g., Board oversight and third-party activities), the first phase of the Salt Control Program throughout the Central Valley, the first ten years of the Nitrate Control Program throughout the Priority 1 and Priority 2 basins/sub-basins, and surveillance and monitoring program costs. All costs are expressed as 2016 dollars.

8.2.2 Salt Control Program

Estimated cost for the Salt Control Program is for the first 10-year phase of the three-phased program. This phase includes development and implementation of the P&O Study. As indicated previously, the P&O Study is designed to develop the overall salinity management plan, it's governance and funding structure and the conceptual design of the salinity management projects to be implemented. The P&O Study will become the main framework for the overall, long-term salinity management strategy for the Central Valley over the next 30 to 50 years or more. This cost estimate anticipates that the majority of agricultural dischargers will participating in the P&O Study. Estimated cost for the Salt Control Program for the first 10 years is

summarized in Table 8-7. The main P&O Study components along with the estimated cost for each component are also summarized below for the full 10-year period:

- Stakeholder Coordination - Stakeholder and Sustainable Groundwater Management Act (SGMA) Groundwater Sustainability Agency (GSA) Meetings ($0.53 to $1.06 million);
- Strategic Planning – Regulatory and Policy Evaluations and Phase II Planning ($1.04 to $2.80 million);
- Governance Structure Development – Governance Plan Formation and Structure Development, Implementation and Refinement ($0.42 to $1.06 million);
- Funding Development – Development and Implementation of Funding Plan and Finance Strategy ($0.63 to $1.06 million);
- Basin Prioritization and Salinity Management Analyses – Revisions to Groundwater Basin/Sub-basin Prioritization, Groundwater Modeling, Prioritization within Groundwater Basins/Sub-basins, Development of Salt Management Projects, Identification of Salt Storage Areas, Interim Truck or Rail Transportation of Brine Studies and Interim Phase I Report ($1.99 to $3.36 million);
- Conceptual Design of Salt Management Projects – Conceptual Design of Central Valley Subregional Salt Management Projects and Central Valley Regulated Brine Line Project ($1.06 to $1.83 million); and
- Special Studies – Groundwater Quality Characterization of Groundwater Basins/Sub-basins for Trace Constituents, Emerging Technology Reviews, Recycled Water Import Study and Stormwater Recharge Master Plan Development ($1.05 to $1.93 million).

Estimated costs for the Salt Control Program are presented in the CV-SALTS SNMP Economic Analysis (Larry Walker Associates, 2016a), which includes estimated Phase 2 and 3 costs for detailed design of salt management projects (in-valley salt disposal projects and the Central Valley Regulated Brine Line) and for permitting, construction and implementation of the capital projects. These Phase 2 and 3 costs are estimated to be approximately $3.3 billion per year over an approximate 30-year timeframe; however, as indicated earlier, these costs are conceptual and will be revised upon completion of the P&O Study.

8.2.2.1 Total Salt Control Program Estimated Costs - Phase 1

Total cost for the Salt Control Program for the first phase is estimated to range from approximately $6.7 million to $13 million or an average of $0.67 million to $1.3 million per year for 10 years and is based on the estimated costs to perform the Prioritization and Optimization Study (P&O Study) as presented in the SSALTS Phase 3 Report (CDM Smith, 2016b).

8.2.2.2 Agriculture Cost Share Methodology

The percentage share of the Salt Control Program costs attributable to agriculture is based on the percentage of irrigated agricultural land use within the Central Valley floor area versus total land area within the Central Valley floor area (7 million irrigated agricultural acres (NASA, 2015) versus 13.2 million total acres for the Central Valley floor area (California Department of Water Resources, 2003) = 53 %).

8.2.2.3 Salt Control Program Annual Costs to Agriculture

The estimated annual cost for agriculture to comply with the Salt Control Program ranges from $360,000 to $700,000 per year for the first phase of the control program (Table 8-7). The estimated cost for agriculture to comply with the Salt Control Program is a cumulative total that includes costs for the Sacramento River and San Joaquin River Basins, and the Tulare Lake Basin and represents a 53% agricultural share of the total Salt Control Program's Phase 1, P&O Study, annual cost range for the first 10 years of program implementation.

8.2.3 Nitrate Control Program

The first 10 years of implementation of the Nitrate Control Program will occur within the initially designated Priority 1 and 2 groundwater basin/sub-basin areas. Six (6) groundwater basins/sub-basins out of a total of 43 groundwater basins/sub-basins within the Central Valley floor area are considered Priority 1 Basins/Sub-basins. These six basins/sub-basins are located within the Southern San Joaquin Valley and cover approximately 20% of the overall Central Valley floor area (2.64 million acres out of a total of 13.2 million acres). Eight (8) additional groundwater basins/sub-basins within the Central Valley floor area are considered Priority 2 Basins/Sub-basins. These basins/sub-basins cover slightly over 38% of the Central Valley floor area (5.04 million acres out of 13.8 million acres total) and are predominantly located within the San Joaquin Valley, with exception of one, the Yolo sub-basin, located in the Sacramento Valley.

Total cost to comply with the Nitrate Control Program is based on anticipated regulation of nitrate by Management Zone, assuming agricultural coalitions will take the lead on Management Zone implementation. Ten agricultural coalitions cover the Priority 1 and 2 basin/sub-basin areas, so ten (10) Management Zone governance bodies were assumed for Management Zone formation costs. Estimated costs represent cost to Priority 1 Basin area dischargers during the first 10 years of program implementation and costs to Priority 2 Basin area dischargers for 8 years, as implementation of the program in Priority 2 areas occurs 2 years after Priority 1 Basin dischargers are required to implement the program.

Estimated costs include Management Zone formation costs and costs to supply safe drinking water on both a short and long-term basis to nitrate impacted communities and domestic well users. Short-term drinking water supply costs represent costs for supplying bottled water for a period of two years per Management Zone. Long-term supply costs include community water system treatment upgrades for impacted communities with water systems and point source treatment system installation and maintenance for impacted domestic well users. The CV-SALTS SNMP Economic Analysis (Larry Walker Associates, 2016b) estimated these short and long-term supply costs for the entire Central Valley floor area. To estimate costs applicable only to the Priority 1 and 2 Basins/Sub-basins, the Central Valley floor area costs were adjusted based on estimated nitrate loading. Based on the NIMS analysis (CV-SALTS, 2016c), the estimated percentage of nitrate loading (in tons) in the Central Valley floor area that occurs in the Priority 1 and Priority 2 Basins/Sub-basins is 65%.

8.2.3.1 Total Nitrate Control Program Estimated Costs – First 10 Years - Priority 1 and 2 Basin Areas

Total cost for the Nitrate Control Program for the first 10 years of program implementation is estimated to range from approximately $268 to $399 million or an average of $26.8 to $39.9 million per year and is based on implementation of Nitrate Control Program requirements to supply safe drinking water to impacted communities and domestic groundwater beneficial users

(on both a short-term and long-term basis) predominantly through Management Zones. Nitrate Control Program cost components for this estimate include:

- Management Zone Formation Costs for Priority 1 and 2 Basins/Sub-basins (10 Managements Zones total)

- Short-Term Drinking Water Supply - Bottled Water Supply for 2 Years for Management Zones in Priority 1 and 2 Basins/Sub-basins

Long-Term Drinking Water Supply – Point Source Treatment and Community Water System Upgrade Work for 8 Years for Management Zones in Priority 1 and 2 Basins/Sub-basins (Estimated cost for each component is presented in Table 8-8).

The Nitrate Control Program, similar to the Salt Control Program, includes requirements to implement long-term restoration of impacted water bodies (where reasonable, feasible and practicable) which will occur after the first 10-years of the proposed program. These costs have been identified in the CV-SALTS SNMP Economic Analysis (CV-SALTS, 2016a) to be approximately $13.4 to 16.8 billion per year over an approximate 20-year timeframe, but as indicated previously, these costs are conceptual and will be revised.

8.2.3.2 Agricultural Cost Share Methodology

A 2016 UC Davis study indicating that agricultural croplands and manure contribute 90% of the nitrate that impacts groundwater within California (Tomich, 2016). This percentage was used to estimate the cost to agriculture associated with compliance with the Nitrate Control Program for the first 10 years of implementation within the Priority 1 and 2 Basins/Sub-basins.

8.2.3.3 Nitrate Control Program Annual Costs to Agriculture – First 10 Years – Priority 1 and 2 Basin Areas

The estimated annual cost for agriculture to comply with the first 10 years of the Nitrate Control Program ranges from $24 to $36 million per year. This cost represents 90% of the cumulative total cost that includes costs to establish Management Zones in the Priority 1 and 2 areas and to provide short and long-term drinking water supplies within these same areas over the first 10 years of the program.

8.2.4 Surveillance and Monitoring Program

The overarching goals of the Salt and Nitrate Surveillance and Monitoring Program (SAMP) are to:

- Periodically assess the progress of the Salt and Nitrate Control Program and, if appropriate, support efforts to re-evaluate the requirements of the control program;

- Develop statistically representative ambient water quality determinations and trend analyses for Total Dissolved Solids (TDS)/Electrical Conductivity (EC) and Nitrate as Nitrogen; and

- Maximize the use of existing monitoring programs to provide needed data and avoid duplication of efforts.

The estimated Surveillance and Monitoring Program costs presented here are based on a program that will attain these goals, while minimizing overall program cost. It is anticipated that the majority of the salt and nitrate data will be collected under other efforts, therefore estimated costs represent average annual costs to:

- Develop a Surveillance and Monitoring Work Plan and Quality Assurance Project Plan;
- Compile existing water quality data;
- Collect monitoring data for data gap areas; and

Prepare summary reports presenting ambient water quality and trends for submittal to the Central Valley Water Board every five years (two (2) reports during the initial 10 years of program implementation).

8.2.4.1 Total Surveillance and Monitoring Program Estimated Costs – First 10 Years

Total estimated cost for the Surveillance and Monitoring Program for the entire Central Valley floor area ranges from $3.0 to $5.5 million over the first 10 years of the program or $300 to $550 thousand per year. Surveillance and Monitoring Program estimated costs used are from the "*Concept Level Tasks and Costs for the SAMP Implementation Memorandum to CV-SALTS Executive Committee*" (CDM Smith, 2016c) for total Central Valley floor area (13,182,630 acres).

8.2.4.2 Agriculture Cost Share Methodology

Annual cost share to agriculture represents the average between the nitrate program percentage of responsibility (90%) and the salt program percentage of responsibility (53%), which equates to an average 72%.

8.2.4.3 Surveillance and Monitoring Program Annual Costs to Agriculture – First 10 Years

The estimated cost for agriculture to comply with the Surveillance and Monitoring Program requirements ranges from $210 to $390 thousand per year for the first 10 years of program implementation (Table 8-9).

Table 8 - 7. Estimated Annual Costs for Agriculture to Comply with the Salt Control Program

SALT CONTROL PROGRAM		Estimated Total Cost ($ Millions)			Estimated Cost Per Year ($ Millions)			
Phase 1 - P & O Study (First 10 years)	Strategic Planning	1.04	to	2.8	Over 5 years	0.21	to	0.56
	Stakeholder Coordination Meetings	0.53	to	1.06	Over 10 Years	0.05	to	0.11
	Governance Structure Development	0.42	to	1.06	Over 10 Years	0.04	to	0.11
	Funding Development	0.63	to	1.06	Over 10 Years	0.06	to	0.11
	Basin Prioritization and Salinity Management Analyses	1.99	to	3.36	Over 5 Years	0.40	to	0.67
	Conceptual Design of Salt Management Projects	1.06	to	1.83	Over 4 Years	0.27	to	0.46
	Special Studies	1.05	to	1.93	Over 7 Years	0.15	to	0.28
	Salt Control Program Phase 1 Total Cost:	6.72	to	13.1	Over 10 Years	0.67	to	1.31
	Salt Control Program Cost to Agriculture:	**3.57**	**to**	**6.96**	**Over 10 Years**	**0.36**	**to**	**0.70**
	Based on 53.1% share of total Salt Control Program costs (The percentage of irrigated agricultural land to total land within the Central Valley floor area= 7,000,000 acres/13,182,630 acres = 53.1%)							
Phase 2 - Design and Permitting Conceptual Cost Estimate (Years 10 to 20)	**Phase 2 Total:**	**Not performed in the first 10 years**			**Included in Phase 3 Costs**			
Phase 3 - Construction and Operation Conceptual Cost Estimate (Years 20 to 40)	**Phase 3 Total:**	**Not performed in the first 10 years**				**3300**	**to**	**3300**

Table 8 - 8. Estimated Annual Costs for Agriculture to Comply with the Nitrate Control Program

NITRATE CONTROL PROGRAM		Estimated Total Cost ($ Millions)			Estimated Cost Per Year ($ Millions)			
First 10 Years for Priority 1&2 Basins	Management Zone (MZ) Formation Costs	4.80	to	12.5	n/a - one time cost			
	Short-Term Safe Drinking Water Supply Costs-Bottled Water	104	to	152	Over 2 Years	52.0	to	76.0
	Long-Term Safe Drinking Water Supply Costs (Priority 1 and Priority 2 Areas)	159	to	234	Over 8 Years	19.9	to	29.3
	Nitrate Control Program Priority 1&2 Total Cost:	268	to	399	Over 10 Years	26.8	to	39.9
	Nitrate Control Program Cost to Agriculture:	**241**	**to**	**359**	**Over 10 Years**	**24.1**	**to**	**35.9**
	Based on California Nitrogen Assessment (CNA) Report Percent of Nitrate in Groundwater Attributable to Ag = 90% of Program Cost							

Table 8 - 9. Estimated Annual Costs for Agriculture to Comply with the Surveillance and Monitoring Program

SURVEILLANCE AND MONITORING PROGRAM		Estimated Total Cost ($ Millions)			Estimated Cost Per Year ($ Millions)			
First 10 Years of Salt and Nitrate Control Program	*Estimated costs include cost for Surveillance and Monitoring Program Work Plan and Quality Assurance Project Plan development, compilation of existing water quality data, monitoring of data gap areas and preparation of summary reports for submittal to the Central Valley Water Board every 5 Years (2 reports in this estimate).*							
	Surveillance and Monitoring Costs for the first 10 years:	3.00	to	5.50	Over 10 Years	0.30	to	0.55
	Surveillance and Monitoring Cost to Agriculture:	**2.15**	**to**	**3.94**	**Over 10 Years**	**0.21**	**to**	**0.39**
	Based on an average of the percentage responsibility for Nitrate of 90% and the percentage of responsibility for salinity of 53.1% = 71.6%							

8.2.5 Overall Salt and Nitrate Control Program Estimated Costs

8.2.5.1 Total Overall Salt and Nitrate Control Program Estimated Cost

The total estimated cost for the Salt and Nitrate Control Program for the first 10 years ranges from $278 to $417 million or an average annual cost of $27.8 to $41.7 million per year.

8.2.5.2 Overall Salt and Nitrate Control Program Annual Cost to Agriculture – First 10 Years

The estimated annual capital and operational costs for agriculture to comply with the overall Salt and Nitrate Control Program for the first 10 years ranges from $24.7 to $37.0 million per year (See Table 8-10).

Table 8 - 10. Summary Totals and Costs to Agriculture

SUMMARY TOTALS	Estimated Total Cost ($ Millions)			Estimated Cost Per Year ($ Millions) over 10 years		
Salt Control Program Phase 1 Total Cost:	6.72	to	13.10	0.67	to	1.31
Salt Control Program Cost to Agriculture:	3.57	to	6.96	0.36	to	0.70
Nitrate Control Program Priority 1&2 Total Cost:	268	to	399	26.8	to	39.9
Nitrate Control Program Cost to Agriculture:	241	to	359	24.1	to	35.9
Surveillance and Monitoring Costs for the first 10 years:	3.00	to	5.50	0.30	to	0.55
Surveillance and Monitoring Cost to Agriculture:	2.15	to	3.94	0.21	to	0.39
Total Cost for First 10 Years of Salt and Nitrate Control Program:	**278**	to	**417**	**27.8**	to	**41.7**
Total Cost for First 10 Years of Salt and Nitrate Control Program to Agriculture:	**247**	to	**370**	**24.7**	to	**37.0**

8.2.6 Potential Funding Sources

Potential funding sources include:

1. Private financing by individual and/or group sources.
2. Bonded indebtedness or loans from governmental institutions.
3. Federal grants or low-interest loan programs.
4. Single-purpose appropriations from federal or State legislative bodies.
5. Grant and loan programs administered by the State Water Resources Control Board and Department of Water Resources, which are targeted for agricultural water quality improvement. These programs include:

a) Clean Water Act funds (State Water Resources Control Board)
b) Agricultural Water Quality Grant Program (State Water Resources Control Board)
c) Clean Water State Revolving Fund (State Water Resources Control Board) and
d) Integrated Regional Water Management grants (State Water Resources Control Board, Department of Water Resources)

8.2.6.1 Other Potential Funding Sources - Entities with Responsibility for Salt Loading or Loss of Assimilative Capacity of Groundwater Within the Central Valley

There are other entities, such as Central Valley Water Project and State Water Project Contractors, Water Districts and agencies responsible for water diversions that also share some responsibility for the salt issues in the Central Valley and therefore should share some of the program cost. These entities, through the importation of surface water to areas where the water cannot drain out of the basin system, such as the closed Tulare Lake Basin, cause groundwater salinity increases. Entities exporting high quality surface water out of the Central Valley, cause reductions in groundwater assimilative capacity by redirecting high quality (low salt concentration) surface water that would otherwise recharge groundwater basins. Due to the complexities of surface water import to and export from the Central Valley, calculation of a potential numerical percentage of responsibility for responsible entities is outside of the scope of this staff report. Further evaluation is recommended as part of the P&O Study during identification of potential funding sources.

8.2.7 Future Review and Evaluation of Costs

As noted throughout the Economic Analysis, developing a cost estimate for the long-term implementation of the Salt and Nitrate Control Program is difficult and estimated cost impacts to agriculture beyond the first 10 years is highly speculative. Accordingly, as the program is implemented over time, the Central Valley Water Board will update cost estimates during future Basin Plan Amendments concurrent with phased program reviews identified under the Salt Control Program.

9 REFERENCES

Archibald Consulting et al. (2012). *California State Water Project Watershed Sanitary Survey, 2011 Update.* Retrieved from http://www.water.ca.gov/waterquality/drinkingwater/docs/Printerscopycombin.pdf

Ayers, R., & Westcot, D. (1985). *Water Quality for Agriculture.* Rome: Food and Agriculture Organization.

Buena Vista Coalition. (2014). *Surface Water Monitoring Plan*. Retrieved from https://www.waterboards.ca.gov/centralvalley/water_issues/irrigated_lands/water_quality/coalitions/buena_vista/surface_water/buena_vista_swmp.pdf

California Bond Accountability. (2008). 2008 California Strategic Growth Plan. Retrieved from http://www.bondaccountability.ca.gov/Strategic_Growth_Plan/documents/CSGP_2008-0001.pdf

California Department of Water Resources. (2003). *California's Groundwater, Bulletin 118 Update 2003.* Retrieved from https://www.water.ca.gov/LegacyFiles/pubs/groundwater/bulletin_118/california's_groundwater__bulletin_118_-_update_2003_/bulletin118_entire.pdf

California Department of Water Resources. (2013a). *California Water Plan – Volume 2: Regional Reports, Sacramento River Hydrologic Region.* Retrieved from http://www.water.ca.gov/waterplan/cwpu2013/final/index.cfm

California Department of Water Resources. (2013b). *California Water Plan – Volume 2: Regional Reports, San Joaquin River Hydrologic Region.* Retrieved from http://www.water.ca.gov/waterplan/cwpu2013/final/index.cfm

California Department of Water Resources. (2013c). *California Water Plan – Volume 2: Regional Reports, Tulare Lake Hydrologic Region.* Retrieved from http://www.water.ca.gov/waterplan/cwpu2013/final/index.cfm

California Department of Water Resources. (2013d). *California Water Plan – Volume 3: Resource Management Strategies, Conveyance – Regional/Local. Update 2013. Chapter 6.* Retrieved from http://www.water.ca.gov/waterplan/cwpu2013/final/ind

California Department of Water Resources. (2018). *California Data Exchange Center. Water Supply Information*. Retrieved from http://cdec.water.ca.gov/water_supply.html

CDM Smith. (2013). *Strategic Salt Accumulation Land and Transportation Study (SSALTS) Final Phase 1 Report- Identification and Characterization of Existing Salt Accumulation Areas.* San Joaquin Valley Drainage Authority.

CDM Smith. (2014). *Strategic Salt Accumulation Land and Transportation Study (SSALTS) Final Phase 2 Report-Development of Potential Salt Management Strategies.* San Joaquin Valley Drainage Authority.

CDM Smith. (2016a). *Nitrate Implementation Measures Study (NIMS) Final Report.* San Joaquin Valley Drainage Authority.

CDM Smith. (2016b). *Strategic Salt Accumulation Land and Transportation Study (SSALTS) Phase 3 Report-Evaluate Potential Salt Disposal Alternatives to Identify Acceptable Alternatives for Implementation.* San Joaquin Valley Drainage Authority.

CDM Smith. (2016c). *Concept Level Tasks and Costs for the SAMP Implementation [Memorandum].* CDM Smith.

CDM Smith. (2016d, December). *Salinity Effects on MUN-related Uses.* Retrieved from White paper prepared for CV-SALTS: http://www.cvsalinity.org/index.php/docs/committee-document/technical-advisory-docs/water-quality-objective-reviews/3618-cvsalts-final-mun-tech-memo-120116/file.html

Central Valley Regional Water Quality Control Board (Central Valley Water Board). (2004). *Central Valley Water Board Final Staff Report--Amendments to the Water Quality*

Control Plan for the Sacramento River and San Joaquin River Basins for the Control of Salt and Boron Discharges into the Lower San Joaquin River.

Central Valley Water Board. (2006). *Salinity in the Central Valley: An Overview.* Sacramento.

Central Valley Water Board. (2010, August). *Draft Groundwater Quality Protection Strategy: A "Roadmap" for the Central Valley Region.* Retrieved from http://www.waterboards.ca.gov/rwqcb5/water_issues/groundwater_qua

Central Valley Water Board. (2014). Amendments to The Water Quality Control Plan for The Sacramento River and San Joaquin River Basins and The Water Quality Control Plan for The Tulare Lake Basin To Add Policies For Variances From Surface Water Quality Standards For Point Source Dischargers, Variance Program For Salinity, And Exception From Implementation Of Water Quality Objectives For Salinity. Resolution No. R5-2014.0074. Retrieved from Central Valley Water Board: https://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/resolutions/r5-2014-0074_res.pdf

Central Valley Water Board. (2014, June). *Final Report. Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River and the Water Quality Control Plan for the Tulare Lake Basin to Add Policies for Variances from Surface Water Quality Standards.* Retrieved from Point Source Dishcargers, Variance Program for Salinity and Exception from Implementation of Water Quality Objectives for Salinity, Final Staff Report: https://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/variances/variance_final_stfrpt.pdf

Central Valley Water Board. (2015). *Water Quality Control Plan for the Tulare Lake Basin. Second Edition*. Retrieved from http://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/index.shtml

Central Valley Water Board. (2016). *Central Valley Water Board. 2016. The Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basins. Fourth Edition.* Retrieved from Central Valley Water Board: http://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/index.shtml

CV-SALTS. (2016, December). *CV-SALTS. December 2016. Central Valley Region Salt and Nitrate Management Plan. Final Document for Central Valley Water Board Consideration.* Retrieved from https://www.cvsalinity.org/docs/central-valley-snmp/final-snmp.html

Faunt, C. (2009). *Groundwater Availability of the Central Valley Aquifer, California Professional Paper 1766, 225 p.* Reston, VA: U.S. Geological Survey.

Harter, T., Lund, J. R., Darby, J. D., Fogg, G. E., Howitt, R., Jessoe, K. K., . . . Rosenstock, T. (2012). *Addressing Nitrate in California's Drinking Water with a Focus on Tulare Lake Basin and Salinas Valley Groundwater. Report for State Water Resources Control Board Report to Legislature.* Davis, CA: Center for Watershed Sciences, University of California, Davis. Retrieved from http://groundwaternitrate.ucdavis.edu

Howitt, R., Kaplan, J., Larson, D., MacEwan, D., Medellin-Azuara, J., Horner, G., & Lee, N. (2009). *The Economic Impacts of Central Valley Salinity. Final Report to the State Water Resources Control Board Contract 05-417-150-0.* Davis: University of California Davis.

Klimley, P., Chapman, E., Cech, Jr., J., Cocherell, D., Fangue, N., Gingras, M., . . . Wyman, M. (2015). Sturgeon in the Sacramento-San Joaquin Watershed: New Insights to Support Conservation and Management. *San Francisco Estuary and Watershed Science, 13*(4). doi:http://dx.doi.org/10.15447/sfews.2015v13iss4art1

Larry Walker Associates. (2013). *Initial Conceptual Model (ICM) Technical Services. Tasks 7 and 8- Salt and Nitrate Analysis for the Central Valley Floor and a Focused Analysis of Modesto and Kings Subregions Final Report.* San Joaquin Valley Drainage Authority.

Larry Walker Associates. (2016a, October). *Central Valley Salt and Nitrate Management Plan Economics Analysis Report.* Retrieved from prepared for CV-SALTS: http://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/index.shtml

Larry Walker Associates. (2016b, December). *Central Valley Salt and Nitrate Management Plan Antidegradation Analysis.* Retrieved from http://www.cvsalinity.org/index.php/docs/ceqa/ceqa-documents/3646-rev-snmp-antideg-analysis-final-20161202/file.html

Luhdorff & Scalmanini and Larry Walker Associates. (2014, June 18). *Phase II Conceptual Model - Task 3: Groundwater Data Refinements and Updates.* Retrieved from http://www.cvsalinity.org/index.php/docs/committee-document/technical-advisory-docs/conceptual-model-development/2810-phase-iitask-3technical-memorandum070814final/file.html

Luhdorff & Scalmanini and Larry Walker Associates. (2016a, June). *Region 5 Updated Groundwater Analysis and High Resolution Mapping for Central Valley Salt and Nitrate Management Plan.* Retrieved from http://www.cvsalinity.org/index.php/committees/technical-advisory/conceptual-model-developments/171-updated-groundwater-quality-analysis-for-central-valley.html

Luhdorff & Scalmanini and Larry Walker Associates. (2016b). *Alta Irrigation District Management Zone: Aggressive Restoration Alternative Modeling Scenario Results [Memorandum].*

McGowan, W. (2001). *Water Processing, Third Edition.* Water Quality Association.

NASA. (2015, October). *Federal Agencies Release Data Showing California Central Valley Idle Farmland Doubling During Drought.* Retrieved from Landsat Science: https://landsat.gsfc.nasa.gov/federal-agencies-release-data-showing-california-central-valley-idle-farmland-doubling-during-drought/

Natural Resources Conservation Service. (2009). *Agriculture and Greenhouse Gases Fact Sheet.* Portland, OR: Prepared by Air Quality and Atmospheric Change National Technology Development Team. Retrieved from https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs144p2_045134.pdf

Page, R. (1986). *Geology of the Fresh Ground-water Basin of the Central Valley, California, with texture maps and sections.* U.S. Geological Survey Professional Paper 1401-C.

Provost & Pritchard Consulting Group. (2013). Costs to Retrofit Existing Dairies That Do Not Have Tier 1 or Tier 2 Lagoons. *Memorandum to Theresa A. Dunham (Somach, Simmons & Dunn) from John Schapp and Steve Bommelii*.

Provost & Pritchard Consulting Group. (2014). *Kern River Watershed Coalition Authority Surface Water Monitoring Plan.* Retrieved from https://www.waterboards.ca.gov/centralvalley/water_issues/irrigated_lands/water_quality/coalitions/kern_river/surface_water/2014_0804_kern_swmp.pdf

Sacramento River Watershed Program. (2018). *Sacramento River Basin*. Retrieved from http://www.sacriver.org/aboutwatershed/roadmap/sacramento-river-basin

Starr Consulting et al. (2015). *Sacramento River Watershed Sanitary Survey 2015 Update Report.* Retrieved from https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/Sacramento/citysac-26.pdf

State Water Resources Control Board (State Water Board). (2000). *Revised Water Right Decision 1641 In the Matter of: Implementation of Water Quality Objectives for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary.*

State Water Board. (2004). *Turbidity Fact Sheet FS-3.1.5.0 (Turb). .* Retrieved from in the Clean Water Team Guidance Compendium for Watershed Monitoring and Assessment Version 2: http://www.waterboards.ca.gov/water_issues/programs/swamp/cwt_guidance.shtml

State Water Board. (2006). *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary.* Retrieved from State Water Resources Control Board: http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/wq_control_plans/2006wqcp/

State Water Board. (2015, June). *Safe Drinking Water Plan for California: Report to the Legislature in Compliance with Health and Safety Code Section 116365.* Retrieved from http://www.waterboards.ca.gov/publications_forms/publications/legislative/docs/2015/sdwp.pdf

State Water Board. (2017, October 3). *2014 and 2016 California Integrated Report Clean Water Act Sections 303(d) and 305(b).* Retrieved from https://www.waterboards.ca.gov/water_issues/programs/tmdl/docs/final_staff_report.pdf

Tomich, T. P. (2016). *The California Nitrogen Assessment, Challenges and Solutions for People, Agriculture, and the Environment.*

United States Environmental Protection Agency. (1991). *Technical Support Document For Water Quality-based Toxics Control.* Office of Water Enforcement and Permits and Office of Water Regulations and Standards, Washington, D.C.

United States Geological Survey. (1999). *The Quality of Our Nation's Waters-Nutrients and Pesticides.* United States Geological Survey Circular 1225, 82p.

United States Geological Survey. (2017). California's Central Valley. Retrieved May 14, 2018, from https://ca.water.usgs.gov/projects/central-valley/about-central-valley.html

University of California. (2018). *Nitrous Oxide Emissions*. Retrieved from Division of Agriculture and Natural Resources, Solution Center for Nutrient Management: http://ucanr.edu/sites/Nutrient_Management_Solutions/stateofscience/Nitrous_Oxide__In_focus/#N2O%20by the numbers

Water Education Foundation. (2015). *The 2014 Sustainable Groundwater Management Act: A Handbook to Understanding and Implementing the Law.* Retrieved from http://www.watereducation.org/

Western Regional Climate Center. (2018). Retrieved from https://wrcc.dri.edu/Climate/west_lcd.php