CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

Amendment to the Water Quality Control Plan for the Tulare Lake Basin to Remove the Municipal and Domestic Supply (MUN) and Agricultural Supply (AGR) Beneficial Uses from Groundwater Within a Designated Horizontal and Vertical Area Within and Surrounding the Administrative Boundaries of the South Belridge, Monument Junction and Cymric Oil Fields in Kern County Near McKittrick, California

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Table of Contents

List of Tables

List of Figures

List of Appendices

Acronyms and Terms

AB 32 ..... Assembly Bill 32—California Global Warming Solutions Act of 2006, Health & Safety Code section 38500 et seq.

AGR ..... Agricultural Supply Beneficial Use of Water: Uses of water for farming, horticulture, or ranching, including, but not limited to, irrigation, stock watering, or support of vegetation for range grazing.

Alluvium..... Holocene age Alluvium

AMSL ..... Above mean sea level

Anticline ..... Rock formation that has been deformed and folded into the crest of a wavelike structure.

Antidegradation Policy ..... *Statement of Policy with Respect to Maintaining High Quality of Waters in California*, State Water Board Resolution 68-16

Basin Plan..... Water Quality Control Plan for the Tulare Lake Basin (Current Operative Version)

bgs..... Below Ground Surface

BPA ..... Basin Plan Amendment

CalGEM ..... California Department of Conservation, Geologic Energy Management Division (formerly Division of Oil, Gas & Geothermal Resources)

CCE ..... The Corcoran Clay Equivalent is a layer of sandy/clay sediments underlying the alluvium

CCME ..... Canadian Council of Ministers of the Environment's Canadian Environmental Quality Guidelines: Water Quality Guidelines for the Protection of Agriculture (*Livestock*)

CDFW ..... California Department of Fish and Wildlife

CDO..... Cease-and-Desist Order

Central Valley Water Board…… Central Valley Regional Water Quality Control Board

CFR …… Code of Federal Regulation

CEQA..... California Environmental Quality Act, Public Resources Code section 21000 et seq.

Class I & Class II……. A Landfill permitted to accept hazardous and non-hazardous waste

Clean Harbors ……. Clean Harbors Buttonwillow LLC

CRPC ……. California Resources Production Corporation

CV-SALTS …….. Central Valley Salinity Alternatives for Long-Term Sustainability

CWA …… Clean Water Act

DAU ..... Detailed Analysis Unit

DTSC…… Department of Toxic Substance Control

EC ..... Electrical Conductivity

EIR …….. Environmental Impact Report

Facilities …… McKittrick 1-1 and McKittrick 1 & 1-3 together

Ft ……. Feet

GHG..... Greenhouse Gas

GPD ..... Gallons per Day

ILRP..... Irrigated Lands Regulatory Program

IND …….. Industrial Service Supply Beneficial Use of Water: Uses of water for industrial activities that do not depend primarily on water quality, including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well repressurization.

MCLs …… Maximum Contaminant Levels

MDBM..... Mount Diablo Baseline and Meridian

µS/cm ..... Microsiemens per Centimeter

mg/L..... Milligrams per Liter

MRPs…… Monitoring and Reporting Programs Orders

MS4 ……. Phase II Small Municipal Separate Storm Sewer Systems

M/S …….. Monitoring/Surveillance

MUN..... Municipal and Domestic Supply Beneficial Use of Water: Uses of water for community, military, or individual water supply systems, including, but not limited to, drinking water supply.

NAS ……. National Academy of Sciences

NMFS …….. National Marine Fisheries Service

NPDES …… National Pollutant Discharge Elimination System

NRC …… National Research Council

OAL ……. Office of Administrative Law

Porter-Cologne Act …… Porter-Cologne Water Quality Control Act

PRO …… Industrial Process Supply Beneficial Use of Water: Uses of water for industrial activities that depend primarily on water quality.

Produced Wastewater..... Water generated as a result of crude oil production

Project …… This Basin Plan Amendment proposal

Project Area..... Depicted in Figures 1 and 2, a two-dimensional surface area of approximately 14 square miles composed of Sections 13, 14, 23, 24, and the North three quarters of Sections 25 and 26 of Township 29 South, Range 21 East, Mount Diablo Baseline and Meridian (MDBM) and Sections 16 through 21 and the north three quarters of Sections 28 through 30 of Township 29 South, Range 22 East, MDBM

Project Zone ..... A three-dimensional space underlying the Project Area and consisting of the Holocene Alluvium and the Tulare Formation.

REC-1 ..... Water Contact Recreation Beneficial Use of Water: Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white water activities, fishing, or use of natural hot springs.

REC-2 ..... Non-Contact Water Recreation Beneficial Use of Water: Uses of water for recreational activities involving proximity to water, but where there is generally no body contact with water, nor any likelihood of ingestion of water. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.

Regional Boards ..... The nine Regional Water Quality Control Boards of California

Revised Project Area.....Depicted in Figure 2, the proposed two-dimensional area where it has been determined by Central Valley Water Board staff that de-designation of the existing groundwater beneficial uses of MUN and AGR is appropriate.

For one portion of this Revised Project Area, as depicted in Figure 2, it has been determined by Central Valley Water Board staff that de-designation of the existing groundwater beneficial uses of MUN and AGR is appropriate. This portion is composed of an approximately 6.00 square mile two-dimensional surface area composed of: the east quarter of Section 13, the southeast quarter of Section 23, the east half of the southwest quarter of Section 23, the south half and the east quarter of Section 24, the north

quarter of Section 25, the north half of the northeast quarter of Section 26, and the northeast quarter of the northwest quarter of Section 26, of T29S/R21E, MDBM, and Sections 17, 18, and 19, the west quarter of Section 16, the west and north quarters of Section 20, the northwest quarter of the northwest quarter of Section 21, the northwest quarter of the northwest quarter of Section 29, and the north quarter of Section 30, of T29S/R22E, MDBM.

For the remaining portion of the Revised Project Area, also depicted in Figure 2, it has been determined by Central Valley Water Board staff that de-designation of only the existing MUN groundwater beneficial use is also appropriate. This remaining portion of the Revised Project Area is a half square mile two-dimensional area composed of the north half of the northeast quarter of Section 16, the east half of the west half of Section 16, the southwest quarter of the southeast quarter of Section 16, the northeast quarter of the northwest quarter of Section 21, and the northwest quarter of the northeast quarter of Section 21, of T29S/R22E, MDBM.

The horizontal extent of the Revised Project Area was determined by Central Valley Water Board staff evaluating the available data and information in the Project Area, including comparing groundwater quality data to de-designation criteria thresholds. Therefore, the horizontal area proposed for de-designation of the MUN and AGR beneficial uses is what is supported by the currently available information and data for the entire Project Area.

Revised Project Zone……..The proposed three-dimensional space where it has been determined by Central Valley Water Board staff that de-designation of the existing groundwater beneficial uses of MUN and AGR is appropriate. The Revised Project Zone is composed of Holocene Alluvium, is situated

above the CCE, and underlies the Revised Project Area.

SED ..... Substitute Environmental Document per California Code of Regulations, title 23, section 3775 et seq.

Starrh Farms ..... Starrh & Starrh Cotton Growers LP

Syncline ..... Rock formation that has been deformed and folded into the trough of a wavelike structure

Sources of Drinking Water Policy ..... *Sources of Drinking Water Policy*, State Water Resources Control Board Resolution 88-63

SSO ..... Site Specific Objective

State Water Board ..... The California State Water Resources Control Board

T29S/R21E ..... Township 29 South, Range 21 East

T29S/R22E ..... Township 29 South, Range 22 East

TDS ..... Total Dissolved Solids

UIC ..... Underground Injection Control

USACE ..... United States Army Corps of Engineers

USDW ..... Underground Sources of Drinking Water

USEPA ..... United States Environmental Protection Agency

USGS ..... United States Geological Survey

USFWS ..... United States Fish & Wildlife Service

Valley Water ..... Valley Water Management Company

Water Boards ..... The State Water Resources Control Board and the nine Regional Water Quality Control Boards of California

WDRs ..... Waste Discharge Requirements

WILD ..... Wildlife Habitat Beneficial Use of Water: Uses of water that support terrestrial or wetland

ecosystems, including, but not limited to, preservation and enhancement of terrestrial habitats or wetlands, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.

WQO ..... Water Quality Objective

Executive Summary

The purpose of this Staff Report is to provide the rationale and supporting documentation for a proposed amendment to the *Water Quality Control Plan for the Tulare Lake Basin* (**Basin Plan**) to de-designate Municipal and Domestic Supply (**MUN**) and Agricultural Supply (**AGR**) as beneficial uses of groundwater within horizontally and vertically delineated portions of an area both within and adjacent to the administrative boundaries of the South Belridge, Monument Junction, and Cymric Oil Fields in Kern County near the unincorporated community of McKittrick, California. Central Valley Regional Water Quality Control Board (**Central Valley Water Board** or "Board") staff prepared this Staff Report.

The Staff Report provides technical information needed to consider de-designation, or exemption, of MUN and AGR beneficial uses of groundwater situated beneath and adjacent to a hazardous waste disposal facility operated by Clean Harbors Buttonwillow, LLC (**Clean Harbors**) and oil field **produced wastewater** disposal facilities operated by Valley Water Management Company (**Valley Water**) which utilize unlined surface impoundments into which oil field produced wastewater is or has been disposed of after being brought to the surface by oil production operations. Valley Water historically operated or currently operates produced wastewater disposal pond systems at two facilities referred to as the McKittrick 1-1 Facility and McKittrick 1 & 1-3 Facility (together referred to as "**Facilities**") located in the Project Area, which is approximately 4.5 miles northwest of the unincorporated community of McKittrick (2020 population of 102) in western Kern County (See Figure 1). The land surrounding the Facilities is zoned for agricultural use. However, the land use for the area evaluated for de-designation is currently zoned for oil and gas production, agricultural production, industrial use, disposal (landfill), and most of the land is vacant; it is also anticipated that these land uses will continue into the foreseeable future.

Available data shows that groundwater in the alluvium has total dissolved solids (**TDS**) concentrations ranging from approximately 1,740 to 16,000 milligrams per liter (**mg/L**). Groundwater data from the Tulare Formation is limited, but available data shows that the TDS is generally less than 5,000 mg/L. Discharge of produced wastewater to the ponds at the Facilities is regulated under Waste Discharge Requirements (**WDRs**) Resolution No. 69-199 and Monitoring and Reporting Program Orders (**MRPs**) Nos. R5-2018-0808 and R5-2019-0896, and Cease-and-Desist Order (**CDO**) No. R5-2019-0045. The WDRs, MRP, and CDO are overseen by Central Valley Water Board staff (Staff).

The Basin Plan was amended in 1989 to be consistent with State Water Resources Control Board (**State Water Board**) Resolution No. 88-63 (***Sources of Drinking Water Policy***). The 1989 amendment to the Basin Plan designated all surface and ground water bodies in the basin as supporting the MUN beneficial use unless specifically exempted by the Central Valley Water Board and approved for exemption by the State Water Board through a Basin Plan Amendment (**BPA**). Only groundwater areas in Table 2-3 of the Basin Plan are currently exempted from MUN.

The rock formations within the general area have been deformed and folded into wave-like structures (**anticlines** and **synclines**) with axes that trend northwest to southeast and where the rock beds dip to the northeast on the east of the fold axis and to the southwest on the west side of the axis, with rock formations shallowest along the axis and getting progressively deeper the further away from the axis towards the northeast and southwest. The anticline structure also tilts or plunges to the southeast, with rock formations also getting deeper in that direction.

For the purposes of this Staff Report, the **Project Area** is an approximate 14 square mile two-dimensional surface area composed of Sections 13, 14, 23, 24, and the North three quarters of Sections 25 and 26 of Township 29 South, Range 21 East (**T29S/R21E**), Mount Diablo Base and Meridian (**MDBM**) and Sections 16 through 21 and the north three quarters of Sections 28 through 30 of Township 29 South, Range 22 East (**T29S/R22E**), MDBM; it includes portions of the administrative boundaries of the South Belridge, Monument Junction, and Cymric Oil Fields. The Project Area is the two-dimensional area at the ground surface which was evaluated for potential de-designation of beneficial uses of groundwater.

The **Project Zone** is a three-dimensional space consisting of the Holocene Alluvium (**alluvium**) and the Tulare Formation, which was evaluated for de-designation based on available information, including groundwater quality data. Whereas the Project Area reflects the Project's two-dimensional footprint, the Project Zone also encompasses a vertical element. The Project Zone includes sediments that extend to the base of the Tulare Formation within the Project Area. Available data shows that groundwater in the Revised Project Zone has TDS concentrations that exceed 3,000 mg/L, and sometimes exceeds 5,000 mg/L.

Properties within the Project Area include 72 parcels with 27 different owners. Currently most of the land is vacant or used for oil and gas extraction, although it is zoned for agriculture by Kern County. Landfills in the Project Area (**Class I and Class II**) are owned and operated by **Clean Harbors**. Agricultural production operations are by Starrh & Starrh Cotton Growers LP (**Starrh Farms**). The bulk of the oil and gas extraction land is owned by Aera Energy LLC, Chevron USA Inc., and Berry Petroleum. The produced wastewater surface disposal facilities are owned and operated by Valley Water.

As discussed above, the Central Valley Water Board has designated all surface and ground water bodies in the Tulare Lake Basin as supporting the MUN beneficial use unless a particular water body is specifically exempted in Table 2-3 of the Basin Plan. The Basin Plan provides criteria for determining exceptions to the MUN designation.[1]

[1] These criteria mirror the *Sources of Drinking Water Policy's* criteria for determining that groundwater is not suitable for the MUN beneficial use designation.

Criterion (1) applies to water bodies where the TDS exceeds 3,000 mg/L.[2] The Project Zone includes groundwater where water exceeds that TDS threshold and thus may be considered for de-designation of the MUN beneficial use.

The Basin Plan states that unless otherwise de-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)...." The Basin Plan also provides criteria for determining exceptions to the AGR beneficial use. One of those criteria is that there is pollution that cannot reasonably be treated for agricultural use. In the absence of an established salinity water quality objective for the protection of the AGR beneficial use, the Central Valley Water Board relies upon scientific literature to provide salinity threshold concentrations that are generally considered to be protective of AGR. The literature supports a salinity threshold of 5,000 mg/L TDS. The Project Zone includes groundwater where water exceeds that TDS threshold and thus may be considered for de-designation of the AGR beneficial use.

Based on an evaluation of the available information for the Project Area, including groundwater quality data, and comparison to the de-designation criteria thresholds, the de-designation area was changed to include an approximately 6 square mile area (**Revised Project Area)**. Additionally, the Project Zone was revised to include the three-dimensional space where de-designation was found to be appropriate, which only includes the alluvium (**Revised Project Zone)**. The Revised Project Zone includes sediments that extend to the base of the alluvium, approximately 200 to 400 feet below ground surface (**ft bgs**) within the Revised Project Area.

De-designation of groundwater within the Revised Project Zone is consistent with applicable federal and state regulations regarding protection of water quality, including the federal Safe Drinking Water Act, California's Porter-Cologne Water Quality Control Act and the State Water Board's *Sources of Drinking Water Policy*.

De-designation of MUN and AGR beneficial uses in groundwater within the Revised Project Area is not anticipated to result in significant environmental impacts or changes to the region. This is in part because discharges of produced wastewater to the Facilities have occurred for decades and are regulated in waste discharge requirements.

If adopted, this BPA will use the criteria for salinity in the Basin Plan and *Sources of Drinking Water Policy* to de-designate the MUN beneficial use in a horizontally and vertically defined area underlying the Project Area, and the 5,000 mg/L TDS threshold to de-designate the AGR beneficial use.

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[2] This criterion is often referred to as *Exemption 1a* under the *Sources of Drinking Water Policy*.

Specific proposed BPA language is contained in the following section.

Proposed Basin Plan Amendment Language

Modify Chapter 2 of the Basin Plan, adding a **new row** to the bottom of **Table 2-3**, thereby establishing an Exception Area 6 (column 1) with the following Area Description (column 2), which shall be applicable to Detailed Analysis Unit (DAU) #259 (column 3):

> Groundwater contained within the Holocene Alluvium (alluvium), from ground surface to the top of the Corcoran Clay Equivalent (CCE), within the approximately 6.0 square mile two-dimensional surface area composed of: the east quarter of Section 13, the southeast quarter of Section 23, the east half of the southwest quarter of Section 23, the south half and the east quarter of Section 24, the north quarter of Section 25, the north half of the northeast quarter of Section 26, and the northeast quarter of the northwest quarter of Section 26, of T29S/R21E, MDBM, and Sections 17, 18, and 19, the west quarter of Section 16, the west and north quarters of Section 20, the northwest quarter of the northwest quarter of Section 21, the northwest quarter of the northwest quarter of Section 29, and the north quarter of Section 30, of T29S/R22E, MDBM is not suitable, or potentially suitable, for municipal or domestic supply (MUN) or agricultural supply (AGR), including, but not limited to, AGR applications for irrigation, stock watering and support of vegetation for range grazing. Additionally, a half square mile two-dimensional area composed of: the north half of the northeast quarter of Section 16, the east half of the west half of Section 16, the southwest quarter of the southeast quarter of Section 16, the northeast quarter of the northwest quarter of Section 21, and the northwest quarter of the northeast quarter of Section 21, of T29S/R22E, MDBM is not suitable, or potentially suitable, for municipal or domestic supply (MUN).

The language above reflects the Staff-recommended alternatives discussed in this Staff Report.

No further changes to Basin Plan Table 2-3 are proposed at this time.

Section 1: Introduction and Existing Conditions

This document (Staff Report) provides the rationale and supporting documentation for a proposed amendment to the Central Valley Regional Water Quality Control Board's (Central Valley Water Board or "Board") *Water Quality Control Plan for the Tulare Lake Basin* (**Basin Plan**). The amendment will de-designate Municipal and Domestic Supply (**MUN**) and Agricultural Supply (**AGR**) as beneficial uses for groundwater within a horizontally and vertically delineated area underlying the **Project Area** which includes portions outside of oil field boundaries and areas contained within the administrative boundaries of the South Belridge, Monument Junction, and Cymric Oil Fields.

For the purposes of this Staff Report, the Project Area is an approximately 14 square mile, two-dimensional surface area composed of Sections 13, 14, 23, 24, and the north three quarters of Sections 25 and 26 of T29S/R21E, MDBM and Sections 16 through 21 and the north three quarters of Sections 28 through 30 of T29S/R22E, MDBM where de-designation was considered. The boundaries of the Project Area were determined by a Writ of Mandate in the case of *Valley Water Management Company v. California Regional Water Quality Control Board, Central Valley Region* (Kern County Superior Court Case No. BCV-19-101750).

Information provided by Valley Water Management Company (**Valley Water**), Clean Harbors Buttonwillow, LLC. (**Clean Harbors**), the United States Geological Survey (**USGS**), and peer reviewed sources was used to evaluate the groundwater underlying the Project Area and de-designate the AGR and MUN beneficial uses where appropriate. Valley Water operates produced wastewater disposal impoundments (ponds) used for the disposal of oil field produced wastewater. Valley Water operates three disposal pond systems at two facilities named the McKittrick 1-1 and McKittrick 1 & 1-3 Facilities (together referred to as "Facilities") located in western Kern County.

The term "de-designation" is used to reflect the proposed amendment to remove the MUN and AGR beneficial uses from groundwater. However, for the purposes of this Staff Report, the terms de-designation, exemption, and exception are used interchangeably to describe various aspects of this action.

The **Project Zone** is the three-dimensional space consisting of the Holocene Alluvium (alluvium) and the Tulare Formation within the Project Area. Whereas the Project Area reflects the Project's horizontal footprint, the Project Zone also encompasses the Project's vertical element. The Project Zone includes sediments that extend to the base of the Tulare Formation within the Project Area.

The Basin Plan designates groundwater, as with all waters in the Basin, to have beneficial use as MUN unless specifically de-designated in the Basin Plan. The Basin

Plan was amended in 1989 to be consistent with the *Sources of Drinking Water Policy*.[3] The *Sources of Drinking Water Policy* resolved that "all surface and ground waters of the state are considered to be suitable, or potentially suitable, for municipal or domestic water supply and should be so designated by the regional water boards" and provides the criteria that must be met for water to be considered unsuitable for the MUN beneficial use. The 1989 amendment to the Basin Plan designated all surface and ground water bodies in the basin as supporting the MUN beneficial use unless specifically exempted by the Central Valley Water Board and approved for exemption by the State Water Board. Only groundwater areas in Table 2-3 are currently exempted from MUN or other beneficial uses. Thus, if water previously designated as MUN meets at least one of the criteria specified in the Basin Plan (which reflect the criteria in *Sources of Drinking Water Policy*), the removal of that beneficial use is not self-implementing and must be done through a Basin Plan Amendment (**BPA**).

Both the Basin Plan and the *Sources of Drinking Water Policy* identify criteria when considering exceptions to the MUN beneficial use. One of the criteria applies to water bodies where the TDS exceed 3,000 milligrams per liter (mg/L) or 5,000 microSiemens per centimeter (**µS/cm**) conductivity (**EC**), provided that the water body is not expected to supply a public water system.

With regard to the AGR beneficial use, the Basin Plan provides that, unless otherwise de-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)…." Agricultural supply includes the use of groundwater for irrigation, livestock watering, and support of vegetation for range grazing. Like the MUN beneficial use, the Basin Plan provides criteria for the Central Valley Water Board to consider when making any exception to the AGR beneficial use. The first criterion is that 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. Unlike the MUN beneficial use, there is no numeric criterion for determining when TDS levels are high enough to be considered pollution that does not support the agricultural use. Therefore, the Central Valley Water Board must determine the numeric value for TDS when it is no longer protective of the AGR beneficial use. Based on the scientific literature, Board staff will utilize the salinity threshold value of 5,000 mg/L TDS as the upper limit for groundwater quality capable of supporting AGR beneficial use (NRC, 1974). Therefore, groundwater with greater than 5,000 mg/L TDS is eligible for de-designation under the pollution criterion.

This Staff Report describes the proposed BPA and provides the rationale behind de-designation of the MUN and AGR beneficial uses within portions of the Project Area.

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[3] The Central Valley Water Board's Water Quality Control Plan for the Sacramento River Basin and San Joaquin River Basin was similarly amended to be consistent with the *Sources of Drinking Water Policy*.

This report also presents alternatives considered, the public processes utilized, the consideration of California Environmental Quality Act (**CEQA**), an analysis under the State Water Board's Antidegradation Policy (State Water Board Resolution 68-16), and evaluations of the preferred alternatives.

If adopted, this BPA will use the criteria for salinity in the Basin Plan and *Sources of Drinking Water Policy* to de-designate the MUN beneficial use in a horizontally and vertically defined area underlying the Project Area, and the 5,000 mg/L TDS threshold for pollution to de-designate the AGR beneficial use.[4]

1.1 Need for Proposed Amendment

The Project Area is in Kern County and zoned exclusively for agricultural production. However, according to the Kern County General Map, land uses are as follows:

Table 1. Project Area Land Uses. Kern County General Plan September 22, 2009 — Land Use/Conservation/ Open Space Element, Map Code 8.4, p. 54.

Number of Parcels	Land use category	Land use description
4	Agricultural	Farms, crops
9	Industrial	Petroleum, gas
15	Miscellaneous	Governmental, public
23	Vacant	Agricultural/rural
18	Vacant	Residential
3	Vacant	Waste land/marshes[5]

[4] Another Basin Plan Amendment in development may utilize other criteria to propose de-designation of the MUN and AGR beneficial uses within the Project Area and surrounding groundwater areas. The analysis for those criteria is more complex and requires further scientific review. The Central Valley Water Board is under a Writ of Mandate in the case of *Valley Water Management Company v. California Regional Water Quality Control Board, Central Valley Region* (Kern County Superior Court Case No. BCV-19-101750) to complete this Basin Plan Amendment by December 2025 and so is focusing on the salinity criteria for both the MUN and AGR beneficial uses. The other Basin Plan Amendment may lead to additional areas inside the Project Area being de-designated for MUN and AGR beneficial uses based on those other criteria.

[5] Although the three "Waste land/marshes" parcels are listed as vacant, the Clean Harbors landfill Facility occupies one of the three parcels.

The quality of groundwater in portions of the Project Area is inconsistent with use as a source of drinking water in the foreseeable future. The current designation of groundwater as having MUN and AGR beneficial uses in the Basin Plan, does not reflect the current production wastewater disposal use, nor its historical disposal use. Portions of the groundwater in the Project Zone do not qualify as an Underground Source of Drinking Water (**USDW**) under the federal Safe Drinking Water Act. The fact that certain portions of groundwater are covered by default under this Basin Plan's blanket MUN designation creates inconsistency between the actual beneficial uses of the groundwater (given its quality) and the designated MUN and AGR beneficial uses.

1.1.1 Current Application of the MUN Beneficial Use

When the Central Valley Water Board amended the Basin Plan in 1989 to be consistent with the *Sources of Drinking Water Policy*, the Board made a blanket designation that all groundwaters support the MUN beneficial use by default. The Board may only exempt waterbodies from MUN beneficial use designations by amending the Basin Plans and receiving approval for that amendment by the State Water Board. (*California Assn. of Sanitation Agencies v. State Water Resources Control Bd.* (2012) 208 Cal.App.4th 1438, 1463.)

In considering Basin Plan Amendments that will have the effect of de-designating the MUN beneficial use, the Central Valley Water Board utilizes one or more of the following criteria from the Basin Plan and the *Sources of Drinking Water Policy:*

(1) The TDS must exceed 3,000 mg/L (EC exceed 5,000 μS/cm) and the aquifer cannot be reasonably expected to supply a public water system.

(2) 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 either by Best Management Practices or best economically achievable treatment practices.

(3) The water source cannot provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day (gpd).

(4) The aquifer is regulated as a geothermal energy producing source or has been exempted administratively pursuant to Title 40, Code of Federal Regulation (CFR), Section 146.4 for the purpose of underground injection of fluids associated with the production of hydrocarbon or geothermal energy, provided that these fluids do not constitute a hazardous waste under 40 CFR, Section 261.3.

1.1.2 Current Application of the AGR Beneficial Use

The Basin Plan also includes criteria for the Central Valley Water Board to consider when evaluating a proposed exception to other beneficial uses. The criteria are

designed to be consistent with the *Sources of Drinking Water Policy*. The Basin Plan states that in making any exceptions to the beneficial use designation of Agricultural Supply (AGR), the Central Valley Water Board must consider the following criteria:

(1) 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, or

(2) 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; or

(3) The aquifer is regulated as a geothermal energy producing source or has been exempted administratively pursuant to 40 CFR 146.4 for the purpose of underground injection of fluids associated with the production of hydrocarbon or geothermal energy, provided that these fluids do not constitute a hazardous waste under 40 CFR Section 261.3.

To determine when there is pollution that meets the first criterion, the Central Valley Water Board must determine the numeric value for the applicable constituent where it no longer supports agricultural use. For salinity, the Central Valley Water Board must determine what levels do not support the use of groundwater for irrigation, livestock watering, and support of vegetation for range grazing.

The Central Valley Water Board has utilized salinity concentration threshold guidelines identified in Ayers and Westcot (Ayers and Westcot, 1985) and has previously considered irrigation water supply of 470 mg/L TDS (700 µS/cm EC) to be protective of all crops at all times. The Central Valley Salinity Alternatives for Long –Term Sustainability (CV-SALTS) Program is a collaborative initiative among business, government, and community organizations to address nitrate and salt accumulation affecting water supplies in California's Central Valley. As a part of CV-SALTS, a literature review was conducted to investigate salinity impacts on both irrigation and stock watering. This review found that the literature concurred with the Ayers and Westcot finding that only the most salt tolerant crops may be sustainably irrigated with water exceeding 2,000 mg/L TDS (3,000 µS/cm EC) (CV-SALTS, 2012). In addition. Sharif et al., (2019) classify cotton as moderately salt tolerant with a salinity threshold level of 7,700 µS/cm EC (TDS of approximately 5,159 mg/L). As part of the stock watering literature review, CV-SALTS also identified a range of acceptable salt levels for livestock watering (CV-SALTS, 2013), ranging from 3,000 mg/L (5,000 µS/cm EC) (CCME, 2013) to 5,000 mg/L TDS (8,000 µS/cm EC) (NRC, 1974). For purposes of this Basin Plan Amendment, based on the references discussed above, Board staff will utilize the salinity threshold value of 5,000 mg/L TDS as the upper limit for groundwater quality capable of supporting AGR beneficial use.

Other constituents and water quality characteristics (i.e., boron) were not considered for this Basin Plan Amendment. However, it is anticipated that boron concentrations may be considered for the proposed de-designation area in an upcoming Basin Plan Amendment for de-designation of MUN and AGR beneficial uses. That Basin Plan Amendment is anticipated to cover a large portion of western Kern County, including the Revised Project Area.

1.1.3 History of Evaluating Beneficial Uses in Groundwater

Beneficial uses in groundwater within the Tulare Lake Basin have been evaluated in the past, with the most recent comprehensive Basin-wide evaluation occurring in 1993. The Tulare Lake Basin is divided into hydrologic units and satellite basins. Hydrologic units are further subdivided into detailed analysis units (**DAUs**). DAUs and satellite basins are the geospatial areas for which groundwater beneficial uses have been designated.

The following beneficial uses have been identified to occur throughout the Basin:

- Municipal and Domestic Supply (**MUN**)
- Agricultural Supply (**AGR**)
- Industrial Service Supply (**IND**)
- Industrial Process Supply (**PRO**)
- Water Contact Recreation (**REC-1**)
- Non-Contact Water Recreation (**REC-2**)
- Wildlife Habitat (**WILD**)

As previously discussed, under the Basin Plan, all ground waters are designated for MUN beneficial use (the use may be existing or potential), unless specifically exempted per the formal Basin Plan Amendment process.

Portions of two DAUs within the Kern County Basin (254, 259) have received beneficial use de-designations based on Central Valley Water Board determinations that the groundwater there was not potentially suitable for MUN beneficial use. These de-designations are reflected in the first and second rows of Basin Plan Table 2-3.

Additionally, groundwater in the San Joaquin, Etchegoin, and Jacalitos Formations within one-half mile of the Chemical Waste Management Kettleman Hills Facility have been de-designated for MUN. Groundwater underlying the Tulare Lakebed in a number of DAUs (DAUs 238, 241, 243, 244, 246, 255 and part of DAU 259) has also had MUN and AGR beneficial uses removed (Basin Plan, Table 2-3).

The Project Area is located in DAU 259 (Antelope Plain) of the Kern County Basin. Designated beneficial uses for DAU 259 currently include MUN, AGR, and IND beneficial uses.

1.1.4 Stakeholders

Stakeholders for this proposed Basin Plan Amendment are provided in Table 3-2 in this Staff Report. Stakeholders with possible interest in this project include oil production companies, a landfill operator, and agricultural landowners who operate within the proposed Project Area and who may use local groundwater. The Project Area includes parcels that are vacant and undeveloped.

1.2 Background

The Project Area is located in Kern County, west of Interstate 5, and is approximately 4.5 miles northwest of the unincorporated community of McKittrick. It is a mixed-use area dominated by undeveloped land, oil and gas related activities, agriculture, and waste disposal. The surface elevation within the Project Area ranges from approximately 720 feet above mean sea level (AMSL) in the southwest to approximately 365 feet AMSL in the northeast. The Project Area includes portions of the South Belridge, Monument Junction, and Cymric Oil Fields.

Valley Water owns and operates the Facilities. The McKittrick 1-1 Facility is an interconnected produced wastewater disposal pond system with approximately 41 acres of unlined ponds. The McKittrick 1 & 1-3 Facility is also an interconnected produced wastewater disposal pond system with approximately 163 acres of unlined ponds (together the McKittrick 1-1 Facility and McKittrick 1 & 1-3 Facility are the “Facilities”). Disposal of produced wastewater to the pond systems began in 1960. Discharge of produced wastewater to the ponds at the Facilities is regulated under Waste Discharge Requirements (**WDRs**) Resolution No. 69-199 and Monitoring and Reporting Program Orders (**MRPs**) Nos. R5-2018-0808 (for the McKittrick 1 & 1-3 Facility) and R5-2019-0896 (for the McKittrick 1-1 Facility), and Cease-and-Desist Order (**CDO**) No. R5-2019-0045 for the McKittrick 1 & 1-3 Facility.

Produced wastewater is or was piped to the Facilities by oil producers from the nearby oil fields. Discharges to the McKittrick 1 & 1-3 Facility ceased in May of 2021. The McKittrick 1-1 Facility is still active. Produced wastewater quality of the discharge ranges in TDS concentrations from 8,400 to 56,000 mg/L. Valley Water and Clean Harbors have installed monitoring wells and collected data from wells within the Project Zone. TDS data collected from these wells ranges in concentration from 1,740 to 16,000 mg/L. Additionally, within the Project Area, there are three idle underground injection control (**UIC**) wells. Two of the UIC wells are within the boundaries of the South Belridge Oil Field and one is outside of oil field boundaries. The wells located within the South Belridge Oilfield are owned by California Resources Production Corporation. The other UIC well is owned by Valley Water. The UIC wells are regulated under permits issued by the California Department of Conservation, Geologic Energy Management Division (**CalGEM**).

1.2.1 Regional Subsurface Geology

The Project Area is located in the Southwestern San Joaquin Valley which forms the southern part of the larger Central Valley of California. The San Joaquin Valley is bounded to the east by the Sierra Nevada and to the west by the Coast Ranges. The Project Area overlies a zone of deformation (an area where rock formations have been deformed through folding and faulting) located between the San Andreas Fault system to the west and the axis of the San Joaquin Valley to the east. Movement related to slip along the San Andreas Fault system has created geologic deformation structures consisting of folds (synclines and anticlines) and faults. These folds generally trend northwest-southeast parallel to the trend of the San Andreas Fault and resemble waves (**anticlines**) and troughs (**synclines**). The depth and thickness of the regional formations are controlled by the structural uplift and folding during the time of deposition. These sediments thin across the crest of the anticline structures that make the Temblor Range and thicken towards the valley floor to the east.

1.2.1.1 Stratigraphy

Descriptions of stratigraphy used in this Staff Report to describe the geologic formations underlying the Project Area is that used by the USGS including in the publication *Groundwater Salinity and the Effects of Produced Water Disposal in the Lost Hills–Belridge Oil Fields, Kern County, California* (Gillespie et al, 2019). Staff also reviewed the documents titled, *Hydrogeologic Characterization Report, Valley Waste Disposal Company, Cymric Field Study* by Geomega, Inc. and *General Order Three Notice of Intent, Technical Report, McKittrick 1&1-3 Facility, Kern County, California*, which were submitted on behalf of Valley Water in March 2020 by Kennedy Jenks, (referred to as Valley Water Documents). However, Staff have elected to use the stratigraphy and geologic interpretations made by the USGS and not those presented in the Valley Water Documents as the interpretations are more consistent with those provided by surrounding oil and gas operators in the area (e.g., California Resources Production Corporation (CRPC), June 25, 2021, Hydrogeologic Characterization Report (CRPC, 2021)).

The stratigraphy of the southwestern San Joaquin Valley comprises marine sedimentary rocks from the Jurassic through Neogene Periods and poorly consolidated to unconsolidated sediments from Late Tertiary and Quaternary Periods.

The sedimentary units deposited in the region represent deep to shallow marine to brackish water to terrestrial lacustrine and alluvial depositional environments. The sedimentary units consist of a series of Pliocene marine sedimentary rocks overlain by continental sediments of Plio-Pleistocene to Holocene alluvial deposits. The sedimentary Formations that underlie the Project Area from the uppermost unit downward include:

- Holocene Alluvium
- Corcoran Clay Equivalent or CCE

- Pleistocene Tulare Formation
- Pliocene San Joaquin Formation
- Pliocene Etchegoin Formation
- Miocene-Pliocene Reef Ridge Formation
- Miocene Monterey Formation

1.2.1.2 Alluvium

The alluvium is a Holocene age continental deposit of coarse-grained alluvial fan sediments, fluvial channel, and lacustrine coastal plain facies which shed eastward from the Temblor Range, which is west of the Project Area. As the Temblor Range uplifts, sediments erode and are deposited east toward the low elevation San Joaquin Valley.

Alluvial sediments consist of interbedded layers of poorly sorted, relatively coarse grained, subangular to angular sands with silts and clays. Subangular to angular gravelly sands also occasionally occur within the fan sediments. Due to their depositional environment, the sands are heterogenous (vary in grain size), poorly sorted, and generally highly permeable “air sands”, although some lacustrine deposited fine-grain sediments within this alluvium are less permeable. In the Project Area, the alluvium varies in thickness from approximately 200 to 400 feet in thickness and is separated from the underlying Tulare Formation by a clay. The alluvial sediments thicken toward the east and contain high quality groundwater in parts of the San Joaquin Valley where recharge from surface water occurs.

1.2.1.3 Corcoran Clay Equivalent

The basal clay separating the Tulare Formation is known as the Corcoran Clay Equivalent (CCE) and is up to 200 feet thick in some parts of the San Joaquin Valley (Gillespie, et al, 2019). The CCE was deposited in an alluvial to lacustrine environment and vertically separates the alluvium from the underlying Tulare Formation (Gillespie et al., 2019, Everett et al., 2020). Some oil and gas operators in the area refer to this clay as the “basal alluvial clay” in well logs and use it as a defining marker for identifying the underlying Tulare Formation. Within the Project Area, the thickness of the CCE varies from approximately 30 to 80 feet and is encountered at depths ranging from approximately 200 feet bgs to 400 feet bgs in the eastern portion of the Project Area.

The Valley Water Documents identify a regionally extensive, approximately 70-foot-thick clay layer that is a stiff clay bed separating permeable sand-rich layers of sediment, and identify both of these layers as members of the Tulare Formation (i.e., Upper and Lower Members of the Tulare Formation). Valley Water Documents refer to the clay as the “Upper Tulare Clay.” However this report follows the modeling conducted by the United States Geological Survey, which refers to this clay layer as the CCE (USGS, https://webapps.usgs.gov/cogg/model/tularemodel.twig accessed 14 February 2024). Geophysical logs for wells near the Project Area confirm the presence of an extensive, low-permeability layer underlying a sandy-rich layer, including logs for well API No.

0402903672, which shows sands overlying a clay-rich layer encountered at approximately 260 feet bgs (CalGEM).

1.2.1.4 Tulare Formation

The Tulare Formation, which underlies the alluvium and CCE, is the oldest terrestrial formation deposited in the Project Zone. The alluvium and Tulare Formation have similar lithologic compositions as they were deposited in fluvial and lacustrine environments and are sourced from the Coastal Range, except where interfingered with sediments sourced from the Sierra Nevada (Wood and Davis, 1959 and Laudon and Belitz, 1989). The Tulare Formation deposits thicken to the east towards the valley floor.

The Tulare Formation consists of poorly sorted alluvial sandy mudstones, sandstones, and interbedded fine grain mudstones, siltstones and claystones. The Tulare Formation includes several clay units, including the Middle Tulare Clay and Amnicola Clay, that act as confining units within the Tulare Formation. The Middle Tulare Clay separates the Upper and Lower Tulare members of the Tulare Formation (Gillespie, 2019).

1.2.1.5 San Joaquin Formation

Some of the logs and cross-sections in and near the Project Area show the presence of a mudstone interfingered with silty-sands located between the Tulare Formation and Etchegoin Formation, which is sometimes interpreted to be the San Joaquin Formation. The San Joaquin Formation is a transgressive marine sedimentary deposit that is generally not oil and gas producing. The San Joaquin Formation, if present, is likely thin in the Project Area.

1.2.1.6 Etchegoin Formation

The Etchegoin Formation consists of shallow marine deposits of diatomaceous mudstones, sandstones, and siltstones. Sandstone layers within the Etchegoin Formation are poorly consolidated, poorly sorted, and generally permeable. Groundwater sourced from the Etchegoin Formation is generally high in TDS, often exceeding a concentration of 10,000 mg/L. Although marine in origin, it is not a source of oil production within most of the Project Area.

1.2.1.7 Reef Ridge Formation

The Reef Ridge Formation is a diatomaceous marine deposit, encountered underlying the Etchegoin Formation, where it is present. It is generally identifiable in the field by the presence of brown, or grey silty shales. It is silica rich. It is known to contain fossils, including foraminifera. In the Project Area, it is hydrocarbon producing. Some cross sections from areas near the Project Area identify the Reef Ridge as a member of the Monterey Formation.

1.2.1.8 Monterey Formation

The Monterey Formation is a marine deposit that includes the Bent Sand, Antelope Shale, Antelope-McDonald, and the Devil water-Gould Members. The Reef Ridge Member consists of a heterogeneous mix of marine diatomaceous mudstones, sandstones, and siltstones. Most of the production within the Monument Junction Oilfield, the oilfield which encompasses most of the Project Area, is from the Bent Sand, and Antelope Shale Members of the Monterey Formation. The Monterey Formation is the source rock for much of the petroleum extracted in Kern County.

1.2.2 Surface Water

Currently, natural surface water flow is extremely intermittent and results from infrequent storms during the winter and spring months. The area receives little precipitation, with the nearby unincorporated community of Buttonwillow averaging 6.4 inches per year,[6] which is substantially less than the statewide annual average rainfall (22.9 inches[7]). Due to the semi-arid to arid climate of the area, recharge in the form of precipitation is minimal.

1.2.3 Groundwater

The gradient and flow direction are based on groundwater elevation measurements, contour maps, and iso-concentration maps of the Project Zone. Groundwater flows generally towards the northeast, toward the center of the San Joaquin Valley.

The CCE, as described in the USGS model referenced above and recent literature (Gillespie et al., 2019), acts as a confining layer where present. The CCE allows for the creation of two separate and distinct aquifers in the Project Area. In general, where there is naturally occurring groundwater in the alluvium, the aquifer may naturally have groundwater of a high quality (< 1,000 mg/L TDS) (Gillespie et al., 2019). However, it may have been degraded by surface disposal in some parts of the Central Valley, especially where oil production occurs (Gillespie et al., 2019, Gillespie et al., 2022).

The Tulare Formation, which underlies the CCE, can also contain an aquifer, but the natural quality is much lower (> 4,000 mg/L TDS), especially where there is little surface recharge, like in the dry western portions of the San Joaquin Valley (Gillespie et al., 2022). In the Project Area, difference between the natural qualities of the aquifers is likely controlled by the CCE, as there is little hydraulic communication between the alluvium and the Tulare Formation, which is described below.

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[6] https://www.usclimatedata.com/climate/buttonwillow/california/united-states/usca0146 accessed 9 October 2023.

[7] https://oehha.ca.gov/epic/changes-climate/precipitation accessed 9 October 2023.

1.2.3.1 Groundwater Quality

Monitoring wells within the Project Area are screened in both the alluvium and Upper member of the Tulare Formation. Within the Project Area, TDS concentrations in groundwater within the alluvium range from approximately 1,740 mg/L to 16,000 mg/L and in the Revised Project Area range from approximately 4,200 mg/L to 16,000 mg/L. TDS concentrations in groundwater within the Upper member of the Tulare Formation range from approximately 2,300 mg/L to 5,500 mg/L. Maps showing TDS concentrations in the alluvium and Tulare Formation (Upper Member of the Tulare Formation) are included in this Staff Report as Figures 2 and 3.

Additional data is needed to fully characterize groundwater quality within the south-southeastern and north-northwestern portions of the Project Area. Data gap areas include Section 14, parts of Sections 13, 23, 24, 25, and 26 of T29S, R21E, MDB&M and parts of Sections 20, 21, 28, 29, and 30 of T29S, R22E, MDB&M (Figure 2).

Additionally, the Project Zone has insufficient groundwater data to evaluate de-designation for the Tulare Formation. The top of the Tulare Formation is encountered at approximately 300 ft bgs and extends to a depth of approximately 1,630 ft bgs (Figure 4). The deepest groundwater monitoring well within the Project Zone is completed to a total depth of 490 ft bgs in the Tulare Formation. Due to the limited groundwater quality data available for the entire vertical extent of the Tulare Formation, additional data is needed to fully characterize groundwater quality within the whole of the Project Zone. Therefore, insufficient groundwater quality data is available to fully evaluate if groundwater within the entire Tulare Formation meets the de-designation threshold criteria.

1.2.3.2 Groundwater Use

Groundwater within the vicinity of the Project Area varies in quality due to factors that include discharges of produced wastewater to the Facilities and low natural recharge. There are few wells in the Project Area used for water supply. Water supply wells in the Project Area have the following designations:

- Agricultural irrigation (Well WW-3 owned by Starrh Farms)
- Industrial supply (New Well V owned by Clean Harbors)

1.2.4 Surface Features

Developed parts of the Project Area consist of oil field production facilities including production and disposal wells, pipelines, utilities, access roads, and disposal ponds. There is also a solid waste disposal facility operated by Clean Harbors, and a portion of the Project Area is used for agricultural production operated by Starrh Farms. An aerial photograph depicting the Project Area is included in this Staff Report (Figure 1).

No cities or communities are located in the Project Area. The nearest community to the Project Area is the unincorporated community of McKittrick, located at the junction of

Highway 33 and Highway 58, that is approximately 4.5 miles southeast of the Project Area. McKittrick encompasses approximately 2.6 square miles of western Kern County. According to census data, the population of McKittrick was 102 persons in 2020. Municipal water for the community of McKittrick is surface water sourced from outside of the region. No other communities or homes use water from the Project Area for municipal or domestic supply.

Section 2: Laws, Plans and Policies Relevant to Basin Planning

In enacting the Porter-Cologne Water Quality Control Act (Porter-Cologne Act), Water Code section 13000 et seq., 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 each of the nine Regional Water Quality Control Boards (Regional Boards) (collectively, "Water Boards") are the State agencies with primary responsibility for coordination and control of water quality. (Wat. Code, §§ 13100, 13200, 13225.) Each Regional Board, including the Central Valley 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. (*Id*., § 13240.) These "basin plans" designate beneficial uses of water; water quality objectives (WQOs) to protect such uses; and a program of implementation to achieve the objectives. (*Id*., §§ 13241-13242.) Once adopted, "basin plans" must be periodically reviewed and may be revised. (*Id*., § 13240.)

Under the federal Clean Water Act (33 U.S.C. § 1251 et seq.), states are required to adopt water quality standards for surface waters. Water quality standards, as defined in Clean Water Act section 303(c), consist of the designated beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.) of a water body and water quality criteria necessary to protect the beneficial uses. A difference between the state and federal programs is that California's "basin plans" establish beneficial uses and water quality objectives (WQOs) for groundwaters in addition to surface waters. Accordingly, basin plans contain designated beneficial uses and protective WQOs for groundwater.

Regional Boards adopt and amend "basin plans" through a structured process involving scientific peer review, public participation, and environmental review. This process is referred to as a Basin Plan Amendment. In undertaking this process, Regional Boards are required to comply with the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.).

Although the Secretary of Natural Resources has certified the basin planning process as "exempt" from the CEQA requirement to prepare an environmental impact report (EIR) or other appropriate environmental document (*Id*., § 21080.5; Cal. Code Regs., tit. 14, § 15251, subd. (g)), State Water Board regulations on its exempt regulatory programs require the Regional 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.).

Basin Plan Amendments are not effective until they are approved by the State Water Board and the regulatory provisions are approved by the State Office of Administrative Law (OAL).

Although United States Environmental Protection Agency (USEPA) review and approval is required for Basin Plan Amendments that add or modify water quality standards for certain surface waters (i.e., jurisdictional waters of the United States), this particular Basin Plan Amendment is strictly limited to groundwater. Accordingly, USEPA review and approval will not be required.

The Project Alternatives presented in this Staff Report discusses potential changes to the Basin Plan in the areas of Beneficial Uses, WQOs, and Implementation. Therefore, State laws, plans, or policies pertaining to these three areas of the Basin Plan are described below. The preferred alternative is evaluated for consistency with relevant laws, plans, and policies is presented in this Staff Report.

2.1 Regulations that Apply to Beneficial Uses

2.1.1 Federal Regulations and Guidance

Federal regulations require the protection of designated uses in all (surface) waters of the United States as specified by the Clean Water Act (CWA). Federal regulations establish special protections for the uses specified in section 101(a)(2) (33 U.S.C. § 1251). However, Section 101(a)(2) only pertains to surface waters, and, since the current project is only concerned with potential impacts to groundwater, these federal regulations do not apply.

The federal Safe Drinking Water Act (42 U.S.C. § 300f et seq.) was originally passed by Congress in 1974 to protect public health by regulating the nation’s public drinking water supply (EPA, 2004). The law was amended in 1986 and 1996 and requires action to protect drinking water sources including rivers, lakes, reservoirs, springs, and groundwater wells. It authorizes the EPA to set national health-based standards for drinking water to protect against both naturally occurring and man-made contaminants. Among the water quality criteria that have been established under the Act, groundwater may be considered an Underground Source of Drinking Water (USDW) if its Total Dissolved Solids (TDS) concentration is below 10,000 mg/L. Groundwaters with TDS in excess of 10,000 mg/L are considered non-USDWs.

2.1.2 State Regulations and Guidance

The Water Code includes designation of beneficial uses in both basin plans and statewide plans. Section 13050, subdivision (j) of the Water Code defines beneficial uses of water as including, but not limited to the following examples:

- Domestic, municipal, agricultural, and industrial supply
- Power generation
- Recreation

- Aesthetic enjoyment
- Navigation
- Preservation and enhancement of fish, wildlife, and other aquatic resources or preserves.

Basin Plan Table 2-1 specifies the beneficial uses for surface water, whereas Basin Plan Table 2-2 specifies the beneficial uses of groundwater—the latter of which is affected by this proposed Basin Plan Amendment.

The potential beneficial uses of groundwater are:

- Municipal and Domestic Supply (MUN)
- Agricultural Supply (AGR)
- Industrial Service Supply (IND)
- Industrial Process Supply (PRO)
- Water Contact Recreation (REC-1)
- Non-Contact Water Recreation (REC-2)
- Wildlife Habitat (WILD)

By default, all ground waters are considered suitable or potentially suitable, at a minimum, for agricultural supply (AGR), industrial supply (IND), and industrial process supply (PRO). Groundwater areas exempted from MUN are included in Basin Plan Table 2-3.

The Project Area for the proposed Basin Plan Amendment is located in Detailed Analysis Unit (DAU) number 259 of the Kern County Basin Hydrologic Unit of the Tulare Lake Basin. Based on Table 2-2 of the Basin Plan, beneficial uses designated for Detailed Analysis Unit 259 include MUN, AGR, and IND.

2.2 Sources of Drinking Water Policy, State Water Board Resolution 88-63

Adopted by the State Water Board via Resolution 88-63, the *Sources of Drinking Water Policy* establishes State policy that, subject to certain exceptions, all waters are considered suitable or potentially suitable to support the MUN beneficial use.

The Basin Plan was amended in 1989 to be consistent with the *Sources of Drinking Water Policy*. The 1989 amendment to the Basin Plan designated all surface and ground water bodies in the basin as supporting the MUN beneficial use unless specifically exempted by the Central Valley Water Board and approved for exemption by the State Water Board through a BPA. Only groundwater areas in Table 2-3 of the Basin Plan are currently exempted from MUN. The Basin Plan and the *Sources of Drinking Water Policy* identify exception criteria that the Board will use to de-designate the MUN beneficial use.

The *Sources of Drinking Water* Policy identifies the following exceptions that may be used to de-designate MUN beneficial use:

1. In surface and groundwaters where the total dissolved solids (TDS) exceed 3,000 mg/L (5,000 μS/cm, electrical conductivity [EC]), and it is not reasonably expected by Regional Boards to supply a public water system;

2. In surface and groundwaters where there is contamination, either by natural processes or by human activity (unrelated to a specific pollution incident), that cannot reasonably be treated for that domestic use using either Best Management Practices or best economically achievable treatment practices;

3. In surface and groundwaters where 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; or

4. In groundwaters where the aquifer is regulated as a geothermal energy producing source or has been exempted administratively for the purpose of underground injection of fluids associated with the production of hydrocarbon or geothermal energy, provided that these fluids do not constitute a hazardous waste.

The *Sources of Drinking Water Policy* only addresses the designation of water as a drinking water source; it does not establish WQOs for constituents that are protective of MUN beneficial use.

2.3 Regulations that Apply to Water Quality Objectives (WQOs)

2.3.1 Federal Regulations and Guidance

Federal regulations require States to adopt narrative or numeric water quality criteria to protect designated beneficial uses of surface waters within federal jurisdiction. (40 C.F.R. § 131.11(a)(1).) As noted above, this Basin Plan Amendment does not apply to any surface waters and is not setting any WQOs.

2.3.2 State Statute, Regulations and Guidance

WQOs 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. (Wat. Code, § 13050, subd. (h).)

Pursuant to Water Code section 13241, when establishing WQOs, the Regional Boards are required to consider the following:

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.

g. The Program of Implementation per Water Code section 13242.

2.4 Regulations to Establish an Implementation Program

2.4.1 Federal Regulations and Guidance

Section 402 of the Clean Water Act (33 U.S.C. § 1342) establishes the National Pollutant Discharge Elimination System (NPDES), a permitting system for surface waters. USEPA regulations for the NPDES are codified in title 40, part 122 of Code of Federal Regulations. The State's regulations pertaining to NPDES permits must be consistent with the federal regulations. However, the Project Area does not currently receive discharges subject to the NPDES. Accordingly, these federal regulations are not applicable to the proposed Basin Plan Amendment.

2.4.2 State Statute, Regulations and Guidance

2.4.2.1 Wat. Code 13050

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 prescribes the program of implementation for achieving water quality objectives, which include the following:

- A description of the nature of actions which are necessary to achieve the water quality objectives, including recommendations for appropriate action by an entity, public or private;
- A time schedule for the actions to be taken; and
- A description of a monitoring and surveillance program to determine compliance with water quality objectives.

Since this Basin Plan Amendment proposes to de-designate MUN and AGR beneficial uses within the Project Area, no implementation plan is required.

2.4.2.2 Monitoring Program (*Sources of Drinking Water Policy*)

Per the *Sources of Drinking Water Policy*, monitoring is required for application of Exception 2b where the water is in agricultural drainage systems. Since the proposed project does not seek to de-designate MUN beneficial use in the proposed MUN de-designation boundary based on Exception 2b, monitoring the groundwater is not required to be part of this Basin Plan Amendment.

2.4.2.3 Human Right to Water (Wat. Code, § 106.3)

As codified in 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. The Project Area is not currently zoned for residential nor is it anticipated to be zoned residential in the future. As described in this Staff Report, existing groundwater quality within portions of the Project Zone does not support MUN use and the MUN beneficial use is proposed to be de-designated in this BPA in those portions. Therefore, this water code section is not applicable.

Section 3: Evaluation of the Project Zone

3.1 Characteristics of the Project Zone

The Project Area is located in DAU 259 (Antelope Plain) of the Kern County Basin. Designated beneficial uses in the Basin Plan for DAU 259 currently include MUN, AGR, and others. The Project Zone proposed for MUN beneficial use de-designation comprises the alluvium and the Upper Tulare Member of the Tulare Formation within the Project Area.

First encountered groundwater is found in the alluvium at depth of approximately 120 ft bgs near the center of the Project Area. Alluvial sediments consist of interbedded layers of poorly sorted, relatively coarse grained, subangular to angular sands with silts and clays. In the Project Area the alluvium varies in thickness but can be as thick as 400 feet. The alluvium is separated from the underlying Tulare Formation by the CCE.

Tulare Formation is divided into two major member units – the Upper Tulare Member and the Lower Tulare Member, each consisting of interbedded layers of mudstone, siltstone, and sandstone. The sandstone is poorly consolidated, and poorly sorted (very fine, fine, medium to coarse grained, with moderate amounts of clay and silt-sized grains). The Middle Tulare Clay separates the Upper and Lower Tulare members of the Tulare Formation.

3.2 Past, Present and Future MUN and AGR Uses

Copies of Kern County Assessors Maps were used to identify surface land uses in this Staff Report. County land-use codes for the surface parcels include the following:

- Irrigated land
- Refineries
- Grazing or dry farmland
- Orchard
- Undeveloped land
- Oil production

3.3 Proposed De-Designation Boundary

Based on an evaluation of existing groundwater quality within the Project Area, the de-designation area was revised to include an approximately 6 square mile two-dimensional surface area composed of: the east quarter of Section 13, the southeast quarter of Section 23, the east half of the southwest quarter of Section 23, the south half and the east quarter of Section 24, the north quarter of Section 25, the north half of the northeast quarter of Section 26, and the northeast quarter of the northwest quarter of Section 26, of T29S/R21E, MDBM, and Sections 17, 18, and 19, the west quarter of Section 16, the west and north quarters of Section 20, the northwest quarter of the

northwest quarter of Section 21, the northwest quarter of the northwest quarter of Section 29, and the north quarter of Section 30, of T29S/R22E, MDBM, exceeds a TDS concentration of 5,000 mg/L which is not suitable, or potentially suitable, for agricultural or municipal and domestic supply (Revised Project Area). Additionally, a fragmented half square mile two dimensional area composed of: the north half of the northeast quarter of Section 16, the east half of the west half of Section 16, the southwest quarter of the southeast quarter of Section 16, the northeast quarter of the northwest quarter of Section 21, and the northwest quarter of the northeast quarter of Section 21, of T29S/R22E, MDBM, exceeds a TDS concentration of 3,000 mg/L which is also not suitable, or potentially suitable, for municipal or domestic supply (MUN). There is one well within this area where TDS exceeds 5,000 mg/L, but it is situated next to a well with monitoring data below TDS of 5,000 mg/L (3,900 mg/L), and therefore MUN de-designation is appropriate, but AGR de-designation is not appropriate for this fragmented section of the Project Area.

Based on information regarding the Project Zone, including groundwater quality data, the Revised Project Zone is limited to the alluvium underlying the Revised Project Area, where MUN and AGR de-designation has been deemed appropriate based on available data. The Revised Project Zone includes sediments that extend to the top of the Tulare Formation within the Revised Project Area. Whereas the Revised Project Area reflects the Project's horizontal footprint, the Revised Project Zone also encompasses the Project's vertical element. In other words, the Revised Project Area encompasses the Revised Project Zone that is vertically limited by the CCE.

3.4 Stakeholder Identification

No water supply wells for municipal or domestic use are located within the Project Area. There are two water supply wells within the Project Area, one which is reported to supply industrial water (owned by Clean Harbors), and one is designated as an agricultural supply well operated by Starrh Farms. However, irrigation water in the Revised Project Area is imported surface water, and the use of the Starrh Farms well is reportedly limited. Land use includes irrigated land, petroleum and gas development, land disposal, and undeveloped land. The main surface property owners in the Project Area include oil and gas operators and one agricultural production operator as listed in the table below:

Table 3. Stakeholders - Current Landowners within the Project Area

Landowners
Abbott Richard Revocable Trust
Aera Energy LLC
Alma Investing Co.
Berry Petroleum Co.

Landowners
Chevron U.S.A. Inc.
Clean Harbors Buttonwillow LLC
Felker Patricia A Trust
Sentinel Peak Resources Cal LLC
Starrh & Starrh Cotton Growers LP
Valley Water Management Company
Vaquero SJV LLC
Ware Family Partners L P

Section 4: Project Alternatives

The technical and regulatory analysis considered information relevant to the proposed de-designation of MUN and AGR beneficial uses of groundwater in the Project Zone. The information evaluated includes subsurface geologic conditions, the location of existing water supply wells, groundwater flow, and groundwater quality. The findings of the evaluation provided a basis for recommending specific horizontal and vertical boundaries for de-designation of the MUN and the AGR irrigation supply and the AGR livestock watering beneficial uses.

4.1 MUN Beneficial Use Alternatives, Evaluation and Recommendation

Board staff identified the following project alternatives pertaining to the MUN beneficial use designation for a portion of the groundwater beneath the Project Area:

Alternative 1: No Action;

Alternative 2: De-designate MUN Beneficial Use within the Revised Project Area horizontal boundaries from the surface down, with no vertical de-designation boundary, where groundwater meets the salinity criterion in the Basin Plan based on existing groundwater quality;

Alternative 3: De-designate MUN Beneficial Use within the Revised Project Area horizontal boundaries within specific depth zones where groundwater meets the salinity criterion in the Basin Plan based on existing groundwater quality, where data is available; or

Alternative 4: Development of MUN Site-Specific Salinity Water Quality Objectives within the Revised Project Area boundaries. Site-specific water quality objectives must protect the beneficial uses of a water body and must be developed in accordance with all applicable laws and regulations based on sound scientific rationale and must be adopted by the Central Valley Water Board in a Basin Plan Amendment.

General components of each of the MUN regulatory project alternatives are included in this Staff Report and summarized in the table below.

Table 4-1. Project Alternatives: MUN Use De-Designation Consideration in the Project Area.

Project Alternatives	Beneficial Use Designation Components	Water Quality Objective (WQO) Components	Implementation Program Components	Monitoring/ Surveillance (M/S) Components
Alternative 1: No Action	No Change in MUN Beneficial Use Designation	No New WQOs	No New Implementation Program	No New Monitoring and Surveillance Program
Alternative 2: De-designate MUN beneficial use for all groundwater in Revised Project Area (no vertical boundaries) based on TDS	Use technical and regulatory analyses to support de-designation of MUN beneficial use	MUN WQOs will no longer apply to groundwater within a specific area of the Revised Project Area	Existing Regulatory Programs to Implement	Monitoring Utilizing Current Existing Regulatory Programs and Consider Expanding the Current Monitoring Well Network to Fill Data Gaps
Alternative 3: De-designate MUN within Distinct Portions of the Revised Project Zone based on TDS	Use the salinity criterion in the Basin Plan based on existing groundwater quality and supporting evidence to de-designate MUN beneficial use	MUN WQOs no longer apply to groundwater in specific zones having groundwater salinity concentration levels greater than 3,000 mg/L TDS (EC of 5,000 µS/cm) as defined by proposed boundaries identified in this Staff Report	Existing Regulatory Programs to Implement	Monitoring Utilizing Current Existing Regulatory Programs and Consider Expanding the Current Monitoring Well Network to Fill Data Gaps
Alternative 4: Development of MUN Site-Specific Salinity Objectives in Project Zone	Re-designate Beneficial Use as Limited-MUN	Develop Individual Site-Specific Objectives (SSOs) that maintain existing concentrations	Existing Regulatory Programs to Implement	Adjust Existing Regulatory Programs to Account for New Objectives

4.1.1 MUN Alternative 1: No Action

Under MUN Alternative 1 (No Action), the Basin Plan would not be amended, and the groundwater of the alluvium would retain the MUN designation. However, under this scenario dischargers would retain an undue responsibility under the Basin Plan to protect groundwater in portions of the Project Area where groundwater meets one or more of the exception criteria under the Basin Plan, as described above.

4.1.2 MUN Alternative 2: De-Designation in Revised Project Area without Vertical Boundaries

Under MUN Alternative 2, the MUN beneficial use would be de-designated over the entire Project Area from the surface down, with no vertical delineation.

The Basin Plan and the *Sources of Drinking Water Policy* include criteria for considering an exception to the MUN designation for surface and ground waters where “the total dissolved solids (TDS) exceed 3,000 mg/L (5,000 µS/cm, electrical conductivity [EC]) and is not reasonably expected by Regional Boards to supply a public water system.” A portion of the Project Area features groundwater with TDS concentrations greater than 3,000 mg/L and is thus eligible for MUN de-designation under this criterion. However, the proposed Project Area also includes areas where groundwater has TDS concentrations less than 3,000 mg/L in the Upper Tulare member of the Tulare Formation and thus, the currently proposed Project Area in its entirety is not eligible for MUN de-designation under this criterion. Additionally, insufficient data is available to fully characterize the vertical and lateral extent of water quality in the Project Zone. Under the Basin Plan, de-designation is only allowed where there is sufficient data to demonstrate that the groundwater meets one of the criteria in the Basin Plan and *Sources of Drinking Water Policy*.

4.1.3 MUN Alternative 3: De-Designation Only in the Revised Project Zone

Alternative 3 is a more limited version of Alternative 2 where the MUN beneficial use would only be de-designated from groundwater within the Revised Project Zone in accordance with the Basin Plan’s and the *Sources of Drinking Water Policy’s* criteria for TDS described above, based on available groundwater data collected from the evaluated Project Zone. Specifically, the MUN beneficial use is to be de-designated from groundwater situated within the alluvium in the Revised Project Zone which includes an approximately 6 square mile area underlying the evaluated Project Area. Additionally, a fragmented half square mile area in the eastern portion of the evaluated Project Area is also not suitable, or potentially suitable, for municipal or domestic supply (MUN). Shallow groundwater outside the Revised Project Area and Revised Project Zone would retain the MUN designation.

Groundwater quality in the Revised Project Zone, as described above is currently poor, such that it satisfies the criterion for de-designation of MUN based on TDS levels (TDS >3,000 mg/L). In addition, landowners have not relied upon the groundwater for drinking water within the proposed Revised Project Area boundary for MUN de-designation and do not expect the area to support the use in the foreseeable future.

4.1.4 MUN Alternative 4: Site-Specific Objectives (SSOs) for Salinity for All Groundwater within the Project Zone

MUN Alternative 4 would involve changes to the Basin Plan pertaining to beneficial uses and WQOs for groundwater in the Project Area. This alternative would involve a change in the beneficial use designation of groundwater in the Project Area from MUN to a new "Limited-MUN" designation. The development of site-specific objectives (SSOs) for constituents of concern for the groundwater would be developed based on existing ambient groundwater concentrations. Where groundwater currently does not meet MUN and MUN-related WQOs due to naturally occurring background concentrations, controllable factors, such as agriculture or disposal operations, would not be allowed to further degrade existing water quality under this alternative. Groundwater designated as having a "Limited-MUN" beneficial use would need to be treated or blended prior to use as municipal and domestic supply. Existing regulatory programs would be responsible for implementing the monitoring and surveillance program needed to assure that waste discharges do not further degrade existing ambient groundwater concentrations in a site-specific area, including the maximum average annual increase in EC allowed by the Basin Plan.

4.1.5 Evaluation of Project Alternatives

The above-described MUN Basin Plan Amendment alternatives were evaluated based on their ability to meet the following:

1. Consistency with Applicable Federal and State Statutes and Regulations[8] for Protection of Water Quality (e.g., *Sources of Drinking Water Policy*, *Antidegradation Policy*, etc.)

2. Applicability of Criteria in the Basin Plan and the *Sources of Drinking Water Policy*

3. Protection of Existing and Future Potential Beneficial Uses

4. Technical Feasibility, Economic Viability, and Reasonableness of Action

[8] Water Quality Control Plans and State Policy For Water Quality Control have the same legal effect as regulations. (See Gov. Code, § 11353; Wat. Code, §§ 13140 et seq., 13241 et seq.)

5. Existing Data

6. Support for Socioeconomic Wellbeing of Project Area

7. Ease of Implementation

Each MUN project alternative was evaluated with regard to how well it satisfies each criterion. A scale of “low”, “medium”, and “high” was used to rank how well an alternative meets a criterion. The low, medium, and high rankings are characterized as follows:

Low Alternative largely does not satisfy criterion

Medium Alternative satisfies criterion, in part

High Alternative largely satisfies criterion

A ranking of each proposed MUN project alternative with respect to the criteria is provided and a Table 4-2 description of the assumptions and rationale used when ranking each MUN project alternative is provided below.

Table 4-2. MUN Consideration: Evaluation of Project Alternatives

MUN Project Alternatives	Criterion 1: Consistent w/ Federal/ State Laws	Criterion 2: Groundwater Meets Criteria for De-Designation Based on TDS Levels	Criterion 3: Protects Beneficial Uses	Criterion 4: Technical Feasibility, Economic Viability, Reasonable Action	Criterion 5: Existing Data	Criterion 6: Socio-economic Wellbeing	Criterion 7: Ease to Implement
Alternative 1: No Action	High	Low	High	Low	Low	Low	High
Alternative 2: De-Designate MUN in Revised Project Area w/o Vertical Boundaries, based on TDS	Low[9]	Low	Low	Med	Low	Med	Med
Alternative 3: De-Designate MUN within Parts of Revised Project Zone, based on TDS	High	High	High	High	High	High	High

[9] Absence of vertical limit to de-designation boundary could deny certain geographic areas a beneficial use that is currently supported by existing water quality at some vertical depth (e.g., groundwater upgradient, downgradient, and within the Upper Tulare member in the revised Project Area).

MUN Project Alternatives	Criterion 1: Consistent w/ Federal/ State Laws	Criterion 2: Groundwater Meets Criteria for De-Designation Based on TDS Levels	Criterion 3: Protects Beneficial Uses	Criterion 4: Technical Feasibility, Economic Viability, Reasonable Action	Criterion 5: Existing Data	Criterion 6: Socio-economic Wellbeing	Criterion 7: Ease to Implement
Alternative 4: Site-Specific Salinity Objectives in the Project Zone	High	Low	High	Low	Low	Low	Low

4.1.6 Staff Recommendation: MUN Alternative 3

Based on analysis of the four alternatives discussed above, Central Valley Water Board staff recommends implementation of **MUN Alternative 3**, wherein MUN beneficial use shall be de-designated for groundwater in portions of the Project Zone only - i.e., the alluvium within the horizontal and vertical boundaries of the Project Zone where data shows that groundwater meets the criteria in the Basin Plan for de-designation (i.e., portions underlying the evaluated Project Area within the alluvium where TDS concentrations exceed 3,000 mg/L). Maps showing where groundwater quality in the alluvium meets this threshold is discussed above and included in this Staff Report (Figure 2).

MUN Alternative 3 **is recommended** and best satisfies the selection criteria described in Section 4.1.5. A limited de-designation within the Project Zone constrained to specific parts of the alluvium would:

1. Be consistent with both federal and state water quality laws and policies. Notably, the Revised Project Zone proposed for MUN de-designation meets the salinity threshold for de-designation under the TDS criteria described in the Basin Plan and the *Sources of Drinking Water Policy*.

2. Be the appropriate protection for the groundwater in the Revised Project Zone. The proposed de-designation zones have no past, current, or planned future use for municipal or domestic supply due to high salinity of the groundwater as a result of current and historical produced wastewater discharges to the Facilities and therefore, need not be protected for MUN use.

3. Ensure that existing and future potential beneficial uses of groundwater resources outside (upgradient, downgradient, and beneath) the Project Area boundaries have been accounted for.

4. Be the most beneficial and cost-effective measure because it does not require extensive scientific review and development of SSOs or additional costly measures to avoid groundwater quality degradation and/or meet MUN-related WQOs in a zone with no potential to sustainably supply a municipal or domestic water supply.

5. Find it appropriate that dischargers in the Project Area are not required to implement new treatment processes or other control measures to avoid groundwater quality degradation and/or meet MUN-related discharge limitations in Waste Discharge Requirements (WDRs) when no such use currently exists or is anticipated to exist for this groundwater and their discharge does not impact areas outside the Revised Project Zone that remain designated for MUN.

Implementation of MUN Alternative 1 (No Action) is **not recommended** for the following reasons:

1. Nonaction would be inconsistent with the enumerated criteria under the Basin Plan and the *Sources of Drinking Water Policy*, which contemplate de-designation where existing water quality clearly does not support MUN beneficial use.

2. Nonaction could result in costly treatment measures for municipal supply that would be required to protect the MUN use for groundwater that is not currently and will never be suitable for this use.

Implementation of MUN Alternative 2 (de-designation in the Project Area without vertical boundaries) is also **not recommended** for the following reasons:

1. This alternative would de-designate the MUN beneficial use in the underlying aquifers below the CCE, where insufficient data is available from within the Project Area to fully characterize the vertical and lateral extent of water quality. The Basin Plan only allows the Central Valley Water Board to consider de-designation where the groundwater meets one of the enumerated criteria. Therefore, de-designation of the entire vertical and lateral extent of groundwater within the Project Zone without sufficient data is inconsistent with the Basin Plan.

2. This alternative is viewed as unnecessarily limiting beneficial use protection in the Project Area and does not add any additional benefit over Alternative 3, it is therefore eliminated from further consideration and no specific environmental, antidegradation, or economic analyses are conducted for it.

Implementation of MUN Alternative 4 (Development of MUN site-specific objectives within the proposed MUN de-designation boundary) is **not recommended** for the following reason:

1. Implementation would be inconsistent with the intent of the Basin Plan and *Sources of Drinking Water Policy* criteria for TDS levels in that groundwater TDS concentration exceed 3,000 mg/L (EC levels exceed 5,000 µS/cm) in the proposed MUN de-designation boundaries. Unlike MUN Alternative 3, SSOs do not address the primary question of what the appropriate MUN beneficial use protection is for the Project Area.

2. Since the MUN use does not exist in the area, but groundwater below a TDS concentration of 3,000 mg/L is present, SSOs would only be possible to support a "limited MUN" use, whereby waters would need to be treated or blended prior to use. A rational basis for a Limited-MUN SSO would be fragmented based on existing ambient water quality. This alternative would then be similar to MUN Alternative 1 (No Action), which allows only limited degradation of groundwater quality in defined zones. However, developing SSOs for another degree of use is not a reasonable alternative. As such, SSOs for the protection of the MUN beneficial use are eliminated from further consideration and specific environmental, antidegradation, or economic analyses are conducted on this alternative.

4.2 AGR Beneficial Use Alternatives, Evaluation and Staff Recommendation

The various project alternatives pertaining to the designation of the AGR beneficial use in groundwater in a portion of the Project Area are described below:

Alternative 1: No Action

Alternative 2: De-designate AGR beneficial use for all groundwater within Revised Project Area (no vertical boundaries) based on a groundwater quality salinity concentration threshold of 5,000 mg/L TDS.

Alternative 3: De-designate AGR within horizontally delineated portions of the Project Area, based on water quality within parts of the Revised Project Zone, based on a groundwater quality salinity concentration threshold limit of 5,000 mg/L TDS.

Alternative 4: Develop AGR site-specific salinity objectives within Project Area for irrigation and livestock watering supply.

General components of each of the AGR regulatory project alternatives are presented in this Staff Report.

Table 4-3. AGR Use Designation in Groundwater in the Project Area: Project Alternatives

Project Alternatives	Beneficial Use Designation Components	Water Quality Objective (WQO) Components	Implementation Program Components	Monitoring/ Surveillance (M/S) Components
Alternative 1: No Action	No Change in AGR Beneficial Use Designation	No New WQOs	No New Implementation Program	No New Monitoring and Surveillance Program
Alternative 2: De-designate AGR for all groundwater in Revised Project Area (no vertical limitations), based on TDS	Use technical and regulatory analyses to support de-designation of AGR beneficial use	AGR WQOs will no longer apply to groundwater within specific parts of the Project Area	Existing Regulatory Programs to Implement	Monitoring Utilizing Current Existing Regulatory Programs and Consider Expanding Monitoring Well Network to Fill Data Gaps
Alternative 3: De-designate AGR within delineated portions of the Revised Project Zone, based on TDS	Use technical and regulatory analyses to support de-designation of AGR beneficial use	AGR WQOs will no longer apply to groundwater within specific parts of the Project Zone where TDS is >5,000 mg/L	Existing Regulatory Programs to Implement	Monitoring Utilizing Current Existing Regulatory Programs and Consider Expanding Monitoring Well Network to Fill Data Gaps
Alternative 4: Develop AGR site-specific salinity objectives within Project Zone	No Change in AGR Beneficial Use Designation	Develop Individual Site-Specific Objectives (SSOs) that maintain existing concentrations	Existing Regulatory Programs to Implement	Adjust Existing Regulatory Programs to Account for New Objectives

4.2.1 AGR Alternative 1: No Action

AGR Alternative 1 would not amend the Basin Plan; rather it would continue to maintain the current AGR beneficial use designation for the Tulare Lake Basin. Accordingly, for areas that currently do not meet AGR-related WQOs, controllable factors, such as discharges from agriculture and produced wastewater disposal operations would not be allowed to further degrade existing water quality under the No Action Alternative.

However, the No Action Alternative would result in no change to current agricultural operations, and dischargers would still have to protect AGR beneficial use of groundwater within the Project Area. In addition, no new implementation provisions or monitoring and surveillance programs would be initiated.

4.2.2 AGR Alternative 2: De-Designation in Revised Project Area without Vertical Boundaries

AGR Alternative 2 would de-designate AGR as a beneficial use for all groundwater within the Project Area (i.e., with no vertical boundaries) based in part on an upper salinity threshold of 5,000 mg/L TDS for livestock watering (NRC, 1974) for pollution under the criteria for de-designation of the AGR beneficial use in the Basin Plan. The Project Area has both groundwater with salinity below and exceeding this threshold.

This alternative would de-designate the AGR beneficial use in the alluvium and underlying aquifers. A portion of the Project Area contains groundwater with TDS concentrations greater than 5,000 mg/L. However, the proposed Project Area would have to be reduced as it currently includes areas where TDS concentrations in groundwater are less than the 5,000 mg/L threshold. Thus, the currently proposed Project Area in its entirety is not eligible for AGR de-designation. Additionally, insufficient data is available from within the Project Area to fully characterize the vertical and lateral extent of water quality in aquifers underlying the alluvium.

4.2.3 AGR Alternative 3: De-Designation Only in the Revised Project Zone

AGR Alternative 3 is similar to AGR Alternative 2, except that AGR de-designation would be limited to the Revised Project Zone underlying the Revised Project Area. Within the evaluated Project Area, groundwater that exceeds the TDS threshold concentration of 5,000 mg/L TDS is contained within approximately 6 square miles. That TDS threshold meets the criterion for de-designation of the AGR beneficial use in the Basin Plan as polluted groundwater that does not support the AGR beneficial use. No changes will be made to groundwater (including shallow groundwater) outside the Revised Project Zone and that groundwater would retain the AGR designation. Maps showing the Revised Project Zone (alluvial groundwater meets 5,000 mg/L TDS threshold) are included in this Staff Report (Figure 2). Groundwater quality in the Revised Project Zone is currently poor, such that it meets or exceeds the proposed AGR threshold of 5,000 mg/L. In addition, landowners have not historically relied upon

the groundwater within the alluvium to support the AGR beneficial use, and do not expect the area to support the use in the foreseeable future. As a result of this alternative, dischargers will be relieved of the responsibility under the Basin Plan to protect AGR use in groundwater within the Revised Project Zone.

4.2.4 AGR Alternative 4: Site-Specific Objectives (SSOs) for Salinity for All Groundwater within the Project Zone

AGR Alternative 4 would involve changes to the Basin Plan pertaining to water quality objectives for groundwater in the Project Area. The development of SSOs for constituents of concern for the groundwater would be developed based on existing groundwater concentrations. Where groundwater quality (measured as TDS) currently does not support the AGR beneficial use, including for irrigation supply or the livestock watering, controllable factors, such as agriculture or disposal, would not be allowed to further degrade existing water quality under this alternative. Existing regulatory programs would be responsible for implementing the monitoring and surveillance program needed to assure that waste discharges do not further degrade existing groundwater quality in a site-specific area.

4.2.5 Evaluation of Project Alternatives

Similar to the process used to evaluate MUN alternatives, the above-described AGR Basin Plan Amendment alternatives were evaluated based on their ability to meet the following criteria:

1. Consistency with Applicable Federal and State Statutes and Regulations[10] for Protection of Water Quality
2. Applicability of Criteria in the Basin Plan for De-Designation of the AGR Beneficial Use
3. Protection of Existing and Future Potential Beneficial Uses
4. Maintains Agriculture Production in Project Area
5. Supports Salt Control/ Management
6. Technical Feasibility, Economic Viability, Reasonable Action
7. Existing Data

[10] Water Quality Control Plans and State Policy For Water Quality Control have the same legal effect as regulations. (See Gov. Code, § 11353; Wat. Code, §§ 13140 et seq., 13241 et seq.)

8. Support for Socioeconomic Wellbeing of Project Area

9. Ease of Implementation

Each AGR project alternative was evaluated with regard to how well it satisfies each criterion. As with the MUN Alternatives, this evaluation employs a scale of “low”, ‘medium”, and “high” in ranking extent to which each alternative meets a given criterion. Definitions of these rankings are provided in this Staff Report.

Table 4-4. AGR Designation in the Project Area: Evaluation of Project Alternatives

AGR Project Alternatives	Criterion 1: Consistent w/ Federal/State Laws	Criterion 2: Groundwater Meets Criteria for De-Designation Based on TDS Levels	Criterion 3: Protects Beneficial Uses	Criterion 4: Maintains Agriculture Production in Project Area	Criterion 5: Supports Salt Control/ Manage-ment	Criterion 6: Technical Feasibility, Economic Viability, Reasonable Action	Criterion 7: Existing Data	Criterion 8: Socio-economic Wellbeing	Criterion 9: Ease to implement
Alternative 1: No Action	High	Low	Low	High	Low	Low	Low	Low	High
Alternative 2: De-Designate AGR in Revised Project Area w/o Vertical Boundaries, based on TDS	Low	Low	Low	Low	Med	Med	Low	Med	Med
Alternative 3: De-Designate AGR within Parts of the Revised Project Zone, based on TDS in Project Zone	High	High	High	High	High	High	High	High	High
Alternative 4: Site-Specific Salinity Objectives in Project Area	High	Med	Med	Med	Med	Low	Low	Low	Low

4.2.6 Staff Recommendation: AGR Alternative 3

Based on the analysis of the four alternatives discussed above, Central Valley Water Board staff recommends AGR Alternative 3, which is to de-designate the AGR beneficial use from the Revised Project Area and Revised Project Zone based on the criterion for pollution in the Basin Plan where salinity exceeds the TDS concentration of 5,000 mg/L, as supported by the literature review prepared for CV-SALTS (CV-SALTS, 2013) and other literature (Ayers and Wescott, 1985). AGR Alternative 3 best satisfies the selection criteria since the action would:

1. Be consistent with both federal and state water quality laws and policies.

2. Be the appropriate protection for the groundwater in the Revised Project Zone proposed for AGR de-designation.

3. Ensure that all existing and future potential groundwater beneficial uses are protected.

4. Be the most beneficial and cost-effective measure because it does not require extensive scientific review and development of SSOs or additional costly measures to avoid groundwater quality degradation and/or meet salinity levels generally considered to support AGR beneficial uses: up to 5,000 mg/L TDS for irrigation and livestock watering.

Implementation of **AGR Alternative 1 (No Action)** would not satisfy the selection criteria because it would not lead to the improvement of salinity management within the Project Area and is not supported by existing scientific data and conditions. The Project Area does have groundwater quality that exceeds the TDS threshold concentration of 5,000 mg/L and those portions should be de-designated under the criteria in the Basin Plan. The implementation of AGR Alternative 1 could result in additional costly treatment measures that would be required to protect the AGR use for groundwater that is not currently and will never be suitable for this use.

Implementation of **AGR Alternative 2 (AGR de-designation without vertical limits)** would not satisfy the selection criteria because it would de-designate the AGR beneficial use where groundwater does not exceed the salinity threshold in all aquifers. The groundwater quality in portions of the Project Area features salinity levels both above and below a TDS concentration of 5,000 mg/L, therefore, not all of the groundwater within the proposed Project Area exceeds the 5,000 mg/L TDS salinity threshold, and AGR cannot be de-designated using these criteria. Because this alternative is viewed as limiting beneficial use protection in the Project Area, it is eliminated from further consideration and no specific environmental, antidegradation, or economic analyses are conducted for it.

Implementation of **AGR Alternative 4 (Site-Specific Objectives within the proposed de-designation boundaries for irrigation supply and livestock watering)** would not satisfy the selection criteria because it would also act to reduce agricultural production

in the Project Area, would not lead to the improvement of salinity management within the Project Area, and has the potential to cause socioeconomic impacts in the Project Area.

Unlike AGR Alternatives 2 and 3, SSOs do not address the primary question of what the appropriate AGR beneficial use protection is for the Project Area. SSOs would only be possible to support a “limited AGR” use, whereby some waters would need to be substantially treated or blended prior to use. A rational basis for a Limited-AGR SSO would be existing water quality. This alternative would then be similar to AGR Alternative1 (No Action), which allows limited degradation of groundwater quality. However, because the degree of AGR use of the groundwater contained in the proposed de-designation area is limited, developing SSOs for another degree of use is not a reasonable alternative. As such, SSOs for the protection of AGR beneficial uses are eliminated from further consideration and no environmental, antidegradation, or economic analyses are conducted on this alternative.

Implementation of SSOs for the protection of AGR beneficial uses would require dischargers to implement additional treatment and control of its discharge to reduce its impact on groundwater or would lead to reduced agricultural production in the area through land fallowing. Implementation of these measures may also produce unwarranted adverse socioeconomic impacts in the Revised Project Area.

Section 5: Program Implementation

Control and monitoring of this program has already been implemented through regulatory programs which are overseen by Central Valley Water Board staff, under which the Facilities operate. In addition, dischargers are required to demonstrate the integrity of the Facilities and perform maintenance activities.

Section 6: Consistency with Laws, Plan and Policies

The following state and federal laws, plans, and policies were reviewed for this Basin Plan Amendment.

6.1 Federal and State Laws

Federal agencies have adopted regulations implementing federal laws to which Central Valley Water Board actions must conform. The following federal laws were evaluated for this proposed Basin Plan Amendment:

- Clean Water Act
- Federal Endangered Species Act (16 U.S.C. § 15331 et seq.) and California Endangered Species Act (Fish & Game Code, § 2050 et seq.)

These laws and their relevance to the proposed Basin Plan Amendment are described in the following sections in addition to State law.

6.1.1 Federal Clean Water Act

Requirements for Avoiding Wetlands Loss

Under Clean Water Act section 404 and the Rivers and Harbors Act of 1899 Section 10, alteration of waterways, including wetlands that affect navigable water requires a permit from the federal government and assurance that impacts will be avoided or mitigated. The U.S. Army Corps of Engineers (USACE) operates the 404 permitting program with a goal of achieving a “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 Clean Water Act section 401, the State also reviews projects affecting water bodies. The State may require compensatory mitigation for wetlands impacts not under the jurisdiction of the federal government (e.g., for wetlands not contiguous with navigable waters).

The proposed Basin Plan Amendment will not adversely affect or have net loss to current wetlands. Therefore, these laws and regulations pertaining to wetland loss are not applicable to the proposed Basin Plan Amendment.

6.1.2 Federal and State Endangered Species Acts

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 & Game Code, § 2050 et seq.), which is administered by the California Department of Fish and Wildlife (CDFW) and similarly maintains State lists of rare, threatened and endangered species.

The proposed Basin Plan Amendment is not expected to affect fish and wildlife as it only de-designates MUN and AGR beneficial uses in groundwater. Therefore, the Endangered Species Act is not applicable to the proposed Basin Plan Amendment.

6.1.3 Human Right to Water (Wat. Code, § 106.3)

Water Code section 106.3 outlines the State of California policy that every human being shall have the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes. The statute provides as follows:

> (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 Water 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 those obligations that may exist pursuant to subdivision (b).
>
> (d) This section shall not apply to water supplies for new development.
>
> (d) The implementation of this section shall not infringe on the rights or responsibilities of any public water system.

As explained in this Staff Report, the Revised Project Zone does not contain groundwater that is suitable for municipal and domestic beneficial uses, including the specific applications outlined in Water Code section 106.3 (i.e., consumption, cooking and sanitary purposes). The groundwater proposed for de-designation meets the criteria for salinity in the Basin Plan and the *Sources of Drinking Water Policy*. Accordingly, the proposed Basin Plan Amendment is consistent with California's Human Right to Water Policy established under Water Code section 106.3.

6.1.4 Assembly Bill 32 – California Global Warming Solutions Act (Health & Safety. Code, § 38500 et seq.)

The California Global Warming Solutions Act of 2006, Health & Safety Code section 38500 et seq., which is better known as "Assembly Bill 32" or "AB 32," establishes a comprehensive program to reduce greenhouse gas (GHG) emissions from all sources throughout California. The Water Boards are committed to the adoption and implementation of effective actions to mitigate GHG emissions and adaptation of our policies and programs to the environmental conditions resulting from climate change.

The proposed Basin Plan Amendment is not expected to affect climate change because its adoption is not anticipated to produce a measurable change in existing GHG emissions in the Revised Project Area. Therefore, the proposed Basin Plan Amendment is consistent with the California Global Warming Solutions Act.

6.2 State Water Board Polices

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. (Water Code § 13170.) The following are the State Water Board policies potentially relevant to the proposed Basin Plan Amendment:

- *Statement of Policy with Respect to Maintaining the High Quality of Water in California*, State Water Board Resolution 68-16 (*Antidegradation Policy*)

- *Sources of Drinking Water Policy*, State Water Board Resolution 88-63 (*Sources of Drinking Water Policy*)

6.2.1 *Statement of Policy with Respect to Maintaining High Quality of Water in California*, State Water Board Resolution 68-16 (*Antidegradation Policy*)

A Basin Plan Amendment must be consistent with the State Water Board's *Statement of Policy with Respect to Maintaining High Quality of Waters in California*, Resolution 68-16 (*Antidegradation Policy*), which is also incorporated as part of the Basin Plan itself.[11] Adopted in October 1968, the *Antidegradation Policy* effectively limits the Central Valley Water Board's discretion to authorize degradation of so-called "high quality waters," defined as those waters whose quality is sufficient to support

[11] Although there is also a *Federal Antidegradation Policy* (40 C.F.R. § 131.12), it does not apply to groundwater or non-jurisdictional surface waters (i.e., not subject to the Clean Water Act).

designated beneficial uses. Determinations as to “high quality” status are typically made on a constituent-by-constituent basis.

The *Antidegradation Policy* sets forth a “two-part process” for the Board to authorize degradation of high-quality waters:

a. 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.

b. 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 assume 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.”

As a threshold matter, this Basin Plan Amendment does not trigger the State Water Board’s *Antidegradation Polic*y, as it does not involve the degradation of “high quality waters.” The Revised Project Zone groundwater subject to potential de-designation has been demonstrated to be unsuitable for MUN and AGR beneficial uses. The groundwater in the Revised Project Zone is not currently known to be used for MUN or AGR beneficial uses, and is not anticipated to be used for MUN or AGR beneficial uses in the future. De-designation for MUN and AGR beneficial uses is also consistent with the criteria for de-designation for each respective beneficial use in the Basin Plan.

Accordingly, the proposed Basin Plan Amendment is consistent with the State Water Board’s *Antidegradation Policy.*

6.2.2 *Sources of Drinking Water Policy*, State Water Board Resolution 88-63

The State Water Board’s *Sources of Drinking Water Policy* has already been discussed at length. The *Sources of Drinking Water Policy* states that all groundwater is considered suitable for MUN unless it meets one of the enumerated criteria in the policy. The “Exception 1a” in the policy exempts those waters with TDS exceeding 3,000 mg/L (equivalent to 5,000 μS/cm EC). Because groundwater within the Revised

Project Zone indisputably meets the criterion of “Exception 1a,” MUN de-designation is consistent with the *Sources of Drinking Water Policy*.[12]

[12] The *Sources of Drinking Water Policy* pertains only to MUN beneficial use designations; it has no applicability to AGR beneficial uses.

Section 7: Environmental Review

7.1 Background and Proposed "Project"

Although it constitutes a "project" under the California Environmental Quality Act (CEQA), Public Resources Code section 21000 et seq., this Basin Plan Amendment is a "certified regulatory program" that has been categorically exempted from the requirement for preparation of an Environmental Impact Report (EIR). (Pub. Resources Code, § 21080.5; Cal. Code Regs., tit. 14, 1251, subd. (g).) Basin Plan Amendments must instead comply with the procedural requirements set forth in California Code of Regulations, title 23, section 3775 et seq. This Staff Report and its associated Environmental Checklist constitute the Substitute Environmental Document (SED) that is required per California Code of Regulations, title 23, sections 3777 and 3779.5.

Although other alternatives were evaluated, the Central Valley Water Board's environmental review in this Section is limited to the Staff-recommended alternatives: **MUN Alternative 3** and **AGR Alternative 3**. Together, these alternatives would de--designate MUN and AGR as beneficial uses of groundwater within portions of the Project Zone, as identified above; the area proposed for de-designation is referred to in two-dimensional terms as the "Revised Project Area" (horizontal delineation) and in three-dimensional terms as the "Revised Project Zone".

7.2 Project Setting/Baseline

The baseline against which the proposed Basin Plan Amendment (Project) is assessed includes the following characteristics:

- Existing groundwater characteristics, hydrology, and uses of groundwater
- Existing agricultural operations
- Existing regulatory programs and policies

The primary discharge to groundwater in the Revised Project Zone comes from disposal of produced wastewater directly into sediments that overly the Revised Project Area. The area receives little precipitation, with the nearby unincorporated community of Buttonwillow averaging 6.4 inches per year,[13] which is substantially less than the statewide annual average rainfall (22.9 inches[14]). The salinity of groundwater within the majority of the Revised Project Zone exceeds a TDS concentration of 5,000 mg/L.

[13] https://www.usclimatedata.com/climate/buttonwillow/california/united-states/usca0146 accessed 9 October 2023.

[14] https://oehha.ca.gov/epic/changes-climate/precipitation accessed 9 October 2023.

Within the Revised Project Area, there are no entities known to be using the groundwater for MUN or AGR uses.

Existing regulatory programs and policies regulate the current produced water disposal and agricultural and storm water discharges and groundwater quality within and outside of the Revised Project Area. These programs and policies include, but are not limited to, CalGEM's Underground Injection Control (UIC) Regulatory Program, the Irrigated Lands Regulatory Program (ILRP), which is intended to ensure that agricultural discharges do not adversely affect beneficial uses, Waste Discharge Requirements (for both Title 27 Landfills and Oil Field discharges to land), Department of Toxic Substance Control (**DTSC**) regulatory oversight of Hazardous Waste Facilities, Phase II Small Municipal Separate Storm Sewer Systems (MS4s), Storm Water General Permit programs for construction and industrial activities, Water Quality Certification program for dredge and fill activities, and the State Water Board's *Sources of Drinking Water Policy* and *Antidegradation Policy*.

7.3 Environmental Impact Analysis (No Significant Effects)

As a SED, this Staff Report must contain "[a]n identification of any significant or potentially significant adverse environmental impacts of the proposed [Basin Plan Amendment]," as well as an analysis of any impacts associated with reasonably foreseeable methods of compliance with the amendment. (See Cal. Code Regs., tit. 23, § 3777, subds. (b)(2), (4).)

7.3.1 Project-Specific Impacts

The proposed Basin Plan Amendment would remove the MUN and AGR beneficial use designation in the groundwater within the horizontally and vertically delineated portion of the Revised Project Zone. MUN use is not an existing use for the groundwater and cannot feasibly be attained due to the high salinity of the groundwater within the Revised Project Zone. Similarly, the AGR use, which includes applications for irrigation supply and livestock watering, is limited.

The Proposed Basin Plan Amendment is based on the criteria for de-designation for the MUN and AGR beneficial uses in the Basin Plan. The proposed Basin Plan Amendment would not require additional implementation actions by dischargers to the groundwater within the Revised Project Area to meet MUN or AGR-related WQOs.

The proposed Basin Plan Amendment simply recognizes that MUN and AGR are not existing or attainable uses within the Revised Project Zone, formally applies the criteria identified in the Basin Plan with regard to the MUN and AGR beneficial uses, and enables the Central Valley Water Board to regulate discharges and irrigated agriculture within the proposed de-designation boundary and make impairment assessments based on appropriate beneficial use designations, consistent with state and federal policies. The Basin Plan Amendment does not affect groundwater outside of the Revised Project Zone, so those beneficial uses would continue to be protected, including from discharges within the Revised Project Zone that migrate outside of the Revised Project

Zone. The proposed Basin Plan Amendment would not cause any potentially significant environmental impacts and, therefore, there are no mitigation measures or alternatives that could reduce or avoid significant impacts. These conclusions are reflected in the Environmental Checklist provided.

7.3.2 Foreseeable Means of Compliance

A SED must include a "[a]n environmental analysis of the reasonably foreseeable methods of compliance…," which includes the following:

(A) An identification of the reasonably foreseeable methods of compliance with the project;

(B) An analysis of any reasonably foreseeable significant adverse environmental impacts associated with those methods of compliance;

(C) An analysis of reasonably foreseeable alternative methods of compliance that would have less significant adverse environmental impacts; and

(D) An analysis of reasonably foreseeable mitigation measures that would minimize any unavoidable significant adverse environmental impacts of the reasonably foreseeable methods of compliance.

(Cal. Code Regs., tit. 23, § 3777, subd. (b)(4).)

This environmental analysis must "take into account a reasonable range of environmental, economic, and technical factors, population and geographic areas, and specific sites," though the Central Valley Water Board is not required to engage in a "a site-specific project level analysis of the methods of compliance, which CEQA may otherwise require of those agencies who are responsible for complying with the plan or policy when they determine the manner in which they will comply."[15] (*Id*., § 3777, subd. (c); cf. Pub. Resources Code, § 21159, subds. (c)-(d).)

In this instance, the proposed Basin Plan Amendment merely involves a de-designation of MUN and AGR beneficial uses within the three-dimensional Revised Project Zone, thereby removing the need for compliance with WQOs associated with such beneficial uses inside of the Revised Project Zone. Accordingly, no further analysis of means of compliance is required at this time.

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[15] A similar analysis is also required when the Central Valley Water Board adopts a regulation (i.e., Basin Plan Amendment) requiring installation of pollution control equipment, or a performance standard or treatment requirement. (Pub. Resources Code, §§ 21159(a), 21159.4(a)(4).)

7.3.3 Cumulative Impacts

"Cumulative impacts" are defined as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts." (Cal. Code Regs., tit. 14, § 15355.) These effects may be changes resulting from a single project, or multiple separate projects. (*Id*., § 15355, subd. (a).)

With respect to analyzing the cumulative impacts from multiple projects, the CEQA Guidelines further advise as follows:

> The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.

(*Id*., § 15355, subd. (b).)

In this context, reasonably foreseeable future projects include the Board's revision of waste discharge requirements for regulated entities that discharge within the Revised Project Area. These revisions would still require compliance with WQOs in the groundwater within the areas outside of the Revised Project Zone (including those underlying the Project Area). Any future projects that may involve disposal of produced wastewater outside of the Revised Project Area and Revised Project Zone, would still need to comply with criteria developed to protect MUN and AGR beneficial uses. In addition, projects with the Revised Project Area would still need to comply with permitting requirements. Central Valley Water Board staff anticipate that the regulated entities whose permits may be revised by the Board subsequent to the adoption of the proposed Basin Plan Amendment may include agricultural, disposal site operators, dischargers of oil field produced wastewater, and oil and gas operators.

Lastly, this basin planning effort is one part of a region-wide effort that the Board is undertaking to evaluate the appropriate beneficial use protection, WQOs, and implementation and monitoring requirements for the MUN beneficial use in various water bodies throughout the Central Valley. It is possible that other ground waters in the Central Valley may have their MUN beneficial use removed in the future if they meet one or more of the exception criteria in the *Sources of Drinking Water*. Similarly, other ground waters in the Central Valley also may have their AGR beneficial use removed in the future if it is demonstrated that existing ambient salinity levels are causing pollution and do not support the use of the water for irrigated agriculture and livestock watering, and no such current use of the water is found to exist.

Based on the foregoing, the Central Valley Water Board has determined that there exists no "fair argument" that either the proposed Basin Plan Amendment, or the reasonably foreseeable methods of compliance therewith, will result in any significant environmental impacts, either individually or cumulatively.

7.4 Alternative Analysis (Not Required)

Ordinarily, a SED must contain "[a]n analysis of reasonable alternatives to the project and mitigation measures to avoid or reduce any significant or potentially significant adverse environmental impacts." (Cal. Code Regs., tit. 23, § 3777, subd. (b)(3).) However, where the Central Valley Water Board has determined that there exists no "fair argument" that the Basin Plan Amendment may result in any reasonably foreseeable significant adverse environmental impacts, the SED (i.e., this Staff Report) need only include a finding to that effect. (*Id*., § 3777, subd. (e).)

Section 8: Economic Analysis (Not Required)

For the purposes of this Section, the Basin Plan Amendment (Project) shall be strictly limited to the Staff-recommended alternatives: **MUN Alternative 3** (§ 4.1.3) and **AGR Alternative 3** (§ 4.2.3). Together, these alternatives would de-designate MUN and AGR as beneficial uses of groundwater within the Revised Project Zone which underlies the Revised Project Area, as identified in this Staff Report.

There are three conditions under which economic considerations must be considered in the context of a Basin Plan Amendment. None of these conditions are present in the Project.

First, WQOs established under the Basin Plan must account for economic considerations. (Wat. Code, § 13241, subd. (d).) Because the Project will not involve the establishment or modification of WQOs, this requirement does not apply.[16]

Second, prior to the Central Valley Water Board's implementation of an agricultural water quality control program, the Basin Plan must include "an estimate of the total cost of such a program, together with an identification of potential sources of financing…." (Wat. Code, § 13141.) This requirement is also inapplicable because: (1) the proposed Project does not involve the implementation of an agricultural water quality control program; (2) such a program already exists in the form of the ILRP; and (3) the Board has already complied with this statutory mandate in connection with the ILRP. (See Basin Plan, § 4.1.2, pp. 4-2, 4-3.)

Third, economic considerations must be taken into account by the SED when analyzing impacts of reasonably foreseeable means of compliance with a new requirement or obligation imposed under the Basin Plan. (See Cal. Code Regs., tit. 23, § 3777, subds. (b)(4), (c).) The de-designation of beneficial uses obviates any obligation to comply with WQOs associated with such uses in the Revised Project Zone. In other words, the Project does not result in any new means of compliance. No further economic analysis is required at this time.

[16] MUN Alternative 4 and AGR Alternative 4, both of which would involve the establishment of site-specific WQOs (i.e., Site-Specific Objectives or SSOs), are eliminated from consideration.

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FIGURES

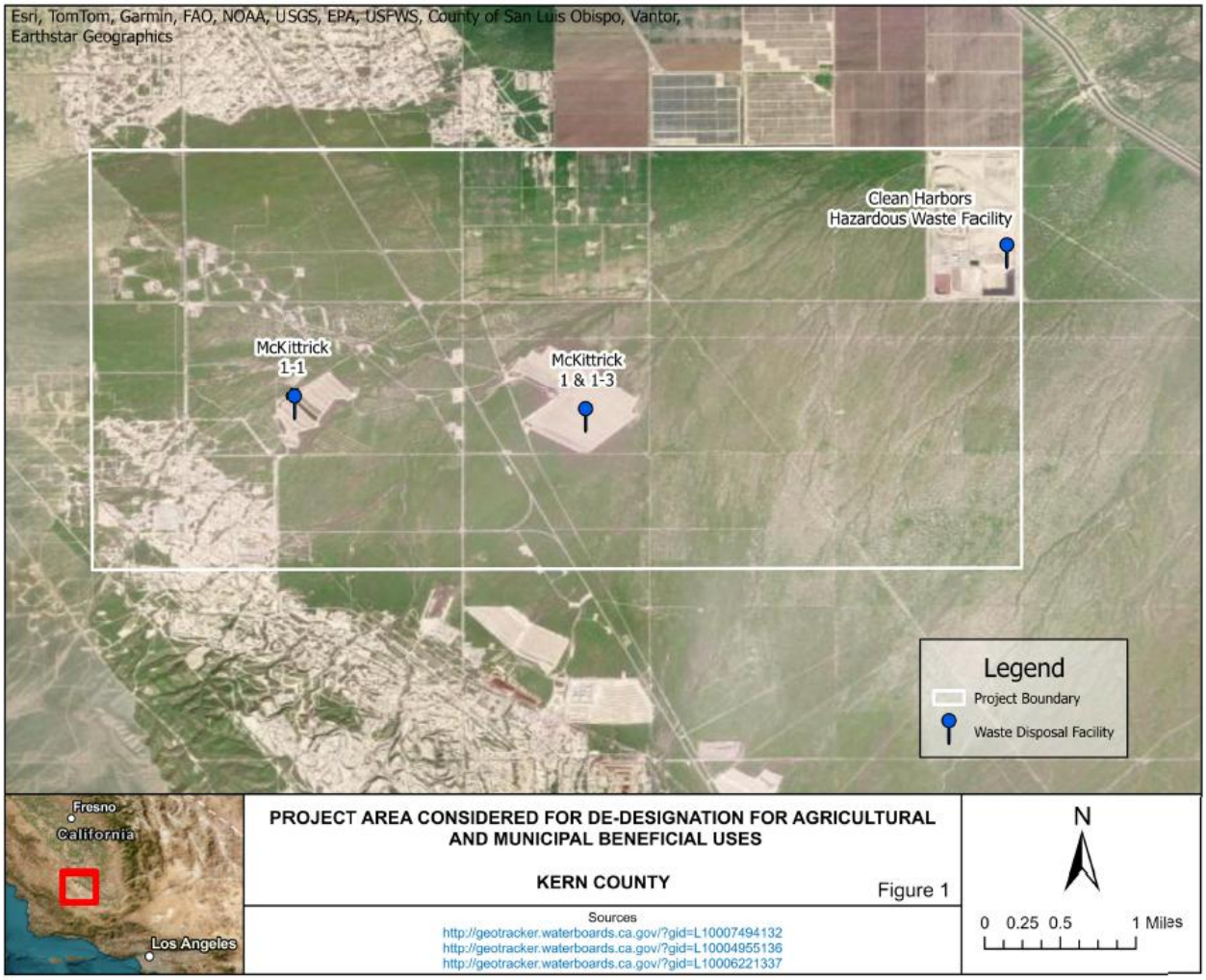

Figure 1. The whole Project Area considered for beneficial use de-designation (white box), and waste disposal facilities within the Project Area.

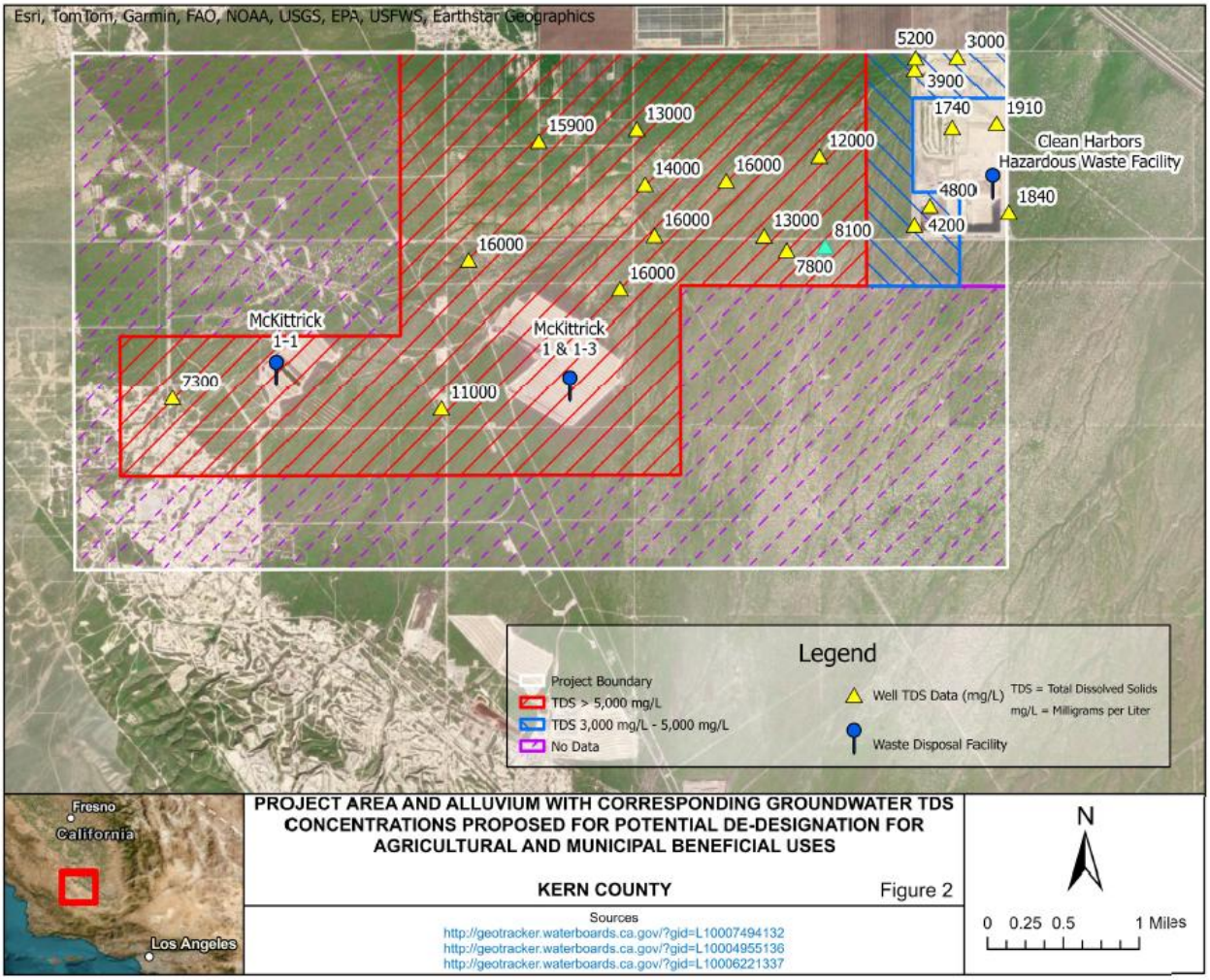

Figure 2. Project Area showing the whole area considered for de-designation (white box), area where alluvium groundwater exceeds 5,000 mg/L TDS (red box – Revised Project Area proposed for de-designation for both MUN and AGR beneficial uses), area where alluvium groundwater is between 3,000 and 5,000 mg/L (blue box – Revised Project Area proposed for de-designation of only MUN beneficial use), and area where there is no data for groundwater in the alluvium (purple box).

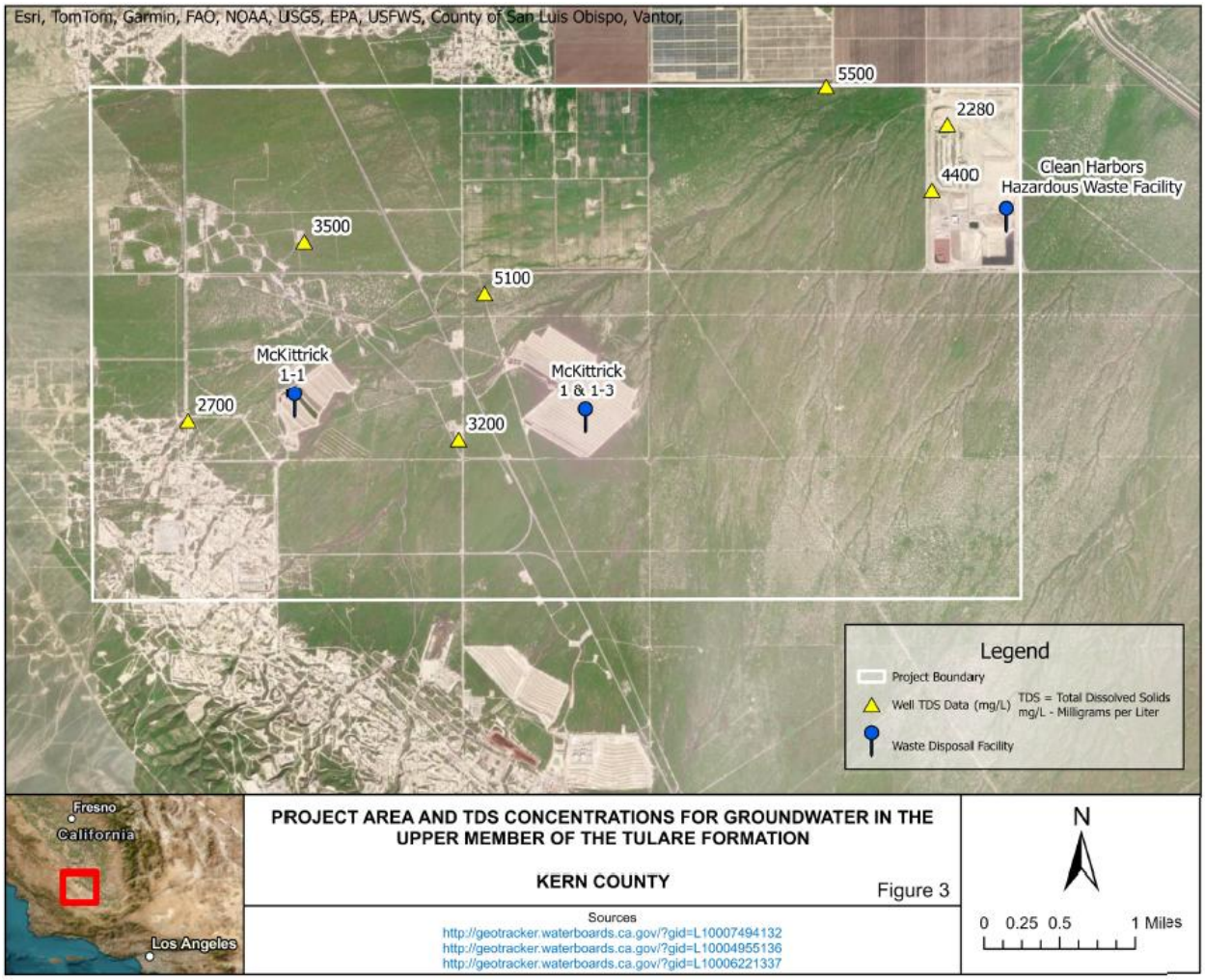

Figure 3. TDS concentrations in groundwater in the Tulare Formation.

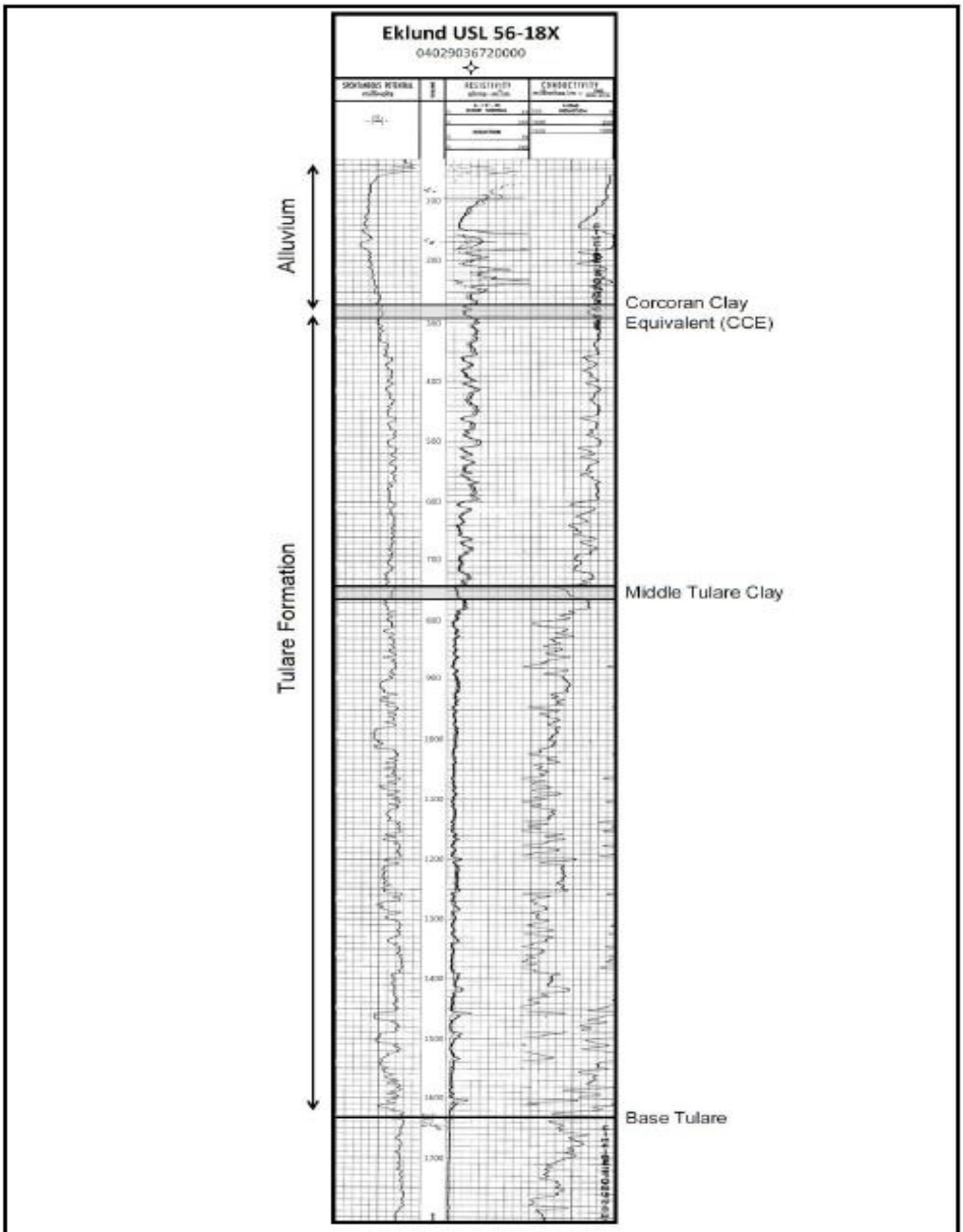

Figure 4. Type Log of the Tulare Formation within the Project Area.

APPENDICES

Appendix A Project Area Surface Landowners

Landowners
Abbott Richard Revocable Trust
Aera Energy LLC
Alma Investing Co.
Berry Petroleum Co.
Chevron U.S.A. Inc.
Clean Harbors Buttonwillow LLC
Felker Patricia A Trust
Sentinel Peak Resources Cal LLC
Starrh & Starrh Cotton Growers LP
Valley Water Management Company
Vaquero SJV LLC
Ware Family Partners L P

Appendix B

MUN Project Alternatives Ranking Assumptions and Rationale

Project Alternatives	Beneficial Use Designation Components	Water Quality Objective (WQO) Components	Implementation Program Components	Monitoring/ Surveillance (M/S) Components
Alternative 1: No Action	No Change in MUN Beneficial Use Designation	No New WQOs	No New Implementation Program	No New Monitoring and Surveillance Program
Alternative 2: De-designate MUN beneficial use for all groundwater in Revised Project Area (no vertical boundaries) based on TDS	Use technical and regulatory analyses to support de-designation of MUN beneficial use	MUN WQOs will no longer apply to groundwater within a specific area of the Revised Project Area	Existing Regulatory Programs to Implement	Monitoring Utilizing Current Existing Regulatory Programs and Consider Expanding the Current Monitoring Well Network to Fill Data Gaps
Alternative 3: De-designate MUN within Distinct Portions of the Revised Project Zone based on TDS	Use the salinity criterion in the Basin Plan based on existing groundwater quality and supporting evidence to de-designate MUN beneficial use	MUN WQOs no longer apply to groundwater in specific zones having groundwater salinity concentration levels greater than 3,000 mg/L TDS (EC of 5,000 µS/cm) as defined by proposed boundaries identified in this Staff Report	Existing Regulatory Programs to Implement	Monitoring Utilizing Current Existing Regulatory Programs and Consider Expanding the Current Monitoring Well Network to Fill Data Gaps

Project Alternatives	Beneficial Use Designation Components	Water Quality Objective (WQO) Components	Implementation Program Components	Monitoring/ Surveillance (M/S) Components
Alternative 4: Development of MUN Site-Specific Salinity Objectives in Project Zone	Re-designate Beneficial Use as Limited-MUN	Develop Individual Site-Specific Objectives (SSOs) that maintain existing concentrations	Existing Regulatory Programs to Implement	Adjust Existing Regulatory Programs to Account for New Objectives

MUN Consideration, Evaluation of Project Alternatives

MUN Project Alternatives	Criterion 1: Consistent w/ Federal/ State Laws	Criterion 2: Groundwater Meets Criteria for De-Designation Based on TDS Levels	Criterion 3: Protects Beneficial Uses	Criterion 4: Technical Feasibility, Economic Viability, Reasonable Action	Criterion 5: Existing Data	Criterion 6: Socio-economic Wellbeing	Criterion 7: Ease to Implement
Alternative 1: No Action	High	Low	High	Low	Low	Low	High
Alternative 2: De-Designate MUN in Revised Project Area w/o Vertical Boundaries, based on TDS	Low	Low	Low	Med	Low	Med	Med

MUN Project Alternatives	Criterion 1: Consistent w/ Federal/ State Laws	Criterion 2: Groundwater Meets Criteria for De-Designation Based on TDS Levels	Criterion 3: Protects Beneficial Uses	Criterion 4: Technical Feasibility, Economic Viability, Reasonable Action	Criterion 5: Existing Data	Criterion 6: Socio-economic Wellbeing	Criterion 7: Ease to Implement
Alternative 3: De-Designate MUN within Parts of Revised Project Zone, based on TDS	High	High	High	High	High	High	High
Alternative 4: Site-Specific Salinity Objectives in the Project Zone	High	Low	High	Low	Low	Low	Low

Appendix C AGR Project Alternatives Ranking Assumptions and Rationale

Project Alternatives	Beneficial Use Designation Components	Water Quality Objective (WQO) Components	Implementation Program Components	Monitoring/ Surveillance (M/S) Components
Alternative 1: No Action	No Change in AGR Beneficial Use Designation	No New WQOs	No New Implementation Program	No New Monitoring and Surveillance Program
Alternative 2: De-designate AGR for all groundwater in Revised Project Area (no vertical limitations), based on TDS	Use technical and regulatory analyses to support de-designation of AGR beneficial use	AGR WQOs will no longer apply to groundwater within specific parts of the Project Area	Existing Regulatory Programs to Implement	Monitoring Utilizing Current Existing Regulatory Programs and Consider Expanding Monitoring Well Network to Fill Data Gaps
Alternative 3: De-designate AGR within delineated portions of the Revised Project Zone, based on TDS	Use technical and regulatory analyses to support de-designation of AGR beneficial use	AGR WQOs will no longer apply to groundwater within specific parts of the Project Zone where TDS is >5,000 mg/L	Existing Regulatory Programs to Implement	Monitoring Utilizing Current Existing Regulatory Programs and Consider Expanding Monitoring Well Network to Fill Data Gaps
Alternative 4: Develop AGR site-specific salinity objectives within Project Zone	No Change in AGR Beneficial Use Designation	Develop Individual Site-Specific Objectives (SSOs) that maintain existing concentrations	Existing Regulatory Programs to Implement	Adjust Existing Regulatory Programs to Account for New Objectives

AGR Designation in the Project Area: Evaluation of Project Alternatives

AGR Project Alternatives	Criterion 1: Consistent w/ Federal/ State Laws	Criterion 2: Groundwater Meets Criteria for De-Designation Based on TDS Levels	Criterion 3: Protects Beneficial Uses	Criterion 4: Maintains Agriculture Production in Project Area	Criterion 5: Supports Salt Control/ Manage-ment	Criterion 6: Technical Feasibility, Economic Viability, Reasonable Action	Criterion 7: Existing Data	Criterion 8: Socio-economic Wellbeing	Criterion 9: Ease to implement
Alternative 1: No Action	High	Low	Low	High	Low	Low	Low	Low	High
Alternative 2: De-Designate AGR in Revised Project Area w/o Vertical Boundaries, based on TDS	Low	Low	Low	Low	Med	Med	Low	Med	Med
Alternative 3: De-Designate AGR within Parts of the Revised Project Zone, based on TDS in Project Zone	High	High	High	High	High	High	High	High	High
Alternative 4: Site-Specific Salinity Objectives in Project Area	High	Low	Med	Med	Med	Low	Low	Low	Low

Appendix D Environmental Checklist

Appendix E Response to External Peer Review Comments