

Evaluation of the Municipal and Domestic Supply (MUN) and Agricultural Supply (AGR) Beneficial Uses in Groundwater Contained in a Portion of the Historical Tulare Lakebed

Public Workshop and CEQA Scoping Meeting

INFORMATION DOCUMENT

INTRODUCTION: In order to ensure appropriate beneficial use protection, the Central Valley Regional Water Quality Control Board (Central Valley Water Board or Board), in conjunction with the Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) initiative, is considering developing an amendment to the Water Quality Control Plan for the Tulare Lake Basin (Tulare Lake Basin Plan) related to the current MUN and AGR designations for a portion of the groundwater basin in the historical Tulare Lakebed. The historical Tulare Lakebed was fed by the Kings, Kaweah, and Tule Rivers prior to the construction of dams and is identified in Figure II-1 (http://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/tlb_figII-2.pdf) of the Tulare Lake Basin Plan.

Staff from the Central Valley Water Board will hold a Public Workshop and California Environmental Quality Act (CEQA) scoping meeting to discuss and solicit comments and suggestions from the public regarding potential alternatives that may become amendments to the Tulare Lake Basin Plan, the means by which regulated entities might comply with any of the alternatives, the significant and cumulative impacts that could result from new implementation provisions, and potential mitigation measures to limit these impacts. As part of the CV-SALTS initiative, the Board is in a multi-year process under which it is evaluating the beneficial uses assigned to surface and groundwaters by the Board's Basin Plans. As a part of that process, the Board is:

- Evaluating whether a portion of the groundwater in the historical Tulare Lakebed (within the South Valley Floor hydrologic unit 558.30, Figure II-1 of the Tulare Lake Basin Plan) supports the Municipal and Domestic Supply (MUN) beneficial use, and if not, whether it may be eligible for de-designation consistent with the State Water Resources Control Board Resolution No. 88-63 (*Sources of Drinking Water Policy*).
- Considering the de-designation of the MUN and Agricultural Supply (AGR) beneficial uses in portions of the Tulare Lakebed where those beneficial uses have not been historically supported and/or where those beneficial uses are not currently supported.
- Considering the adoption of site-specific objectives or the development of subcategories of the AGR beneficial use where groundwater has not supported and/or does not currently support a full range of AGR beneficial uses (these uses range from irrigating salt-sensitive crops through stock watering).
- Considering amending the Tulare Lake Basin Plan to incorporate a framework for evaluating the applicability of the MUN and AGR beneficial uses and associated water quality objectives, including implementation provisions, that would apply in specific groundwater basins.

The Central Valley Water Board recognized the need to evaluate existing beneficial use designations during the March 2010 Tulare Lake Basin Triennial Review. The CV-SALTS

initiative also identified the need to evaluate these use designations as part of the development of solutions to the salt problem in the Central Valley Region. The Tulare Lake Basin Plan may currently designate portions of the groundwater as supporting beneficial uses that have not been historically supported and/or are not currently supported.

Beneficial uses, as well as the associated water quality objectives that provide reasonable protection of those uses, may be altered by amending the Basin Plan, provided that such amendments are consistent with the policies set forth in Water Code section 13000 et seq. and any other state policy for water quality control. The Tulare Lake Drainage District (TLDD), in coordination with CV-SALTS, has provided funding for a registered professional geologist to collect data and characterize groundwater in a portion of the historical Tulare Lakebed. This data collection and characterization effort, which will be discussed at the workshop and is described below, may provide valuable information in support of future basin planning efforts.

As a member of CV-SALTS, TLDD initially provided a study proposal for the removal of MUN from a portion of the groundwater basin in the historical Tulare Lakebed. The CV-SALTS Executive Committee agreed that pursuing de-designation of MUN from a portion of the Tulare Lakebed may serve as an appropriate archetype or template for studies for future efforts to evaluate the appropriateness of the MUN beneficial use designation in other groundwater basins. Subsequently, TLDD amended its study proposal to also evaluate the removal of the AGR beneficial use from a portion of the groundwater basin in the historical Tulare Lakebed.

A proposed Basin Plan amendment considered by the Board may include: 1) a methodology for characterizing the lateral and vertical extent of a groundwater basin to be evaluated for the applicability of MUN and AGR; 2) proposed refinements (such as subcategories) of the MUN and AGR beneficial uses; 3) site-specific or beneficial use-specific water quality objectives that are protective of the identified MUN and AGR beneficial uses; 4) a program of implementation for achieving water quality objectives; and/or 5) a monitoring program to evaluate protection of the applicable beneficial uses and effectiveness of the implementation efforts.

The Central Valley Water Board is required by CEQA to conduct an environmental analysis of a proposed Basin Plan amendment. (Pub. Resources Code, § 21000 et seq.) The purpose of the public workshop and CEQA scoping meeting is to solicit public input regarding the scope of a proposed amendment along with its potential significant environmental impacts, mitigation measures, and possible alternatives. Public comments will help the Central Valley Water Board and CV-SALTS to refine the scope of its environmental analysis. The Central Valley Water Board will not amend the Basin Plan without first circulating its environmental analysis for further public comment.

The MUN and AGR beneficial use evaluation is the initial phase of a larger effort to develop a template for addressing areas in the Central Valley Water Board's Water Quality Control Plans for the Sacramento River and San Joaquin River Basins, and Tulare Lake Basin Plans (Basin Plans) where beneficial uses should be evaluated based on application of the criteria in the *Sources of Drinking Water Policy* and water quality objectives for the protection of agricultural uses. The work has been identified as an essential activity of CV-SALTS, a collaborative effort initiated in 2006 to find solutions to the salt and nitrate problems in the Central Valley. Participants of CV-SALTS are working together to develop a functional, comprehensive plan to address salinity, including nitrates, throughout the region in a consistent and sustainable manner. The Executive Committee of CV-SALTS is developing policies to support the

preparation of a Salt and Nutrient Management Plan (SNMP) for the Central Valley. This effort includes evaluating appropriate use designations and level of protection for water bodies currently designated with MUN and AGR beneficial uses. Through the completion of technical studies and basin planning documentation on specific projects, an opportunity to establish reference archetypes for making subsequent MUN and AGR determinations on other water bodies in the future will be provided.

BACKGROUND: The Central Valley Region is comprised of three major basins: the Sacramento River, San Joaquin River, and Tulare Lake Basins, as well as the Sacramento-San Joaquin Delta. Two Water Quality Control Plans (Basin Plans) cover the area: the Sacramento River and San Joaquin River Basin Plan, which includes the Sacramento-San Joaquin Delta, and the Tulare Lake Basin Plan. In its entirety, the Central Valley Region covers 60,000 square miles, or 40 percent of the state, and includes nearly 80 percent (over 7 million acres) of the state's irrigated agricultural land.

The Central Valley Water Board incorporated the *Sources of Drinking Water Policy* into both the Sacramento River/San Joaquin River and Tulare Lake Basin Plans by designating all water bodies as supporting the MUN beneficial use. The only waterbodies where the MUN beneficial use does not apply are those water bodies specifically listed in the Basin Plan as not supporting this use. Furthermore, the Basin Plans state, "[u]nless otherwise designated by the Regional Water Board, all ground waters in the Region are considered as suitable or potentially suitable, at a minimum, for municipal and domestic water supply (MUN), agricultural supply (AGR), industrial service supply (IND), and industrial process supply (PRO)." While the *Sources of Drinking Water Policy* contains a list of exceptions whereby the Regional Boards could determine that the MUN beneficial use does not apply in certain waterbodies, de-designating a waterbody for any beneficial use still requires the Board to amend the Basin Plan.

The Basin Plans also state that waters designated as supporting the MUN beneficial use must not exceed Maximum Contaminant Levels (MCLs) of Title 22 of the California Code of Regulations for chemical constituents, pesticides, and radionuclides. With regard to water quality objectives specified in the Tulare Lake Basin Plan for the protection of groundwater beneficial uses, salinity is regulated through the implementation of the following narrative objective: "All ground waters shall be maintained as close to natural concentrations of dissolved matter as is reasonable considering careful use and management of water resources." Individual hydrographic units in the Tulare Lake Basin are also limited to a maximum average annual increase in electrical conductivity (EC), but they are not regulated according to a specific salinity objective for the protection of the AGR beneficial use.

As noted above, the Central Valley Water Board recognized the need for evaluating appropriate MUN and other beneficial uses during its March 2010 Tulare Lake Basin Triennial Review. The approved triennial review work plan noted the State Water Board determined in Order WQO 2002-0015, "... where the Central Valley Water Board has evidence that a use neither exists nor likely can be feasibly attained, the Central Valley Water Board must expeditiously initiate appropriate basin plan amendments to consider de-designating the use. Moreover, the Central Valley Water Board can require dischargers to the affected water body to provide assistance, through data collection, water quality-related investigations, or other appropriate means, to support and expedite the basin plan amendment process." In addition to providing funding for a registered professional geologist to collect data to define the boundary of the study area and characterize the groundwater within that boundary, TLDD, in coordination with CV-SALTS, has

employed local resources and worked with the local community to evaluate well locations and uses as they pertain to drinking water, agricultural irrigation and stock watering practices.

REGULATORY CONTEXT: The State Water Board and the nine Regional Water Quality Control Boards (Regional Water Boards) are the state agencies with primary responsibility for coordination and control of water quality. (Wat. Code, § 13000.) Each Regional Water Board is required to adopt a water quality control plan, or basin plan, which provides the basis for regulatory actions to protect water quality. (Wat. Code, § 13240 et seq.) Basin plans designate beneficial uses of water, water quality objectives to protect the uses, a program of implementation to achieve the objectives, and a monitoring program to ensure the goals of the program are met. (Wat. Code, § 13050, subd. (j).) Basin Plans, once adopted, must be periodically reviewed¹ and may be revised.

State Policies that directly apply to this effort include:

- The *Sources of Drinking Water Policy*: establishes state policy that all waters are considered suitable or potentially suitable to support the MUN beneficial use, with certain exceptions. The Central Valley Water Board incorporated the *Sources of Drinking Water Policy* into its Basin Plans by designating all water bodies as supporting the MUN beneficial use; the only waterbodies where the MUN beneficial use does not apply are those water bodies where that use has been specifically identified in the Basin Plans as not having the MUN use.

Exceptions to the MUN designation are allowed under the *Sources of Drinking Water Policy* for surface and ground waters: 1) with total dissolved solids (TDS) exceeding 3,000 mg/L (5,000 µmhos/cm EC) and where the waters are not reasonably expected by Regional Water Boards to supply a public water system; 2) with contamination, either by natural processes or by human activity, that cannot reasonably be treated for domestic use using either Best Management Practices or best economically achievable treatment practices; 3) where there is not sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day; 4) for surface waters in systems designed for wastewater collection or conveying or holding agricultural drainage, provided that the discharge from such systems is monitored to assure compliance with all relevant water quality objectives; or 5) in groundwater regulated as a geothermal energy producing source. Exceptions 1) and 2) listed above are typically referred to as *Exception Criterion 1a* and *Exception Criterion 1b*, respectively. The *Sources of Drinking Water Policy* addresses only the designation of water as suitable, or potentially suitable for municipal or domestic supply. The *Sources of Drinking Water Policy* does not establish water quality objectives for constituents to protect MUN.

- State Water Resources Control Board Resolution 68-16 (*Statement of Policy with Respect to Maintaining High Quality of Waters in California*, referred to as the *State Anti-Degradation Policy*): generally prohibits the Central Valley Water Board from authorizing activities that will result in the degradation of high-quality waters unless it has been shown that: 1) the degradation will not result in water quality less than that prescribed in state and regional policies, including violation of one or more water quality objectives; 2) the degradation will

¹ Water Code section 13240 and Section 303 (c)(1) of the federal Clean Water Act (33 U.S.C. § 1313(c)(1).) require a review of basin plans at least once each three-year period to keep pace with changes in regulation, new technologies, policies, and physical changes within the region.

not unreasonably affect present and anticipated future beneficial uses; 3) the discharger will employ Best Practicable Treatment or Control (BPTC) to minimize degradation; and 4) the degradation is consistent with the maximum benefit to the people of the state.

Groundwater in portions of the historical Tulare Lakebed does not support an unrestricted range of AGR beneficial uses due to naturally-occurring geologic conditions that result in elevated levels of salinity constituents, including TDS. The AGR beneficial use included in the Basin Plans is defined as, “[u]ses of water for farming, horticulture, or ranching, including, but not limited to, irrigation (including leaching of salts), stock watering, or support of vegetation for grazing.” This broad definition distinguishes the AGR beneficial use from the MUN use. While limits protective of human health are relatively well-defined (such as the primary MCLs), water quality limits developed to protect AGR uses range from the very stringent standards necessary to protect the most salt-sensitive crops to the relatively relaxed standards necessary to protect livestock watering.

The Tulare Lake Basin Plan contains a list of exceptions whereby the Central Valley Water Board could determine that the MUN beneficial use does not apply in certain waterbodies, but de-designating the AGR beneficial use still requires that the Board amend the Basin Plan. These exceptions include waters: 1) with contamination, resulting either from natural processes or human activity, that cannot reasonably be treated for agricultural use using either Best Management Practices or best economically achievable treatment practices; 2) where there is not sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day; or 3) in aquifers regulated as a geothermal energy producing source. 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 threshold concentrations that are generally considered to be protective of irrigation and stock watering. Use of water for agricultural irrigation is severely limited at a TDS concentration greater than 2,000 mg/L (3,000 μ mhos/cm EC). This critical threshold for EC was derived from the work of Ayers and Westcot (1985) and recently has been reaffirmed by CV-SALTS (CV-SALTS, 2012). Use of water for stock watering is severely impacted when TDS levels exceed 5,000 mg/L (7,500 μ mhos/cm EC). This threshold is based on a National Academy of Sciences (NAS) report (NAS, 1974). CV-SALTS recently reaffirmed this threshold in its review of the literature (CV-SALTS, 2013; see Table 21).

When establishing water quality objectives, the Central Valley Water Board is required to consider all of the following: 1) past, present, and probable future beneficial uses of water; 2) environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto; 3) water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area; 4) economic considerations; 5) the need for developing housing within the region; and 6) the need to develop and use recycled water. (Wat. Code, § 13241.)

PROJECT AREA DESCRIPTION: The CV-SALTS case study to develop a possible template for reviewing MUN and AGR designations and levels of protection in Central Valley groundwater basins is currently centered on a portion of the historical Tulare Lakebed within the Tulare Lake Basin (see **Figure 1**). The historical Tulare Lakebed is a natural depression on the valley floor. Since development of the upstream diversions on the eastside of the San Joaquin Valley from the four major river tributaries (Kings, Kaweah, Tule, and Kern) and the U. S. Army Corps of

Engineers' flood control projects on the tributaries, the Tulare Lake Basin is a "closed basin" with no natural outflow.

Soil conditions of the west side of the southern San Joaquin Valley are derived from marine sedimentary deposits that comprise the Coast Ranges. The deposits are composed primarily of silts and clays. Within this area, the most predominant clay unit is commonly known as the Corcoran Clay, which extends throughout the majority of the western and southern Tulare Lake Basin. The Corcoran Clay generally separates unconfined groundwater conditions above the clay to confined conditions below the clay. The proposed project will focus on the unconfined (shallow) groundwater in the historical Tulare Lakebed.

The proposed project surface area is approximately 324,000 acres and covers a portion of the historical Tulare Lakebed. The area has alkaline heavy clay soils, extremes of climate, and threat of flood hazard due to the topography. The primary land use is commercial agricultural production of cotton, wheat, safflower, alfalfa hay, processing tomatoes, and other field crops. The lowest lying area of the historical Tulare Lakebed is utilized for evaporation ponds to manage and dispose of subsurface tile drainage waters that are received from TLDD landowners.

The proposed project area does not include any towns or communities; it is bounded to the north by Laurel Avenue (Kings County) and the community of Stratford, on the west by Highway 41 and Interstate 5 near Kettleman City. The eastern boundary is near Highway 43 with the City of Corcoran to the northeast and the community of Alpaugh to the southeast. These cities and communities use groundwater from the confined aquifer (below the Corcoran Clay) as a drinking water source, but the municipal supply wells are outside of the project area. There are no natural water bodies in the project area; all of the canals in the Lakebed are man-made. The Tule River transitions from an unchannelized water body to a constructed channel southeast of Corcoran and just west of Hwy 43. Because the closed basin is prone to periodic flooding, there are few residences and permanent plantings and no public supply wells located in the interior portion of the Tulare Lakebed.

POTENTIAL ALTERNATIVES: In preparation for the CEQA scoping meeting, potential alternatives have been identified to evaluate the MUN and AGR beneficial uses in the groundwater basin within the Tulare Lakebed study area. These alternatives will be presented as a starting point for discussion at the public CEQA scoping meeting and should not be presumed to be the only available alternatives.

Alternatives for CEQA Scoping – De-designation of MUN Beneficial Use

1. No Action.
2. De-designate MUN (based on Exception Criterion 1a of the Sources of Drinking Water Policy) within the horizontal boundary to the variable vertical depths represented in **Figure A**.
3. Establish MUN site-specific salinity objectives for the Tulare Lakebed area.
4. Establish refined horizontal/vertical boundaries (as currently shown **Figure A**) based on information developed during the CEQA scoping process.

Alternatives for CEQA Scoping – De-designation of AGR Beneficial Use

1. No Action.
2. De-designate AGR (agricultural irrigation) as a beneficial use within the horizontal boundary to the variable vertical depths represented in **Figure B** based on a groundwater quality threshold of 3,000 $\mu\text{mhos/cm EC}$ (ca. 2,000 mg/L TDS); de-designate AGR (livestock watering) as a beneficial use within the horizontal boundary to the variable vertical depths represented in **Figure C** based on a groundwater quality threshold of 7,500 $\mu\text{mhos/cm EC}$ (ca. 5,000 mg/L TDS).
3. Develop classes of AGR uses that better represent irrigation and stock watering limitations at different groundwater salinity concentrations
4. Establish site-specific AGR salinity objectives for the Tulare Lakebed area.
5. Establish refined horizontal/vertical boundaries or thresholds for AGR protection (agricultural irrigation or livestock watering) (as currently shown in **Figures B and C**, respectively) based on information developed during the CEQA scoping process or through the ongoing work of CV-SALTS.

The Central Valley Water Board, in coordination with the CV-SALTS initiative, is seeking input regarding these and any other potential alternatives, significant impacts, and mitigation measures that should be analyzed as part of the proposed project. These alternatives, others identified during the scoping session, and/or a combination of alternatives, will form the basis for the final alternatives evaluated during the Basin Plan Amendment Process.

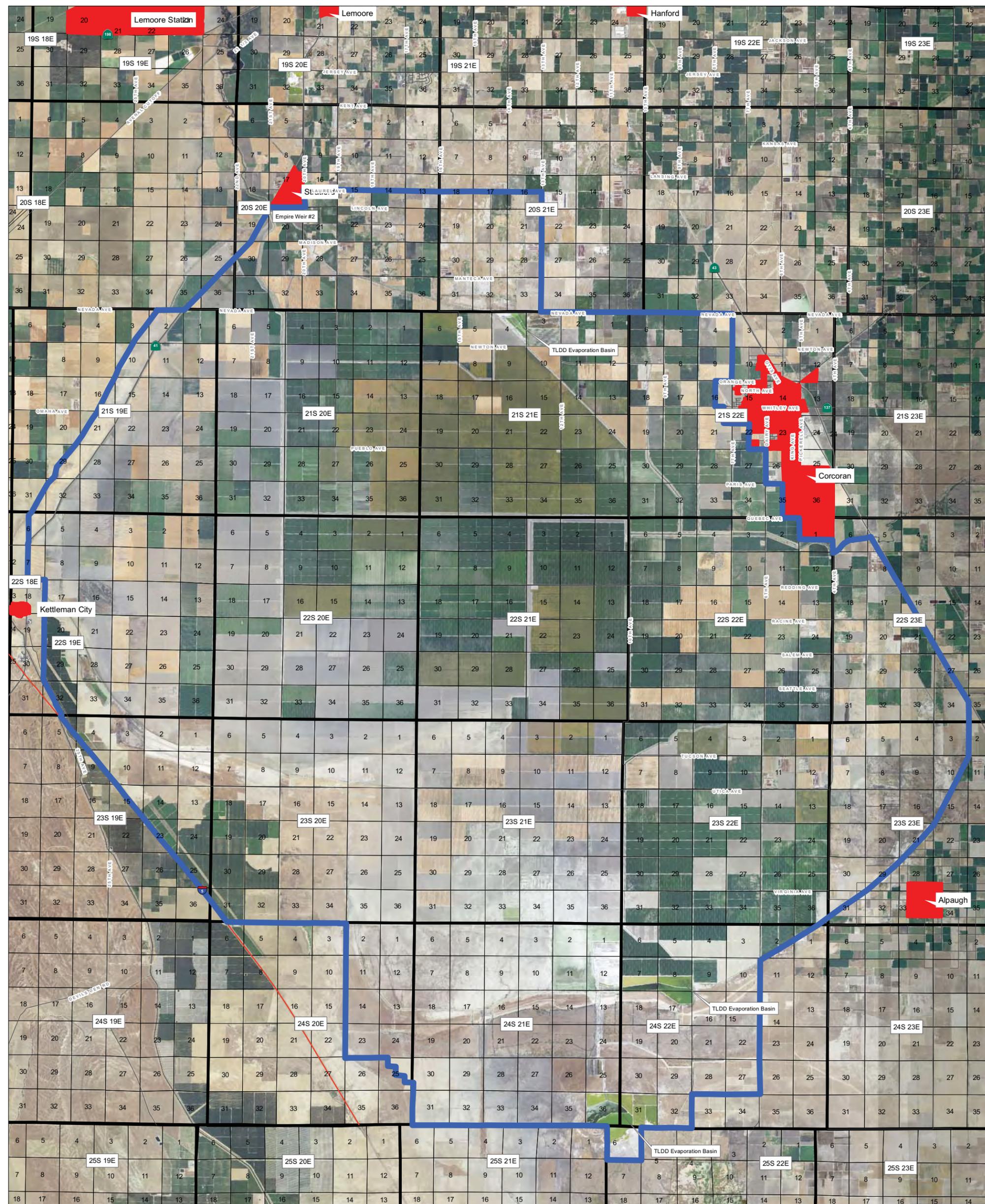
REFERENCES:

Ayers, R.S. and D.W. Westcot. 1985. *Water Quality for Agriculture*. Food and Agricultural Organization, Irrigation and Drainage Paper 29 Rev. 1, FAO, United Nations, Rome, 174 p.

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Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS). 2013. *Salt and Nutrients: Literature Review for Stock Drinking Water Final Report*. Report prepared by Kennedy/Jenks Consultants. May.

National Academy of Sciences (NAS). 1974. *Nutrients and Toxic Substances in Water for Livestock and Poultry: A Report of the Subcommittee on Nutrient and Toxic Elements in Water*. Washington, D.C.



Legend

- Originally Proposed Delisting Boundary
- Cities/Towns

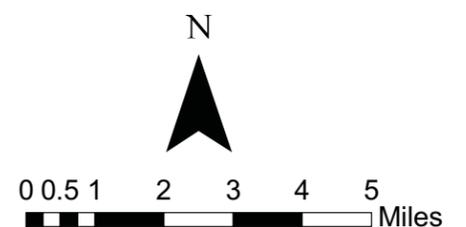


FIGURE 1: PROJECT AREA BOUNDARY

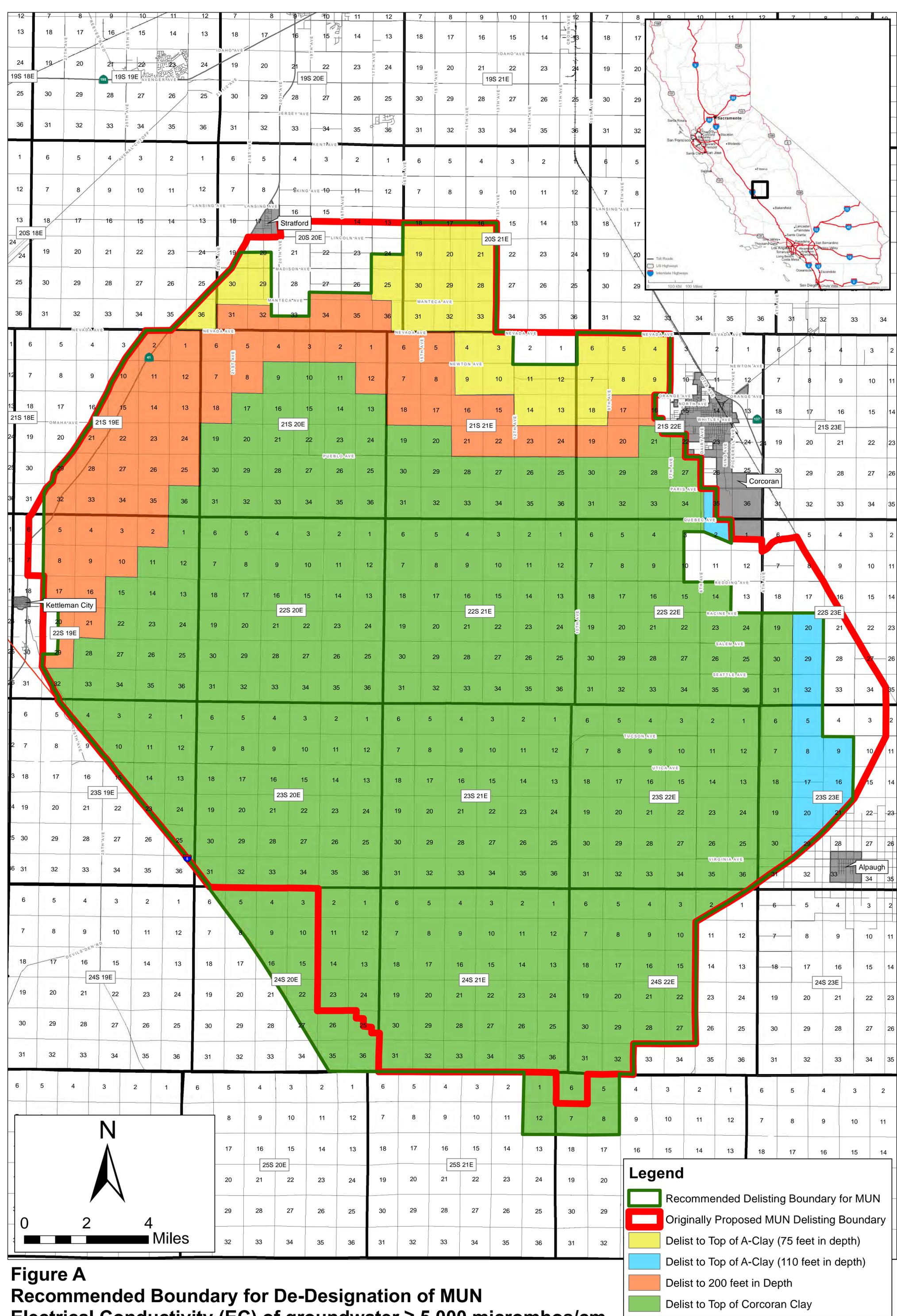


Figure A
Recommended Boundary for De-Designation of MUN
Electrical Conductivity (EC) of groundwater $\geq 5,000$ micromhos/cm

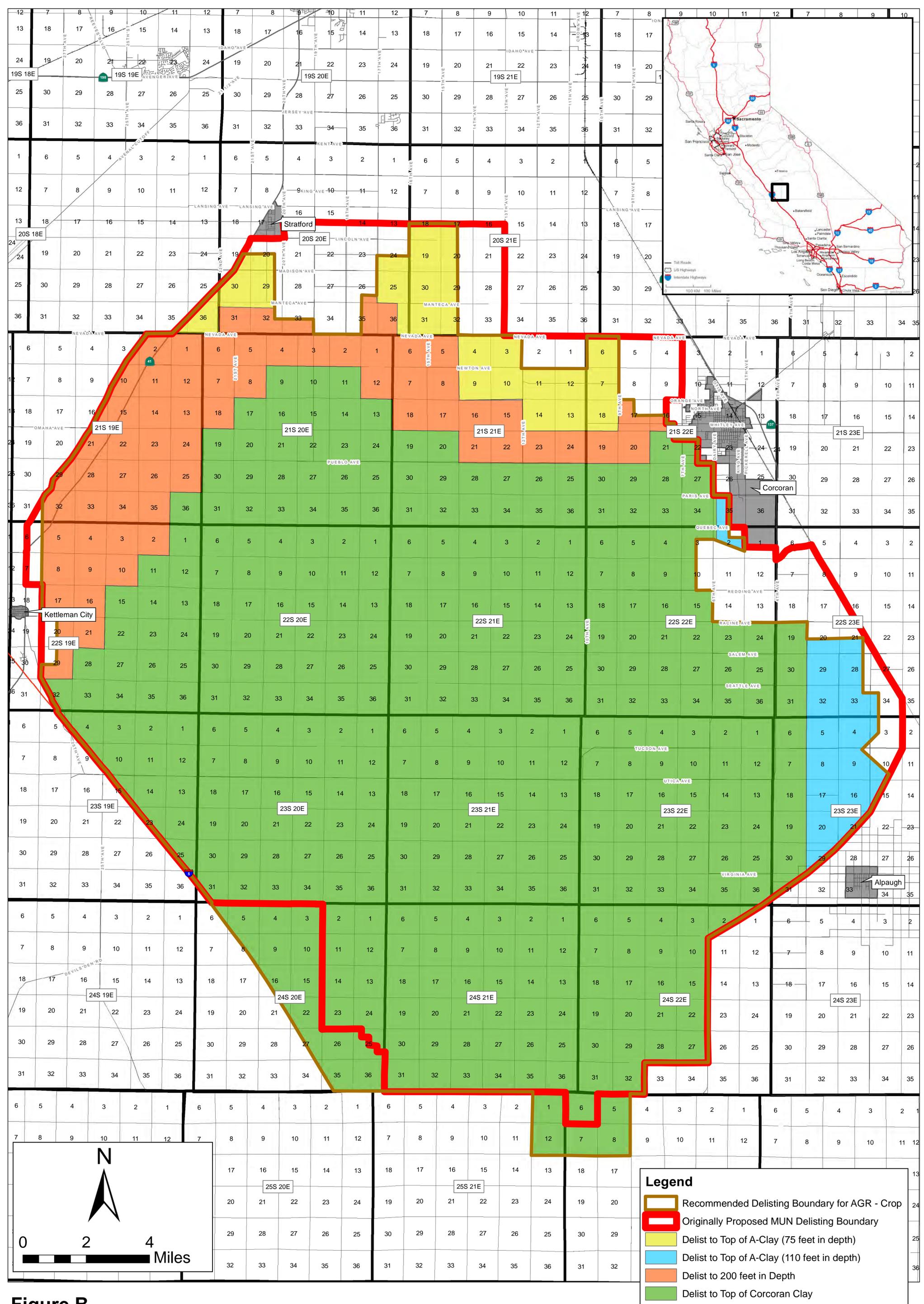


Figure B
Recommended Boundary for De-Designation of AGR - Crop Irrigation
Electrical Conductivity (EC) of groundwater $\geq 3,000$ micromhos/cm

Path: V:\CV Salts\CV salt map Vertical Delisting Depth - AGR Crop.mxd

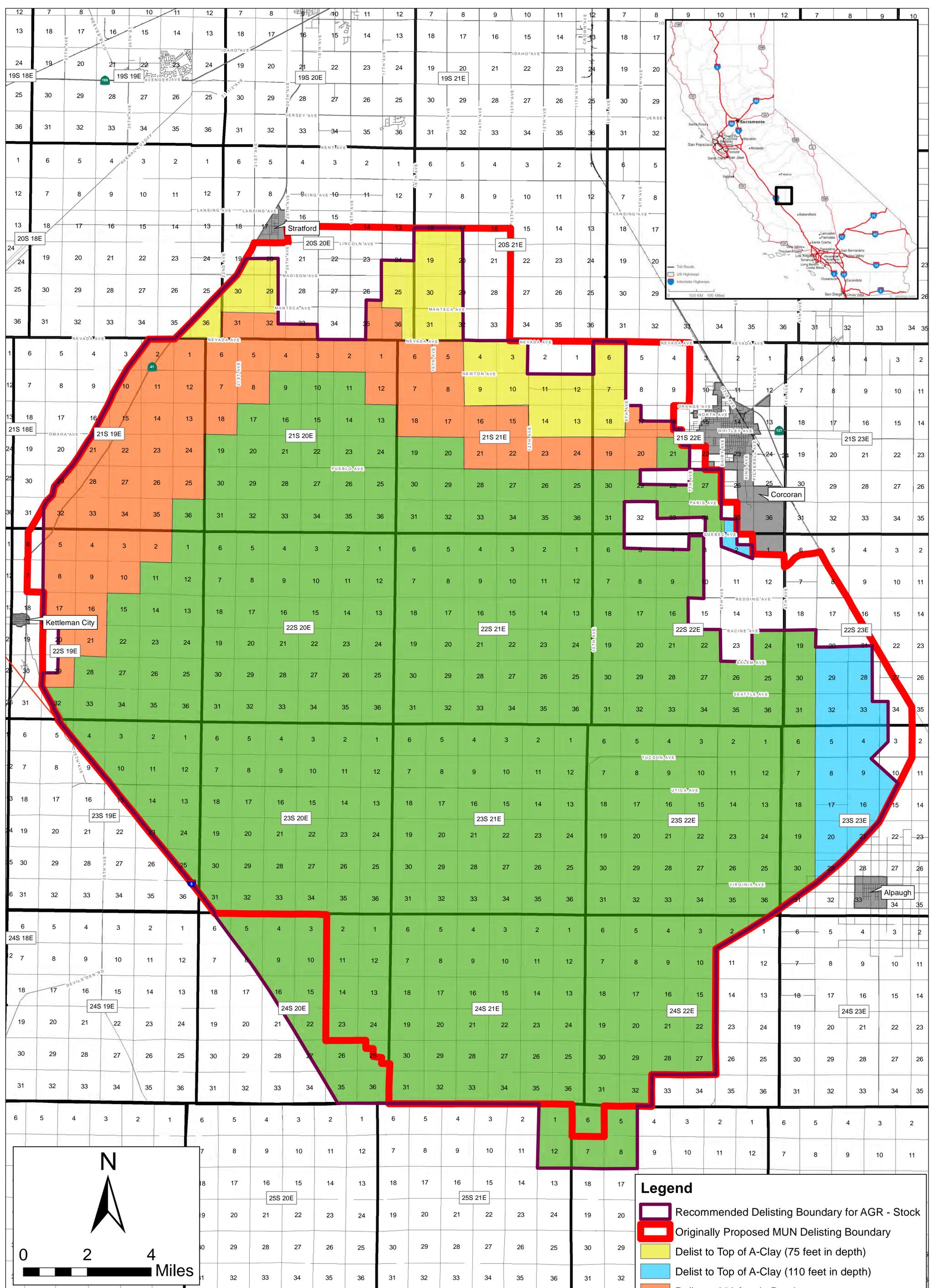


Figure C
Recommended Boundary for De-Designation of AGR – Stock Watering
Electrical Conductivity (EC) of groundwater $\geq 7,500$ micromhos/cm

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