1) Nominate surface waterbody, explicitly designated MUN in the Basin Plan that should be exempt.

2) Nominate surface waterbody, not explicitly designated MUN in the Basin Plan, that should be exempt.
   - Many lateral drains and reclamation drains that drain into the Colusa Basin Drain and Sutter Bypass.
   - Willow Slough Bypass and Toe Drain.
   - Nearest downstream municipal water supply intake to Willow Slough Bypass and Toe Drain is probably in the Bay Area.

3) Nominate a groundwater basin, explicitly designated MUN in the Basin Plan, that should be exempt from that designation.
   - Sacramento and San Joaquin River Basin Plan fails to actually identify groundwater basins. Basin Plan designates MUN through a blanket designation.

4) Nominate a groundwater basin (or sub-basin), not explicitly designated MUN in the Basin Plan that should be exempt from designation.
   - Definition of groundwater in the Basin Plan includes all subsurface waters that occur in fully saturated zones and fractures within soils and other geologic formations.
   - Should consider excluding certain first encountered ground waters from definition, or de-designating MUN from first encountered ground water that is not capable of supporting MUN.

5) Nominate a surface waterbody not yet named in the Basin Plan, that should be explicitly designated MUN.
   - None known.

6) Nominate a groundwater basin, not yet named in the Basin Plan, that should be explicitly designated MUN because there is a municipal water supply well operating in that waterbody.
   - None are named and many should be.

7) What additional factor(s), other than those already identified in the state Sources of Drinking Water Policy, should be used to demonstrate that a waterbody is not likely to serve as a potential drinking water supply?
   - Is it an agricultural drain
   - Need to consider if compliance with the Surface Water Treatment Rule will make the water compliant for MUN uses
   - Would DPH approve its use as a source of drinking water
   - Is it effluent dependent
Homework for CV-Salts Executive Committee

Written Responses Due at 5:00p (PDT) on Monday April 4th

Submitted by Bobbi Larson

1) Nominate a surface waterbody (lake or stream), explicitly designated MUN in the Basin Plan, that should be exempt from that designation. Explain how the waterbody meets one or more of the exemption criteria established by the state Sources of Drinking Water Policy. Identify the nearest downstream municipal water supply intake.

I am not aware of any waters meeting this description.

2) Nominate a surface waterbody (lake or stream), not explicitly designated MUN in the Basin Plan, that should be exempt from that designation. Explain how the waterbody meets one or more of the exemption criteria established by the state Sources of Drinking Water Policy. Identify the nearest downstream municipal water supply intake.

(A) Reclamation District 777 Lateral Drain No. 1, Sutter County.

Meets exception 2(b): for waters in systems designed or modified for the primary purpose of conveying or holding agricultural drainage waters

Lateral Drain No. 1 is tributary to the East Interceptor Canal, then Wadsworth Canal, and then the Sutter Bypass. None of these are used for municipal supply. Nearest downstream municipal drinking water intake is the City of West Sacramento, some 40 to 50 ditch/river miles downstream on the Sacramento River.

(B) Peck Drain, Merced County

Meets exception 2(b): for waters in systems designed or modified for the primary purpose of conveying or holding agricultural drainage waters

The Peck Drain carries only treated effluent, agricultural tailwater and agricultural and urban stormwater runoff. Consequently, upstream flows only occur during winter and irrigation seasons, and the downstream flows are effluent dominant during most of the year. The Peck Drain flows east to the Atwater Drain. The Atwater Drain terminates in the Merced National Wildlife Refuge (Refuge) in the vicinity of Sunrise Lake. Water within the Refuge has the potential to enter the East Side Canal depending upon rainfall, and the East Side Canal is periodically diverted to the San Joaquin River just south of its confluence to the Merced River.

I am not certain where the nearest downstream municipal drinking water intake is located, but it is at least 18 miles from the Peck Drain to the San Joaquin River.
3) Nominate a groundwater basin, explicitly designated MUN in the Basin Plan, that should be exempt from that designation. Explain how the groundwater basin meets one or more of the exemption criteria established by the state Sources of Drinking Water Policy. Identify the nearest municipal water supply well.

The Sacramento San Joaquin Basin Plan does not include specific groundwater designations but simply deems “all” groundwaters as “suitable or potentially suitable” for the MUN use.

I am not aware of any waters within the Tulare Lake Basin meeting this description, but I am less familiar with that Basin Plan.

4) Nominate a groundwater basin (or sub-basin), not explicitly designated MUN in the Basin Plan, that should be exempt from that designation. Explain how the groundwater basin or sub-basin meets one or more of the exemption criteria established by the state Sources of Drinking Water Policy. Identify the nearest municipal water supply well. If nominating a sub-basin, describe the boundaries that will be used to delimit the relevant sub-basin from the adjacent groundwater basins and sub-basins.

The Sacramento San Joaquin Basin Plan defines all subsurface waters that occur in fully saturated zones and fractures within soils and other geologic formations as MUN. This has led to a number of compliance issues. It would make more sense to omit certain first encountered ground waters from this definition, or to de-designate MUN from first encountered ground water that is not capable of supporting MUN, or to include a spatial component such that only certain waters within an aquifer are designated MUN.

5) Nominate a surface waterbody, not yet named in the Basin Plan, that should be explicitly designated MUN because there is a municipal water supply intake operating in that waterbody.

I am not aware of any waters meeting this description.

6) Nominate a groundwater basin, not yet named in the Basin Plan, that should be explicitly designated MUN because there is a municipal water supply well operating in that waterbody.

I am not aware of any waters meeting this description.

7) What additional factor(s), other than those already identified in the state Sources of Drinking Water Policy, should be used to demonstrate that a waterbody is not likely to serve as a potential drinking water supply? (Example: what consideration, if any, should be given to DPH regulations when evaluating existing and potential uses?)

CDPH regulations and other laws that preclude the use of the water should be relevant. For example, under current regulations, even if a POTW were to discharge water that
had been treated using reverse osmosis, CDPH would not allow its use unless there was at least 20:1 dilution with other water sources. Because municipal supply is not an “in-stream” use, and the application and approval process for new drinking water intakes is lengthy, the MUN designation can be added at such time as it is needed to protect a new drinking water uses.

Overall, Resolution 88-63 includes appropriate exceptions. The problem is that those exceptions have been nullified such that instead of being implemented based on the weight of the evidence, an individual Basin Plan amendment is required in each and every case to “de-designate” a use that never existed and never will.

NOTE: the purpose of this exercise is not to develop a comprehensive or exhaustive list of all waters that should or should not be designated MUN. Rather, the purpose is to identify waters that clearly and meet the exemption criteria set forth in the Sources of Drinking Water Policy that can serve as uncontroversial reference archetypes for making subsequent MUN determinations. Nominate the most obvious example you can think of.
Daphne, Dan, and Tim

I've been contemplating your homework assignment; I wasn't able to attend the meeting at which this came up, but I am familiar with the discussion from prior meetings. It's also been a recurring topic at meetings about the irrigated ag regulatory program.

Among the many difficulties in removing the MUN designation from a groundwater basin is the need to account for the presence of unregulated and unmapped domestic wells, of which there more than 600,000 in Region 5 (according to USGS data). It is likely that any aquifer will contain a population of domestic wells in its recharge area.

Data on domestic wells is sketchy, but the GAMA program has conducted testing in several Region 5 counties (http://www.swrcb.ca.gov/gama/domestic_well.shtml) That data could be augmented by using the location of cleanup wells, which are shallow and tend to be located near community water supplies. I'm attaching some screenprints from the GAMA Geotracker database to illustrate this.

My request would be that any future consideration of MUN designated aquifers include a discussion of domestic wells as well as public supply wells.

Thank you,

Jennifer Clary
Policy Analyst
Clean Water Action

O: (415) 369-9171
C: (707) 483-6352

111 New Montgomery St., Ste. 600
San Francisco, CA 94105

-----Original Message-----
From: "Daphne Orzalli" <dorzalli@cvsalinity.org>
Sent: Saturday, March 26, 2011 6:04pm
To: "Daphne Orzalli" <dorzalli@cvsalinity.org>
Subject: Exec Committee Homework Assignment #1

The following email was transmitted to the committee on Thursday, 3/24 but due to a network problem some members may not have received their copy.

CV Salts Executive Committee Members:

As discussed in the March 17th meeting, attached (and pasted below) is the first homework assignment from
Homework for CV-Salts Executive Committee

Written Responses Due at 5:00p (pdt) on Monday, April 4th

Central Valley Water Board Responses (Note: it is inappropriate for Water Board staff to identify specific water bodies that should be exempt from current Basin Plan requirements. Conditions that warrant further review are noted. Assumption was made that “explicitly designated” means that the water body is named in the Basin Plan, while “not explicitly designated” means that the water body is not specifically named in the Basin Plan.):

1) Nominate a surface waterbody (lake or stream), explicitly designated MUN in the Basin Plan, that should be exempt from that designation. Explain how the waterbody meets one or more of the exemption criteria established by the state Sources of Drinking Water Policy. Identify the nearest downstream municipal water supply intake.

Side Note: The State Water Resources Control Board Water Rights Information Management System (eWRIMS), has GIS locations for all appropriated domestic and municipal diversions and are currently loading information for all similar riparian diversions. Water Rights has agreed to provide a GIS layer of these diversions to CVSalts (that can be linked/overlaid with the BUOS database) and is currently estimating the time needed to complete the task.

2) Nominate a surface waterbody (lake or stream), not explicitly designated MUN in the Basin Plan, that should be exempt from that designation. Explain how the waterbody meets one or more of the exemption criteria established by the state Sources of Drinking Water Policy. Identify the nearest downstream municipal water supply intake.

Constructed agricultural drains and reconstructed, ag dominated natural water bodies as identified in the September 1992 Central Valley Water Board item responding to requirements of the Water Quality Control Plan for Inland Surface Waters of California (1991), AFTER verification of the current status of the named water bodies and whether the water bodies are adequately monitored under the Irrigated Lands Regulatory Program.

Exemption 2b of the Drinking Water Policy exempts all surface water “in a system designed or modified for the primary purpose of conveying or holding agricultural drainage waters, provided that the discharge from such systems is monitored to assure compliance with all relevant water quality objectives as required by the Regional Boards”. In 1992, Central Valley Regional Water Board staff with direct input from over 350-water agencies, identified and named all surface water bodies dominated by agricultural discharges within the Region as required by the Water Quality Control Plan for Inland Surface Waters of California (1991). In September 1992, the Central Water Board approved the list of 160 natural water bodies dominated by agricultural discharge, extending over 1,512 miles; and 6,319 constructed agricultural facilities,
extending over 19,812 miles. The approval included a process for determining the category a surface water body fell into (e.g. ag dominated natural water body, constructed facility, re-constructed natural water body).

The process utilized to categorize surface water bodies was re-evaluated by the Agricultural Water Task Force—a collaborative stakeholder group formed by the State Water Resources Control Board to make recommendations on how to best implement water quality standards in agricultural water. A formal recommendation from the group was presented to the State Water Board in October 1995. Part of the recommendation expanded the process for categorization into five options depending on how detailed the final category was to be (e.g. distinguishing between supply and drainage facilities and those allowing mixed uses).

Other categories to be investigated are areas of natural mineralization such as natural hot springs and also areas commonly found in the middle of established mining districts. Near mines, ground water is degraded due to interaction of precipitation infiltrating into the mineralized area and dissolving mineral constituents (in addition to salt, specific trace elements are also commonly elevated such as arsenic, mercury, lead and cadmium). The mineral laden ground water may flow out old open mine portals and into surface water or if the portals have been plugged flow as the base flow contributing to the streams. It is unlikely that if all the mine portal flows were stopped and or treated, the streams would be able to meet standards. While many of these areas are remote and have adequate dilution before they may be actually used as a direct source of drinking water, the blanket designation of MUN does not distinguish this.

3) Nnominate a groundwater basin, explicitly designated MUN in the Basin Plan, that should be exempt from that designation. Explain how the groundwater basin meets one or more of the exemption criteria established by the state Sources of Drinking Water Policy. Identify the nearest municipal water supply well.

4) Nnominate a groundwater basin (or sub-basin), not explicitly designated MUN in the Basin Plan, that should be exempt from that designation. Explain how the groundwater basin or sub-basin meets one or more of the exemption criteria established by the state Sources of Drinking Water Policy. Identify the nearest municipal water supply well. If nominating a sub-basin, describe the boundaries that will be used to delimit the relevant sub-basin from the adjacent groundwater basins and sub-basins.

5) Nnominate a surface waterbody, not yet named in the Basin Plan, that should be explicitly designated MUN because there is a municipal water supply intake operating in that waterbody.

See note under question #1. It should be understood that many of the water bodies in the eWRIMS database are listed as “Un-named”.

CVS Homework Assignment #1 April 4, 2011 Page #9
6) Nominate a groundwater basin, not yet named in the Basin Plan, that should be explicitly designated MUN because there is a municipal water supply well operating in that waterbody.

7) What additional factor(s), other than those already identified in the state Sources of Drinking Water Policy, should be used to demonstrate that a waterbody is not likely to serve as a potential drinking water supply? (Example: what consideration, if any, should be given to DPH regulations when evaluating existing and potential uses?)

Additional note: The Water Board Basin Planning Roundtable is investigating the development of a refined MUN use that clarifies that the use would only be appropriate after treatment. There is no specific time line for this effort.

DPH regulations are heavily weighted and their opinion sought when evaluating appropriate beneficial uses of a water body during regulatory action (e.g. permitting a waste water discharge into a surface water). The final decision is up to our Board during a public hearing.

NOTE: the purpose of this exercise is not to develop a comprehensive or exhaustive list of all waters that should or should not be designated MUN. Rather, the purpose is to identify waters that clearly and meet the exemption criteria set forth in the Sources of Drinking Water Policy that can serve as uncontroversial reference archetypes for making subsequent MUN determinations. Nominate the most obvious example you can think of.
Homework for CV-Salts Executive Committee

Written Responses Due at 5:00 p.m. (PDT) on Thursday, March 30th

1) Nominate a surface waterbody (lake or stream), explicitly designated MUN in the Basin Plan, that should be exempt from that designation. Explain how the waterbody meets one or more of the exemption criteria established by the state Sources of Drinking Water Policy. Identify the nearest downstream municipal water supply intake.

2) Nominate a surface waterbody (lake or stream), not explicitly designated MUN in the Basin Plan, that should be exempt from that designation. Explain how the waterbody meets one or more of the exemption criteria established by the state Sources of Drinking Water Policy. Identify the nearest downstream municipal water supply intake.

3) Nominate a groundwater basin, explicitly designated MUN in the Basin Plan, that should be exempt from that designation. Explain how the groundwater basin meets one or more of the exemption criteria established by the state Sources of Drinking Water Policy. Identify the nearest municipal water supply well.

4) Nominate a groundwater basin (or sub-basin), not explicitly designated MUN in the Basin Plan, that should be exempt from that designation. Explain how the groundwater basin or sub-basin meets one or more of the exemption criteria established by the state Sources of Drinking Water Policy. Identify the nearest municipal water supply well. If nominating a sub-basin, describe the boundaries that will be used to delimit the relevant sub-basin from the adjacent groundwater basins and sub-basins.

5) Nominate a surface waterbody, not yet named in the Basin Plan, that should be explicitly designated MUN because there is a municipal water supply intake operating in that waterbody.

6) Nominate a groundwater basin, not yet named in the Basin Plan, that should be explicitly designated MUN because there is a municipal water supply well operating in that waterbody.

7) What additional factor(s), other than those already identified in the state Sources of Drinking Water Policy, should be used to demonstrate that a waterbody is not likely to serve as a potential drinking water supply? (Example: what consideration, if any, should be given to DPH regulations when evaluating existing and potential uses?)

NOTE: the purpose of this exercise is not to develop a comprehensive or exhaustive list of all waters that should or should not be designated MUN. Rather, the purpose is to identify waterbodies that clearly meet the exemption criteria set forth in the Sources of Drinking Water Policy that can serve as uncontroversial reference archetypes for making subsequent MUN determinations. Nominate the most obvious example you can think of.
Homework Assignment 1(a)
Nominate a surface waterbody (lake or stream), explicitly designated MUN in the Basin Plan, that should be exempt from that designation. Explain how the waterbody meets one or more of the exemption criteria established by the state Sources of Drinking Water Policy. Identify the nearest downstream municipal water supply intake.

Reconsider Municipal and Domestic Supply (MUN) as a Potential Beneficial Use on the Lower San Joaquin River

**Designation Needing Review:** Municipal and Domestic Supply (MUN) is designated as a potential beneficial use of the San Joaquin River for the reaches from the Mendota Dam to Vernalis (Mendota Dam to Sack Dam, Sack Dam to Mouth of Merced River and Mouth of Merced River to Vernalis). Information presented shows the potential beneficial use (P) designation for MUN for the Lower San Joaquin River from the Mendota Dam to Vernalis may not exist or have the potential to exist.

**Preliminary Information Available to the LSJR Committee:**
- Flow in the San Joaquin River from the Mendota Dam to Vernalis is highly regulated and made up primarily of operational releases for irrigation use, groundwater accretions from poor quality groundwater and agricultural return flows of varying quality (RWQCB Salt and Boron TMDL Staff Report);
- River flow in this reach is highly variable and may not provide sufficient volume for municipal or domestic supply;
- Surveys of this River reach in 1950, 1975 and again in 1985 showed that no municipal or domestic supply use or diversions were being made;
- There are no known water right permits or applications pending for municipal or domestic supply use;
- This River reach may be over appropriated at the present time and unlikely that any new use would be permitted;
- New flow requirements for Delta restoration may make new or expanded water right permits on the San Joaquin River unlikely;
- Even though the beneficial use has been listed as “potential” for almost 40 years, there is no known record of an entity or a plan in the works for such a use;
- The State Water Board’s WQ 85-1 Technical Committee did a complete review of beneficial use on the San Joaquin River in 1985 from the Salt Slough inflow to Vernalis. This Committee reported that no municipal or domestic supply uses existed and such a use was unlikely and therefore the designation should be considered for removal from the Basin Plan; and
- The California Department of Public Health, which regulates municipal and domestic water supply systems has stated in correspondence to Stanislaus County Department of Environmental Health that they will not permit a municipal or domestic use of the Lower San Joaquin River under any conditions.
Impact from Salinity: When evaluated against MCL’s for salt in drinking water as established by the California Department of Public Health, the MUN beneficial use would be impacted by the salinity levels presently found in the Lower San Joaquin River.
Assignment #2a

Nominate a surface waterbody (lake or stream), not explicitly designated MUN in the Basin Plan, that should be exempt from that designation. Explain how the waterbody meets one or more of the exemption criteria established by the state Sources of Drinking Water Policy. Identify the nearest downstream municipal water supply intake.

Del Puerto Creek¹ (Stanislaus County)

Del Puerto Creek is a tributary to the San Joaquin River. Del Puerto Creek enters the San Joaquin River from the west between the Merced River and Tuolumne River inflows from the east. The Del Puerto Creek Watershed covers 76.2 square miles² above the point where it passes under Interstate Highway 5 west of the City of Patterson. The watershed is dominated in the west by a series of high ridges up to 3,600 feet above sea level to less than 200 feet above sea level where it passes under Interstate Highway 5. After passing under Interstate Highway 5, Del Puerto Creek continues to flow eastward to the San Joaquin River passing through irrigated agricultural areas near the City of Patterson.

Upstream of Interstate Highway 5, Peach Tree and Adobe Canyon form the two principal tributaries from the south while Deer Park Canyon Creek is the major northern branch. After the confluence of Deer Park Canyon, the North Fork Del Puerto Creek and Washington Canyon Creek are the only significant tributaries³.

Del Puerto Creek is a rainfall dominated ephemeral creek with 98% of the creek flow occurring during the rainy periods from November to May each year. USGS flow records show that there are many periods, some extending up to 5 months, when there is no flow in the creek as it passes under Interstate Highway 5. In critical dry years or a series of dry years, flow in the creek is very low and disappears in early spring. The average annual discharge for a 25-year period of USGS record shows the creek annual flow varying from 34,560 acre feet per year in 1983 to 21 acre-feet in 1977. Flow is heavily dependent upon the rainfall year. Below Interstate Highway 5, the Del Puerto Creek channel is highly modified and acts as a local drain to the river for the agricultural and urban areas in and around the City of Patterson. There is flow in this lower reach during the dry periods but this is made up of 100% agricultural irrigation return flows.

¹ In this assignment, Del Puerto Creek is being used as an example that can also be applied to conditions in 40 other named creeks on the Westside of the San Joaquin River (Table 1) and their tributaries, both named and unnamed. A similar write-up could be prepared for each of these creeks and their tributaries. In addition, a similar description can also be prepared for numerous ephemeral creeks on the eastern side of the San Joaquin River. The eastside ephemeral creeks originate in the lower elevations of the eastside foothills (interfan areas) or in the rolling grassland areas of the eastside San Joaquin Valley. These eastside ephemeral creeks respond to rainfall events and quickly become dry in late spring or early summer as they only drain lower elevation Valley floor areas.
³ Ibid., p79.
There are no discharges to the stream\textsuperscript{4} that would impact water quality upstream of its passage under Interstate Highway 5. The primary land use in the upper watershed (upstream of Interstate Highway 5) is cattle grazing. Many of the cattle have direct access to the creek. Downstream of Interstate Highway 5 there are a number of irrigation return flows to the creek that then find their way to the San Joaquin River via the Del Puerto Creek Channel. The lower reaches (below Interstate Highway 5) are completely dominated by irrigation return flows.

Water quality samples have been collected by both the California Department of Water Resources and the United States Geological Survey. The data base available for the monitoring site upstream of Interstate Highway 5 shows\textsuperscript{5} median salinity and boron concentrations of 1,350 μmhos/cm and 1.6 mg/L, respectively. The high salt and boron are concentrations are likely the result of 35% of the watershed developing from marine formations\textsuperscript{6} that are known to be high in salt and boron. Both salt and boron concentrations increase as flow decreases and many times exceed the median values.

Del Puerto Creek has a beneficial use designation through the tributary rule of “Potential” for MUN uses and according to the Basin Plan must be protected for such a use. The use of the tributary rule occurs as the Basin Plan currently designates Municipal (“MUN”) use as a potential beneficial use for Lower San Joaquin River\textsuperscript{7} which Del Puerto Creek is tributary to. The Basin Plan defines MUN use\textsuperscript{8} as “[u]ses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.” In this case, the application of the tributary rule places an unreasonable beneficial use on Del Puerto Creek for the following reasons:

1. There are no known or planned uses of Del Puerto Creek for MUN uses;
2. Water quality, although not exceeding the SWRCB Resolution 88-63 limitations, does exceed, on most occasions, the DHS water quality criteria for public drinking water supplies;
3. Del Puerto Creek does not provide a continuous supply for MUN uses as it is ephemeral and quality deteriorates dramatically as flow diminishes;
4. The lower reaches of Del Puerto Creek have been highly modified and now carry only agricultural return flows during a portion of the year;
5. Being a rainfall derived flow, flows often carry high levels of sediment and other runoff constituents; and
6. The nature of the geology in the watershed does not allow for improvement in water quality.

1. No Planned Uses for MUN

There are no known uses of Del Puerto Creek as a municipal or domestic water supply. The few residences in the watershed rely on wells for drinking water. Cattle and other

\textsuperscript{4} Ibid., p.81
\textsuperscript{5} Ibid., p. 29 and p. 141.
\textsuperscript{6} Ibid., p. 12.
\textsuperscript{7} Water Quality Control Plan for the San Joaquin River and Sacramento River Basins. Table II-1.
\textsuperscript{8} Ibid., pg. II-1.00.
natural contaminants as well as erratic flow regimes do not make it a viable drinking water source.

2. Poor Water Quality Exceeds DHS Criteria
A beneficial use that is not an existing use may be removed if naturally occurring pollutant concentrations prevent the attainment of the use (40 CFR §§131.10(g), (h)). Salinity and boron concentration are known to be high in Del Puerto Creek as runoff from the natural marine formations in the watershed carry high concentrations of these materials. Under natural conditions salinity levels exceed those suggested by DHS as needed for full use of a water supply for MUN (<900 μmhos/cm or μS/cm). In this case desalinization would be needed to achieve a full MUN water supply and there would be little likelihood of being able to discharge the brine from such an operation due to the low flow in the drainage basin. The need for treatment would increase as flow diminishes each year which would further limit the ability to discharge the brine from such treatment.

3. Low Flow Conditions May Prevent Use for MUN
The Sources of Drinking Water Policy only speaks to a yield of >200 gallons per day from a well to be a viable supply and does not consider surface water volume. The >200 gallons per day criteria does not appear to be set to determine usage but to set out a policy that the aquifer must provide a continuous or reliable water supply. Using that same principal, Del Puerto Creek goes dry for extended periods of time each year and would therefore not be a reliable water supply. Even when flowing at a low rate, Del Puerto Creek would not provide a reliable supply as its quality would be diminishing at the same time thus making it use questionable for extended periods.

The Clean Water Act recognizes the same principals. 40 CFR §§131.10(g), (h) states that a beneficial use that is not an existing use or cannot be attained by implementing effluent limits and cost-effective and reasonable best management practices for non-point source controls may be removed if:

“Natural, ephemeral, intermittent, or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating State water conservation requirements to enable uses to be met.”

4. Lower Reaches Effluent Dominated
Under the Sources of Drinking Water Policy, surface water may be exempt if:

“Either natural processes or human activity unrelated to a specific pollution incident have caused contamination that cannot reasonably be treated for domestic use using either Best Management Practices or best economically achievable treatment practices.”

As the lower reaches of Del Puerto Creek are dominated by agricultural return flows, this would likely prevent the attainment of the Sources of Drinking Water Policy mandates in this case. Treatment or control of the irrigation return flows would likely be the removal of the return flow and thus the lower reaches would not have sufficient flow to support the MUN beneficial use. (see # 3 above).
Not designating the lower reaches of Del Puerto Creek for MUN would be consistent with SWRCB Resolution 88-63 which states that the following exception applies:

“The water is in systems designed or modified for the primary purpose of conveying or holding agricultural drainage waters, provided that the discharge from such systems is monitored to assure compliance with all relevant water quality objectives as required by the Regional Board.”

A water body can be de-designated for MUN uses, even where the exceptions established in the Sources of Drinking Water Policy do not specifically apply. In considering de-designating Old Alamo Creek in Solano County for MUN uses, the State Water Board found the use designation inappropriate, even though none of the exceptions described in the Sources of Drinking Water Policy specifically applied. They made this finding even though Old Alamo Creek had more than 200 gallons per day of flow and was not specifically constructed to convey agriculture drainage or to collect or treat municipal wastewater or storm water.

DHS, the state agency responsible for approving drinking water supplies and regulating drinking water treatment, does not explicitly exclude treated sewage, effluent from groundwater cleanup operations, or agricultural returns and urban runoff from use as municipal or domestic supply. DHS has developed a policy, however, on what it terms “Extremely Impaired Sources.” DHS lists agricultural drainage, urban runoff and effluent dominated streams as examples of extremely impaired sources. Pursuant to the DHS policy, entities wishing to use such sources for drinking water must demonstrate that no other source of drinking water is available and, if DHS grants a permit, heavily treat and monitor the water used in order to protect public health. This is unlikely to happen on Del Puerto Creek as alternate MUN supplies are available; including groundwater.

DHS has also specifically notified the Stanislaus County Health Department that under no conditions would they approve the use of the San Joaquin River as a MUN supply due to sewage discharges from several major cities in the Central Valley and subsurface agriculture drainage from Mud and Salt Sloughs, and the persistence of agricultural irrigation return flow in the river. They considered this supply to be an extremely impaired source and subject to wide fluctuations in quality and therefore is unsuitable for domestic use. Thus if the San Joaquin River is considered by DHS as a non-source for MUN or potential MUN, then by the tributary rule, it likely would not apply to Del Puerto Creek as well as similar conditions exist.

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12 Ibid., p. 2.
13 Ibid., p. 4-7.
14 DHS letter from Cindy Forbes, Regional Director of Drinking Water Programs to Brian Kumimoto. April 13, 1996.
Since all of Alamo Creek’s natural flow had been diverted and its flow consisted almost entirely of waste discharges, the State Water Board concluded that MUN use was an inappropriate beneficial use and recommended that the CVRWQCB take action via Basin Plan amendment specifically exempting Old Alamo Creek from MUN uses\textsuperscript{15}. The Central Valley Water Board adopted the State Water Board’s conclusions in its staff report and Basin Plan amendment de-designating MUN uses for Old Alamo Creek\textsuperscript{16}.

In the case of Del Puerto Creek, all natural flow dries up due to the ephemeral nature of the creek and thus all the flow in the lower reaches (downstream of Interstate Highway 5) is considered effluent dominated.

5. Rainfall Carries Contaminants
Del Puerto Creek is a rainfall driven creek and therefore responds to rainfall events both in flow and quality. As a result of natural processes, previous mining operations and cattle grazing in the watershed, rainfall events sometimes derive considerable sediment and other contaminants thus making this flow marginal for use as a MUN supply. Due to the ephemeral nature of the flow, it is unlikely that it would be economical or practical to treat the volume of water Del Puerto Creek would deliver for MUN uses.

40 CFR §§131.10(g), (h) (Clean Water Act) states that a beneficial use that is not an existing use or may be removed if naturally occurring pollutant concentrations prevent the attainment of the use or human-caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place. This would be the case for treating rainfall runoff on Del Puerto Creek.

6. Geology Results in Poor Water Quality
At least 35\% of the Del Puerto Creek Watershed is made up of marine sediments which are known to be high in salts, boron and other trace elements. Water quality monitoring in the watershed shows that geology influences the quality of the stream flow. The data base available for the monitoring site upstream of Interstate Highway 5 shows\textsuperscript{17} median salinity and boron concentrations of 1,350 μmhos/cm and 1.6 mg/L, respectively. Data from greater than 50\% of the creeks surveyed on the western side of the San Joaquin River\textsuperscript{18} show electrical conductivity ranges from 550 to 9,250 μmhos/cm with most showing median electrical conductivity in excess of 1,000 μmhos/cm. Median boron concentrations range from 0.28 to 25 mg/L with most showing median concentrations in excess of 2.0 mg/L. Both of these concentrations directly relate to the extent of marine sediment formations in the watershed. It is unlikely that this can be modified or improved as it is a natural process and out of the control of most BMPs.

40 CFR §§131.10(g), (h) (Clean Water Act) states that a beneficial use that is not an existing use or may be removed if: Naturally occurring pollutant concentrations prevent

\textsuperscript{17} Ibid., p. 29 and p. 141.
\textsuperscript{18} See Table 2.
the attainment of the use. this is also recognized in SWRCB Resolution 88-63 (Sources of Drinking Water Policy) which states that:

“Either natural processes or human activity unrelated to a specific pollution incident have caused contamination that cannot reasonably be treated for domestic use using either Best Management Practices or best economically achievable treatment practices.”

7. Other Factors

The previous six factors are consistent with conditions in the Westside Creeks in the San Joaquin River Basin. A similar evaluation and conclusion that MUN beneficial uses did not exist and had no potential to exist was conducted in the Tulare Lake Basin during the original Basin Plan development in the early 1970’s. The conclusion was that there was a separate category for Westside Creeks listed in the Tulare Lake Basin Plan. Beneficial uses specific to the conditions in the Westside Creeks was proposed and adopted by the Central Valley Regional Board. MUN designations were not proposed for any of the Westside Stream Groups, principally due to the six factors listed above. In addition, MUN was not proposed for designation on any of the Valley Floor Stream Group which would include the Westside Creeks after they enter the valley floors zone.

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Table 1. Homework Assignment #1a – Listing of 40 Creeks on the Western Side of the San Joaquin River that Carry Similar Characteristics to Those Defined for Del Puerto Creek

<table>
<thead>
<tr>
<th>Watershed Number</th>
<th>Watershed Name</th>
<th>Drainage Basin Size (Sq. mi.)</th>
<th>Water Quality Sampling Station</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NORTHERN STREAM GROUP</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Sand Creek</td>
<td>11</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>Deer Valley Creek</td>
<td>5</td>
<td>Yes</td>
</tr>
<tr>
<td>3</td>
<td>Briones Valley Creek</td>
<td>7.5</td>
<td>No</td>
</tr>
<tr>
<td>4</td>
<td>Marsh Creek</td>
<td>42.5</td>
<td>Yes</td>
</tr>
<tr>
<td>5</td>
<td>Kellogg Creek</td>
<td>20</td>
<td>Yes</td>
</tr>
<tr>
<td>6</td>
<td>Unnamed Creek</td>
<td>5.2</td>
<td>No</td>
</tr>
<tr>
<td>7</td>
<td>Brushy Creek</td>
<td>14.6</td>
<td>No</td>
</tr>
<tr>
<td>8</td>
<td>Bethany Reservoir Crk Area</td>
<td>12.9</td>
<td>No</td>
</tr>
<tr>
<td>9</td>
<td>Mountain House Creek</td>
<td>11.6</td>
<td>Yes</td>
</tr>
<tr>
<td>10</td>
<td>Patterson Run Creek</td>
<td>18</td>
<td>No</td>
</tr>
</tbody>
</table>

(Northern Stream Group Total) = 148.4

| **MIDDLE STREAM GROUP** |                                  |                              |                               |
| 11               | Corral Hollow Creek              | 65.2                         | Yes                           |
| 12               | Deep Gulch Creek                 | 15.8                         | No                            |
| 13               | Lone Tree Creek                  | 22.6                         | Yes                           |
| 14               | Hospital Creek                   | 36.2                         | Yes                           |
| 15               | Arkansas-Martin Creek Area       | 12                           | No                            |
| 16               | Ingram Creek                     | 20.4                         | Yes                           |
| 17               | Mile 33 Creek                    | 1.6                          | No                            |
| 18               | Kern Creek                       | 6.1                          | Yes                           |
| 19               | Del Puerto Creek                 | 76.2                         | Yes                           |
| 20               | Black Gulch Creek                | 3                            | Yes                           |
Table 2. Median Salinity, Boron, Selenium and Molybdenum Determined from Available Data Bases for Streams Draining the Eastern Slope of the Diablo Range of the Coast Range Mountains

<table>
<thead>
<tr>
<th>Watershed Number</th>
<th>CREEK</th>
<th>MEDIAN VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Salinity (μmhos/cm)</td>
</tr>
<tr>
<td>NORTHERN STREAM GROUP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Sand Creek</td>
<td>3,000</td>
</tr>
<tr>
<td>2</td>
<td>Deer Creek</td>
<td>4,950</td>
</tr>
<tr>
<td>4</td>
<td>Marsh Creek</td>
<td>1,200</td>
</tr>
<tr>
<td>5</td>
<td>Kellogg Creek</td>
<td>1,800</td>
</tr>
<tr>
<td>7</td>
<td>Brushy Creek</td>
<td>1,100</td>
</tr>
<tr>
<td>9</td>
<td>Mountain House Creek</td>
<td>3,775</td>
</tr>
<tr>
<td>MIDDLE STREAM GROUP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Corral Hollow Creek</td>
<td>2,000</td>
</tr>
<tr>
<td>13</td>
<td>Lone Tree Creek</td>
<td>1,475</td>
</tr>
<tr>
<td>14</td>
<td>Hospital Creek</td>
<td>855</td>
</tr>
<tr>
<td>16</td>
<td>Ingram Creek</td>
<td>2,000</td>
</tr>
<tr>
<td>18</td>
<td>Kern Creek</td>
<td>5,750</td>
</tr>
<tr>
<td>19</td>
<td>Del Puerto Creek</td>
<td>1,350</td>
</tr>
<tr>
<td>20</td>
<td>Black Gulch Creek</td>
<td>8,500</td>
</tr>
<tr>
<td>22</td>
<td>Salado Creek</td>
<td>2,600</td>
</tr>
<tr>
<td>24</td>
<td>Crow Creek</td>
<td>4,800</td>
</tr>
<tr>
<td>26</td>
<td>Orestimba Creek</td>
<td>750</td>
</tr>
<tr>
<td>28</td>
<td>Garzas Creek</td>
<td>740</td>
</tr>
<tr>
<td>Watershed Number</td>
<td>CREEK</td>
<td>Salinity (μmhos/cm)</td>
</tr>
<tr>
<td>------------------</td>
<td>--------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>30</td>
<td>Quinto Creek</td>
<td>940</td>
</tr>
<tr>
<td>31</td>
<td>Romero Creek</td>
<td>1,000</td>
</tr>
<tr>
<td>32</td>
<td>Los Banos Creek</td>
<td>550</td>
</tr>
<tr>
<td>33</td>
<td>Salt Creek</td>
<td>8,800</td>
</tr>
<tr>
<td>34</td>
<td>Ortigalita Creek</td>
<td>5,700</td>
</tr>
<tr>
<td>38</td>
<td>Little Panoche Ck</td>
<td>1,700</td>
</tr>
<tr>
<td></td>
<td>(above Reservoir)</td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>Little Panoche Ck</td>
<td>3,300</td>
</tr>
<tr>
<td></td>
<td>(below Reservoir)</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>Panoche-Silver Ck</td>
<td>9,250</td>
</tr>
<tr>
<td>40</td>
<td>Silver Creek</td>
<td>7,650</td>
</tr>
<tr>
<td>--</td>
<td>Cantua Creek</td>
<td>1,500</td>
</tr>
<tr>
<td>--</td>
<td>Los Gatos Creek</td>
<td>1,410</td>
</tr>
</tbody>
</table>
Assignment #2b

Nominate a surface waterbody (lake or stream), not explicitly designated MUN in the Basin Plan, that should be exempt from that designation. Explain how the waterbody meets one or more of the exemption criteria established by the state Sources of Drinking Water Policy. Identify the nearest downstream municipal water supply intake.

Agricultural Conveyance Facilities

The State Water Resources Control Board (State Water Board) adopted the Sources of Drinking Water Policy by Resolution 88-63. The policy states that all surface waters of the state are considered suitable or potentially suitable for MUN uses, unless one of the following exceptions apply:

1. The EC exceeds 5,000 μS/cm and the Regional Board does not expect the surface water to supply a public water system.

2. Either natural processes or human activity unrelated to a specific pollution incident have caused contamination that cannot reasonably be treated for domestic use using either Best Management Practices or best economically achievable treatment practices.

3. The water source provides insufficient water to supply a single well capable of producing, on average, a sustained yield of 200 gallons per day.

4. The water is in systems designed or modified to collect or treat municipal or industrial wastewaters, process waters, mining wastewaters, or storm water runoff, provided that the discharge from such systems is monitored to assure compliance with all relevant water quality objectives as required by the Regional Board.

5. The water is in systems designed or modified for the primary purpose of conveying or holding agricultural drainage waters, provided that the discharge from such systems is monitored to assure compliance with all relevant water quality objectives as required by the Regional Board.

Resolution 88-63 recognized that the current (as of 1988) “Water Quality Control Plans do not provide sufficient detail in the description of water bodies designated MUN to judge clearly what is, or is not, a source of drinking water for various purposes.” They found in the Resolution that “Where a body of water is not currently designated as MUN but, in the opinion of a Regional Board, is presently or potentially suitable for MUN, the Regional Board shall include MUN in the beneficial use designation.”

During the adoption of the Sources of Drinking Water policy, the State Water Board recognized that Agricultural drainage facilities (see the fifth exemption above) are not
suitable for MUN water supplies and should not be listed as such. The State Water Board also informed the attendees that the issue of how to deal with the remainder of the Ag distribution facilities would be taken care of during development of an Inland Surface Waters Plan. On April 11, 1991, the State Water Board adopted Resolution WQ 91-93, approving the Water Quality Control Plan for Inland Surface Waters of California or the Inland Surface Waters Plan (ISWP). The ISWP applies a group of objectives (not specifically related to the MUN beneficial use) to all surface water bodies. All agricultural supply canals and drains, whether constructed or flowing in natural channels were considered surface waters or waters of the State and must conform with the ISWP (State Attorney General’s Opinion No 65-259 [48 Ops. Cal. Atty. Gen. 30].

The State Water Board recognized that there was a huge disparity in the application of these objectives to agricultural conveyance and drainage facilities. To overcome this dilemma, the Regional Boards were to identify and prioritize agricultural drainage facilities for application of the ISWP objectives. By October 12, 1992, the Regional Boards were to identify and classify water bodies as either natural water bodies dominated by agricultural drainage or constructed to transport agricultural drainage. The Regional Boards were to use the categories of water bodies which were described in the ISWP. They were:

(b) Natural water bodies or segments thereof, that, as of the date of the adoption of the ISWP are dominated by agricultural drainage; and

(c) Water bodies or segments thereof, that, as of the date of the adoption of the ISWP, have been constructed for the primary purpose of conveying or holding agricultural drainage and were not natural water bodies which supported aquatic habitat beneficial uses. Such drains may include drains constructed in normally dry washes and low-lying areas.

To comply with the State Water Board direction, the Central Valley Water Board requested information from local districts on how their facilities were constructed and utilized. The Central Valley Water Board received over 364 informational reports from water, irrigation, drainage and reclamation districts throughout the Central Valley to assist the Board in compliance with this deadline. The district reports showed however that three other types of agriculturally dominated water bodies provide beneficial uses which would not exist without the flows resulting from irrigated agriculture. These three additional types of facilities were natural waterways used to transport agricultural supply water, constructed facilities used to transport agricultural supply water, and dry washes that have been reconstructed and realigned to be an integral component of the supply or drainage system.

Because of the complexity of the irrigation and drainage system in the Central Valley, Central Valley Water Board staff reviewed the reports submitted by the districts and placed the water bodies in one of the following subcategories based on the information supplied by the districts:

**Natural Water Body**
Category (b) Water Bodies:

(b1) - Natural water bodies dominated by agricultural drainage water.

(b2) – Natural water bodies dominated by agricultural supply water.

**Constructed Facilities**

Category (c) Water Bodies:

(c1) – Constructed facilities designed to carry agricultural flows or drainage.

(c2) – Constructed facilities designed to carry irrigation water and may, at times, carry recycled return flows.

(c3) – Natural dry washes that have been altered and now carry agricultural supply water or return flows during time periods.

In addition to the listing, the Regional Water Boards were to “establish a priority list of the listed category (b) and (c) water bodies to identify where early Regional Board action is necessary.” This was done using the State Water Board’s Clean Water Strategy and their potential to have water quality problems present or create similar problems downstream. The Regional Water Boards were also to “identify which numerical objectives defined in Table 1 and 2 of the ISWP are inappropriate for the category (b) water bodies based on available data.” For most agricultural drains, canals and natural water bodies dominated by these flows, there was little or no data available on most of the ISWP numerical objectives.

The Central Valley Water Board on September 25, 1992 adopted the listing of water bodies as required by the ISWP and submitted the listing to the State Water Board. The listing of agricultural conveyance and drainage facilities identified almost 6,500 water bodies (canals and drains) in the Central Valley that totaled 21,324 miles. Almost 1,800 of these facilities, totaling 5,227 miles in length, were within the San Joaquin River Basin. In the staff report it was noted that “Elevated boron and total dissolved solids concentrations are common in many water bodies dominated by agricultural drainage and in natural and constructed facilities that carry groundwater or recycled agricultural drainage water.” This is especially true in the San Joaquin River Basin. It was also noted that the application of water quality objectives was difficult as the designation of beneficial uses was complicated and different from a natural water body.

Unfortunately the ISWP was overturned by the Courts and the State Water Board made no effort to redo the plan. The State Water Board did, however, recognize the difficulty

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1 Appendix B to the Staff Report entitled Consideration of Water Body Designations to Comply with Provisions of the Water Quality Control Plan for Inland Surface Waters of California (ISWP) dated September 1992. Central Valley Regional Water Quality Control Board
of dealing with agricultural conveyance and drainage systems. In 1995, it appointed an “Agricultural Waters Task Force for Consideration of Issues Related to the Inland Surface Waters Plan”. That Task Force issued its findings in October 1995\(^2\) and their report was approved by the State Water Board.

For designation of beneficial uses, the ISWP Task Force agreed that these facilities were unique and should have different beneficial uses than natural water bodies\(^3\). Because of the variability in types and location of the facilities, the Task Force could not agree on assigning beneficial uses to them but did outline 5 options for consideration by the Regional Water Boards when assigning uses. These 5 options centered on how to designate aquatic life and recreations uses. In all 5 of the options, the Task Force assumed that the MUN beneficial would not be assigned to any of these facilities. The Task Force did assume however that water draining from these facilities to downstream water bodies must have sufficient protection to protect downstream municipal water supplies and cold water fisheries, where appropriate\(^4\).

It was anticipated that the Regional Water Boards would take the Task Force recommendations and do a through review of all water bodies and make such designation through a Basin Plan Amendment. The Central Valley Regional Board however during the Basin Plan updates only recognized the State Water Board’s Sources of Drinking Water Policy and applied it to all water bodies without any review as was expected by the Task Force Report to the State Water Board. This effort, while complying with the Basin Planning needs at minimal cost, has now resulted in a huge inconsistency in the application of beneficial use designation. By taking this approach, the MUN beneficial uses was assigned to all five of the water body categories identified by the 1992 Regional Board staff report on Ag facilities regardless of whether they were non-existent, existing or potential.

During the 1992 Central Valley Water Board evaluation of agricultural conveyance and drainage facilities it was identified that:

a. The use of agricultural conveyance and drainage facilities are often seasonal and flows during the non-use season may be very low or non-existent;

b. Elevated boron and total dissolved solids concentrations may be found in these facilities as many were dominated by agricultural drainage, groundwater or recycled irrigation and drainage water;

c. Elevated concentrations of pollutant may be found as a result of recycling of urban wastewater as the agricultural industry is being looked upon to assist in reuse of this water to make available freshwater supplies for other higher uses;

d. Recycling of irrigation and drainage water may cause concentrations to be elevated for sediment and pesticides which are not harmful to the agricultural industry but need to be kept out of natural waterways;


\(^3\) Ibid., p. 22.

\(^4\) Ibid., p. 25.
e. Many of the category (b) and (c) water bodies are subject to inflows of stormwater from urban areas as cities and others attempt to manage these flows; and

f. Maintenance operations in constructed canals and drains may cause water quality objective violations but are critical to maintaining the integrity of the facility’s use.

The inconsistency in application of the MUN beneficial use can be seen in the difference between the Water Board designations and Department of Health Services (DHS) policy on municipal water use. DHS, the state agency responsible for approving drinking water supplies and regulating drinking water treatment, does not explicitly exclude treated sewage, effluent from groundwater cleanup operations, agricultural return flows or urban runoff from use as municipal or domestic supply. DHS has developed a policy, however, on what it terms “Extremely Impaired Sources.” DHS lists agricultural drainage, urban stormwater, urban runoff, and effluent dominated streams as examples of extremely impaired sources. Pursuant to the DHS policy, entities wishing to use such sources for drinking water must demonstrate that no other source of drinking water is available and, if DHS grants a permit, heavily treat and monitor the water used in order to protect public health.

DHS has also specifically notified the Stanislaus County Health Department that under no conditions would they approve the use of the San Joaquin River as a MUN supply due to sewage discharges from several major cities in the Central Valley and subsurface agriculture drainage from Mud and Salt Sloughs, and the persistence of agricultural irrigation return flows in the river. They considered this supply to be an extremely impaired source and subject to wide fluctuations in quality and therefore is unsuitable for domestic use. Thus if the San Joaquin River is considered by DHS as a non-source for MUN or potential MUN, then by the tributary rule, it likely would not apply to any of the agricultural drainage and conveyance facilities in the San Joaquin River Basin because similar conditions may exist within these facilities.

While DHS policy does not specifically state a volume of supply necessary for being considered a MUN water supply, their past practices have excluded certain supplies as they feel there needs to be reliability in the availability of that supply. The Sources of Drinking Water Policy only speaks to a yield of >200 gallons per day from a well as a viable supply, it does not specifically define a minimum surface water volume. The >200 gallons per day criteria defined in the Sources of Drinking Water Supply does appear to set out a policy that the aquifer must provide a continuous or reliable water supply in order to be considered a MUN use. Using that same principal, agricultural drainage or conveyance facilities that go dry for extended periods of time each year would therefore

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7 Ibid., p. 2.
8 Ibid., p. 4-7.
9 DHS letter from Cindy Forbes, Regional Director of Drinking Water Programs to Brian Kumimoto. April 13, 1996.
not be a reliable water supply. Many maintenance operations are also conducted during the low flow periods and thus the facilities would not provide a reliable supply as its quality would diminish during these maintenance operations thus making it use questionable during these periods.

This apparent conflict between the broad-scale application of the MUN beneficial use to such facilities is inconsistent with the recent findings of the Central Valley Water Board on MUN beneficial use designations. For example, during the 1988 review of beneficial uses in Mud and Salt Sloughs in western Merced County (Grassland Watershed), staff recommended that the MUN designation not be applied to Mud and Salt Sloughs\textsuperscript{10}. This was consistent with the State Water Board Report WQ 85-1 which also recommended not designating MUN in both the San Joaquin River and the tributary sloughs. Unfortunately the State Water Board did not take a final decision on the Regional Water Board findings. Therefore no change was made from the present use of the tributary rule to designate beneficial uses (including MUN) in the Grassland Watershed. This was followed closely by the State Water Board Resolution 88-63 for the Sources of Drinking Water Policy.

A more detailed evaluation of the beneficial uses in the Grassland Watershed was conducted in 1995\textsuperscript{11}. This evaluation included not just Mud and Salt Sloughs but also the Grassland Wetland areas and the wetland channels carrying wetland water supplies and drainage. The findings of this study are similar to those of the other Ag-dominated conveyance and drainage facilities. The report states that\textsuperscript{12}:

\textit{“The assumed beneficial uses for water bodies in the Grassland watershed are likely not appropriate because of the differences in geology and hydrology of the watersheds that provide the primary source of flow fro the San Joaquin River, as compared to the watershed that drains into Mud Slough (north) and Salt Slough and other Grassland channels. In addition, the present physical and chemical character of the sloughs has developed as a result of an evolution of the hydrology from flooding and natural fluvial processes to a managed, and effluent-dominated system. Current uses of Mud Slough (north) and Salt Slough have developed from discharges to the sloughs, mainly agricultural and wetland drainage and are, therefore, effluent-dominated water bodies. The beneficial uses of wetland water supply channels are governed by wetland management practices including, water deliveries and drainage of wetlands. These channels are}
The report goes further to conclude that the landscape of the Grassland watershed and quantity and quality of water in the sloughs and channels has been greatly altered as a result of land use practices. These alternations led to changes in the environment and in the level of beneficial use supported. In many cases, the level of beneficial use supported is a direct result of supplying water to wetland areas and agriculture. The primary function of the channels is to convey supply water or drainage. Often flow is intermittent in these channels and dependent on wetland and agriculture practices. Extended periods of dryness are possible in these channels. Each of these channels carries various levels of beneficial use but does not carry the MUN beneficial use. This same decision should be made for the other ag-related channels in the San Joaquin River Basin to avoid costly Basin Plan Amendments to correct inconsistent designations made through blanket policies such as the Sources of Drinking Water Policy.

Another example of inconsistency that is costly to change or de-designate is Old Alamo Creek in Solano County. The designation of MUN was done through the tributary rule without any evaluation. A full scale evaluation was needed to justify a change in designation. The issue was that the creek did not meet any of the exceptions in the Sources of Drinking Water Policy. After a tremendous expenditure of money, the final decision was that a water body can be de-designated for MUN uses, even where the exceptions established in the Sources of Drinking Water Policy do not specifically apply. In considering de-designating Old Alamo Creek in Solano County for MUN uses, the State Water Board found the use designation inappropriate, even though none of the exceptions described in the Sources of Drinking Water Policy specifically applied. They made this finding even though Old Alamo Creek had more than 200 gallons per day of flow and was not specifically constructed to convey agriculture drainage or to collect or treat municipal wastewater or storm water. Since all of Old Alamo Creek’s natural flow had been diverted and its flow consisted almost entirely of waste discharges, the State Water Board concluded that MUN use was an inappropriate beneficial use and recommended that the Central Valley Water Board take action via a Basin Plan amendment specifically exempting Old Alamo Creek from MUN uses. The Central Valley Water Board adopted the State Water Board’s conclusions in its staff report and Basin Plan amendment de-designating MUN uses for Old Alamo Creek.

It is unfortunate that scarce resources had to be used to make such a change. Similar efforts are underway in an unnamed tributary (agricultural ditch) to Powell Slough near the City of Colusa in Colusa County. The same issue is now coming up for the City of Live Oak. This issue is likely to escalate as more and more cities try to reuse their

13 Ibid., p. 12-13
15 Ibid., p. 28.
wastewater under the State’s attempt to develop recycled water supplies to free up other higher quality supplies for other uses. Because of the cost of de-designation as establish by the Live Oak case and the Old Alamo Creek case, it is unlikely that recycled water uses can be achieved to obtain to help meet a salt balance unless other methods are used to correctly designate MUN uses in agricultural drainage and conveyance facilities.

One of the primary disconnects is that it is assumed that the agricultural conveyance facilities previously described and listed by the Central Valley Water Board in 1992 are not connected to any natural waterways but are assumed to be so and beneficial uses assigned via the tributary rule. In almost all cases where the MUN beneficial use has been reviewed and removed, the use was originally assigned via the tributary rule. The recent review of present beneficial use designation by the CV-SALTS Coalition showed that on the San Joaquin River Basin valley floor, it was impossible to show by map how or where many of the valley floor waterways were connected and therefore they could not designate which beneficial uses could be assigned by the tributary rule. This finding and the evaluation done in the Grassland watershed and the three other sloughs is consistent with the findings in the Tulare Lake Basin Water Quality Control Plan that states shows Valley Floor streams and waterways to be a separate group for beneficial use designation. The Basin Plan does not designate any waterways in the Valley Floor Waters to have the MUN beneficial use designation. This separation and specific non-designation is not however carried over to the Sacramento-San Joaquin River Basin Plan.

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Homework for CV-Salts Executive Committee

Written Responses Due at 5:00p (pdt) on Thursday, March 30th

1) Nominate a surface waterbody (lake or stream), explicitly designated MUN in the Basin Plan, that should be exempt from that designation. Explain how the waterbody meets one or more of the exemption criteria established by the state Sources of Drinking Water Policy. Identify the nearest downstream municipal water supply intake.

None noted.

2) Nominate a surface waterbody (lake or stream), not explicitly designated MUN in the Basin Plan, that should be exempt from that designation. Explain how the waterbody meets one or more of the exemption criteria established by the state Sources of Drinking Water Policy. Identify the nearest downstream municipal water supply intake.

OK, an example would be near Live Oak, CA. RD777, Laterals 1 and 2. These are constructed drains that appear to meet the plain language of the 88-63 criteria:

Surface Waters Where:

a. The water is in systems designed or modified to collect or treat municipal or industrial wastewaters, process waters, mining wastewaters, or storm water runoff, provided that the discharge from such systems is monitored to assure compliance with all relevant water quality objectives as required by the Regional Boards; or,

b. The water is in systems designed or modified for the primary purpose of conveying or holding agricultural drainage waters, provided that the discharge from such systems is monitored to assure compliance with all relevant water quality objectives as required by the Regional Boards.

In general we believe the above 88–63 criteria should be applied broadly (self-actualizing) such that individual Basin Plan Amendments are not necessary, as the default position. While these designations would not necessarily provide broad relief to dischargers for constituents in a broad based TMDL-type setting, it would allow economies of scale for regional treatment solutions, or to transport salts to less sensitive waterways. Heck, if we were ever to construct a brine conveyance this 88–63 exemption must apply for it to make sense.

In this example the nearest drinking water intakes may be Sacramento, on the Sacramento River.

3) Nominate a groundwater basin, explicitly designated MUN in the Basin Plan, that should be exempt from that designation. Explain how the groundwater basin meets one or more of the exemption criteria established by the state Sources of Drinking Water Policy. Identify the nearest municipal water supply well.

None noted, see concern in #4 below.
4) Nominate a groundwater basin (or sub-basin), not explicitly designated MUN in the Basin Plan, that should be exempt from that designation. Explain how the groundwater basin or sub-basin meets one or more of the exemption criteria established by the state Sources of Drinking Water Policy. Identify the nearest municipal water supply well. If nominating a sub-basin, describe the boundaries that will be used to delimit the relevant sub-basin from the adjacent groundwater basins and sub-basins.

None noted. We’d be concerned that any discharge to an impaired, or unuseable groundwater body could spread that unuseable water into adjacent groundwater aquifers, or even surface waters, just from the flux of the discharge….unless hydraulic pathway isolation could be demonstrated.

5) Nominate a surface waterbody, not yet named in the Basin Plan, that should be explicitly designated MUN because there is a municipal water supply intake operating in that waterbody.

None noted

6) Nominate a groundwater basin, not yet named in the Basin Plan, that should be explicitly designated MUN because there is a municipal water supply well operating in that waterbody.

None noted

7) What additional factor(s), other than those already identified in the state Sources of Drinking Water Policy, should be used to demonstrate that a waterbody is not likely to serve as a potential drinking water supply? (Example: what consideration, if any, should be given to DPH regulations when evaluating existing and potential uses?)

Maybe water rights should have some consideration, but those can change with time so it probably should not be definitive.

NOTE: the purpose of this exercise is not to develop a comprehensive or exhaustive list of all waters that should or should not be designated MUN. Rather, the purpose is to identify waters that clearly and meet the exemption criteria set forth in the Sources of Drinking Water Policy that can serve as uncontroversial reference archetypes for making subsequent MUN determinations. Nominate the most obvious example you can think of.

I’d also like to know for those who propose a particular change what exactly they hope to get from it as municipal isn’t typically the most sensitive use for many constituents of salinity (yes, nitrate is the exception)
I apologize, but due to work constraints and mandatory training I did not have time to confirm whether the water bodies I discuss are explicitly designated in the Basin Plan, or to edit my comments, which are rough. I think Reclamation is most interested in the last point on your list (with regards to the MUN designation), but I threw a couple of other points in to generate discussion.

1) Nominated a surface waterbody (lake or stream), explicitly designated MUN in the Basin Plan, that should be exempt from that designation. Explain how the waterbody meets one or more of the exemption criteria established by the state Sources of Drinking Water Policy. Identify the nearest downstream municipal water supply intake.

Segments of the lower San Joaquin River: Friant to Mendota, Mendota to Sack Dam, Sack Dam to Merced, Merced to Vernalis. Doesn’t appear to meet the exemption criteria, which don’t account for the lack of water right availability as a limiting factor in the potential beneficial use and the fact that the system has been permitted to allow drainage dominance during some seasons and especially in upstream segments (which would not have happened if it was intended to provide MUN). Nearest downstream MUNs: new City of Stockton intake, Banks/Jones pumping plants, CCWD intakes (where salt is more influenced by seawater intrusion and Sacramento River flow).

2) Nominated a surface waterbody (lake or stream), not explicitly designated MUN in the Basin Plan, that should be exempt from that designation. Explain how the waterbody meets one or more of the exemption criteria established by the state Sources of Drinking Water Policy. Identify the nearest downstream municipal water supply intake.

Ephemeral streams on the Westside of the San Joaquin River. Bypass channels for flood control releases.

3) Nominated a groundwater basin, explicitly designated MUN in the Basin Plan, that should be exempt from that designation. Explain how the groundwater basin meets one or more of the exemption criteria established by the state Sources of Drinking Water Policy. Identify the nearest municipal water supply well.

4) Nominated a groundwater basin (or sub-basin), not explicitly designated MUN in the Basin Plan, that should be exempt from that designation. Explain how the groundwater basin or sub-basin meets one or more of the exemption criteria established by the state Sources of Drinking Water Policy. Identify the nearest municipal water supply well. If
nominating a sub-basin, describe the boundaries that will be used to delimit the relevant sub-basin from the adjacent groundwater basins and sub-basins.

5) Nominate a surface waterbody, not yet named in the Basin Plan, that should be explicitly designated MUN because there is a municipal water supply intake operating in that waterbody.

6) Nominate a groundwater basin, not yet named in the Basin Plan, that should be explicitly designated MUN because there is a municipal water supply well operating in that waterbody.

7) What additional factor(s), other than those already identified in the state Sources of Drinking Water Policy, should be used to demonstrate that a waterbody is not likely to serve as a potential drinking water supply? (Example: what consideration, if any, should be given to DPH regulations when evaluating existing and potential uses?)

Consideration should be given to existing water rights and to segments that are fully allocated, do not have existing MUN uses, and therefore are not expected to have MUN uses added in future.

Also, salinity is a “contaminant” that can be addressed at any time through flow remanagement (since flow is likely a big part of this issue in San Joaquin basin), so why spend the money and resources (water) to protect a potential use now when the basin can adapt if drinking water becomes the highest priority or needs to become an existing use (treatment plants also take time to build)- similar to the current examination by the SWRCB of shifting the basin to a fish-priority paradigm.

Upstream/downstream not necessarily correlated in lower SJR and Delta (i.e. do not assume that a downstream MUN requires that upstream be designate MUN or that upstream MUN carries over to downstream MUN).

For MUN, water reliability and availability (and some consistent base flow) is just as important as quality. In this respect, river segments upstream of Sack Dam present significant challenges. (i.e. recognize the role of tributaries along a river segment.)

And yes, DPH regulations should be considered when evaluating/designating existing and potential MUN uses (DPH requirements to use a source as drinking water), as well as in consideration of water quality objectives – some trade off between source water and treatment costs should be evaluated.

NOTE: the purpose of this exercise is not to develop a comprehensive or exhaustive list of all waters that should or should not be designated MUN. Rather, the purpose is to identify waters that clearly and meet the exemption criteria set forth in the Sources of Drinking Water Policy that can serve as uncontroversial reference archetypes for making subsequent MUN determinations. Nominate the most obvious example you can think of.
March 31, 2011

Doug Davis
Tulare Lake Drainage District
P.O. Box 985
Corcoran CA 93212

Mark Gilkey
Tulare Lake Basin Water Storage District
1001 Chase Ave
Corcoran CA 93212

SUBJECT: MUN Declassification-Historic Tulare Lake Bed
Kings and Kern Counties CA

Gentlemen:

I am responding to the CV-SALTS Executive Committee homework assignment regarding the nomination of a groundwater basin that is explicitly designated MUN in the Basin Plan that should be exempt from that designation. The Tulare Lake Drainage District (TLDD) and the Tulare Lake Basin Water Storage District (TLBWSD) believe the Basin Plan should be amended to delete the MUN classification in the area commonly known as the Tulare Lake Bed in which TLBLWSD and TLDD operate. More specifically, a drawing of that area is attached as Figure 1.

The Tulare Lake is a natural geologic feature which resulted from runoff, primarily from the Sierras to the north and east, accumulating in a closed depression on the floor of the Central Valley with a very dense underlying clay layer. Prior to construction of dams on the tributary streams, the area was a seasonal shallow lake bed. After the construction of dams, the lake bed is extensively farmed and is one of the most productive growing regions in the State. Since this site is a closed basin, the surface runoff is contained. The salts brought in with the tributary flows and runoff over geologic time concentrated the natural salinity as the water was evaporated off. Although the conversion to more extensive farming has made some changes to the local grading and drainage patterns so that conventional irrigation practices may be employed, the drainage features of the land remain unchanged as a closed basin.

Another predominant natural feature of the Tulare Lake is the thick accumulations of clay layers which have built up over geologic time. The runoff from the mountains obviously contained a mixture of gravel, sand, silt and clay. As the runoff slowed down in its approach to Tulare Lake, the gravel and sand dropped out and formed river features. The silts and clays made it all the way to Tulare Lake, where the water was evaporated out. The clays and silts built up in massive thicknesses as shown in the Geologic
Cross Section, Figure 3. There are five large scale clay layers termed the A-Clay through the F-Clay known to exist, the largest being the E-Clay (also known as the Corcoran Clay). Within the area proposed for this study, the clay layers are typically 750 to 1500 feet thick. The high salinity groundwater, that is the result of confined basin and evaporation over geologic time, sits on top of and throughout the A-Clay through the E-Clay.

Attached is Figure 2 showing the Tulare Lakebed area and the depth to first groundwater (first waters encountered) according to the State Department of Water Resources for 2008, the most recent year available. The depth to these waters is less than 10 feet. Also added to Tulare Lakebed area in Figure 1 are the electrical conductivities in the shallow groundwater previously determined by DWR; those conductivities are clearly unsuitable for domestic or municipal supply (or agricultural either).

Individual sites within the Tulare Lakebed area have been tested by the undersigned over recent years and confirm the extremely high conductivities determined by DWR. For instance, a wastewater discharge operation just south and west of the City of Corcoran was permitted by the Regional Board after it was shown that individual readings as high as 8000 micromhos with the upper confidence level of the conductivity of the natural groundwater at 10,000 micromhos. In another instance, pre-construction readings of the natural groundwater before operating ponds on the northern rim of the former Tulare Lakebed showed individual readings as high as 35,000 micromhos with the upper confidence level of the conductivity of the natural groundwater as 38,000 micromhos. In a third instance, pre-construction readings of the natural groundwater near the southern rim of the former Tulare Lakebed showed individual readings as high as 95,000 micromhos with the upper confidence level of the conductivity of the natural groundwater as 102,000 micromhos. In each of these specific instances, the site data was as high or higher than the data presented by DWR.

The farmers in the Tulare Lakebed have searched for usable groundwater for years. Many test wells and much effort has been expended. Simply put, no suitable groundwater has been found within several thousand feet of the surface.

The lack of usable groundwater is reflected by the fact the irrigation wells are all located in well fields on the fringe of the historic lakebed footprint. There are no communities or homes in the lakebed, due to the lack of groundwater and potential flooding. The Tulare Lakebed is surrounded by some small rural communities (i.e. Corcoran, Alpaugh, Stratford and Kettieman City) which are located where the first usable groundwater can be found. Note that these communities are in areas which are upslope of the Tulare lakebed and the groundwater nonetheless is marginal, requiring extensive treatment for natural constituents to provide a safe, potable public water supply. The lower lying land encircled by these communities and constituting the Tulare Lakebed is not suitable for development. The groundwater in the region flows anyway from the communities toward the lakebed. The shallow groundwater in the lakebed does not flow toward the communities and thus does not pose a risk to a domestic supply.

Drinking water policy in California for groundwater has typically focused on two main aspects – quantity and quality. The absolute minimum for quantity is that the groundwater must be found in a consistent volume that is sufficient to supply for a single residence, that amount being on the order of several gallons per minute. That is not a lot of water. The A-Clay through F-Clay layers in this study area would not produce that much. So the quantity issue is not proposed to be addressed in this study.
The quality issue for purposes of drinking water will be addressed. The fine point of the policy is that the groundwater must be present in a quality that is reasonably treatable to potable water standards, not necessarily that it meet potable water standards directly. Although the relevant drinking water standard for total dissolved solids is 500 parts per million, anything up to a TDS of 3000 ppm is considered treatable to drinking water standards and therefore part of the MUN area. Implied is that about 85% of the salts can be reasonably removed by treatment. A similar argument for conductivity is present. Given the known data, it is believed the first waters encountered are at level that do not support a MUN designation.

I have previously provided you a proposal to do the conductivity testing that is consistent with the historical DWR testing. The conductivity cutoff for not being treatable in the State policy is 5000 micromhos.

In summary, the TLDD and the TLBWSD nominates the Tulare Lakebed area for MUN declassification because the basin is a closed basin, is underlain by massive clay strata which separates the shallow saline groundwater from any deeper groundwaters, has very high natural saline groundwater, has very shallow groundwater, has a long history of no usable groundwater found within several thousand feet of the surface, has no domestic development, the neighboring communities are all upslope of the lakebed, and the groundwater exceeds the salinity level that is even reasonably treatable to meet public water supply criteria.

If you have any questions or comments in this regard, please do not hesitate to contact me.

Yours truly

John Minney, CE 32537, GE 602, REA 00212

jmm/bf

Attachments:  Figure 1, Tulare Lakebed Area with Conductivities Determined by DWR Added

Figure 2, DWR Shallow Groundwater Areas with Tulare Lakebed Area Added

Figure 3, Regional Geologic Cross Section with Tulare Lakebed Area Added
March 17, 2011

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Mark Gilkey
Tulare Lake Basin Water Storage District
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SUBJECT: Study Proposal
MUN Declassification-Historic Tulare Lake Bed
Kings and Kern Counties CA

Dear Sir:

Tulare Lake Drainage District and Tulare Lake Basin Water Storage District would like to apply for a grant to recover costs associated with defining the shallow groundwater areas within their general service area that are not suitable for municipal supply.

The State has originally classified large tracts of land in the general footprint of the historic Tulare Lake bed as suitable for municipal supply as a default position. In other words, absent compelling information to the contrary that the groundwater is not suitable for municipal use, it was assumed to be suitable. A large portion of the lake bed was therefore classified as MUN under this rationale. The Tulare Lake Basin Water Storage District and the Tulare Lake Drainage District have requested a study proposal to gather the necessary technical information on the first waters encountered in the region in order to determine if the MUN designation should be changed.

TECHNICAL PROPOSAL

I have prepared a review of known groundwater conditions within the general area of the historic Tulare Lake Bed and outlined a scope of work to address declassification of the shallow groundwater from the MUN classification. Tulare Lake was an evaporative lake that preceded development in this area. It is situated in a closed basin with no outlet to the sea. See Figure 1.

A typical cross section through this area shows a predominance of clay soils to great depth. The major clay strata are termed the A-Clay through the F-Clay. The E-Clay is also known as the Corcoran Clay.
Detailed studies of municipal groundwater sources in the Corcoran area have reached the conclusion that usable groundwater for municipal wells is located only east of Highway 43 or below the E-Clay. The E-Clay is typically located at this site from a depth of about 500 to 700 feet. There is typically 200-400 feet of massive clay deposits between the ground surface and the depth at which any beneficially usable groundwater can be found.

State Water Resources Control Board Resolution 88-63, as amended, states in part

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 Boards, with the exception of:

1. Surface and ground waters where:
   a. The total dissolved solids (TDS) exceed 3,000 mg/L (5,000 uS/cm, electrical conductivity) and it is not reasonably expected by Regional Boards to supply a public water system, or
   b. There is contamination, either by natural processes or by human activity (unrelated to the specific pollution incident), that cannot reasonably be treated for domestic use using either Best Management Practices or best economically achievable treatment practices, or
   c. The water source does not provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day.

It is common knowledge in the former Tulare Lake Bed area that the shallow groundwater (first waters encountered) exceeds the TDS and Ec criteria cited above. Figure 12 is a plot made by the Department of Water Resources of the conductivity values in this general region. It clearly shows that the groundwater would be expected to exceed the criteria in 88-63.

I have extensive data on file for various sites which roughly span the extent of Tulare Lake Bed. The site located in the northern region, T21S R21E, has exhibited a shallow background conductivity of 20,375 micromhos. The site located in the southern region, T24S R22E, has exhibited a shallow background conductivity of 25,570 micromhos. Another site located in the southern region, T24S R22E and T24S R21E, has exhibited a shallow background conductivity of 51,523 micromhos. Since the three sites are located at the outer edges of the former Tulare Lake, it is reasonable to expect as poor quality groundwater inside the middle of the district.

Previous evaluation of electric logs from the Tulare Lake Bed indicates that the Total Dissolved Salts (TDS) in the shallow groundwater is over 5,000 mg/l.

The Tulare Lake Drainage District and the Tulare Lake Basin Water Storage District propose to perform further testing in order to confirm the declassification from the MUN classification is warranted. We propose a sampling grid of approximately 125 groundwater samples within Tulare Lake Bed, see Figure 1. The sampling grid varies from one to three miles. Samples would be collected from a depth of 20 feet using a State licensed drilling contractor. Testing would consist of electrical conductivity by a State certified lab. I will be involved in the preparation of the findings report. I am a
licensed civil engineer, licensed geotechnical engineer, registered environmental assessor and licensed C-57 drilling contractor.

COST ESTIMATE

The following table presents the estimated costs for completion of the above described work.

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If you have any questions or comments in this regard, please do not hesitate to contact me.

Yours truly,

John Minney
CE 32537
GE 602
REA 00212

jmmb/ff
Enclosures:  Figure 1: Map of Tulare Lake Bed Area with proposed test locations
Figure 12: Electrical Conductivity in Shallow Groundwater (1984-1989)