CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

AMENDMENT TO THE WATER QUALITY CONTROL PLAN FOR THE SACRAMENTO RIVER AND SAN JOAQUIN RIVER BASINS

TO

DEDESIGNATE FOUR BENEFICIAL USES FOR OLD ALAMO CREEK

Draft Staff Report

April 2005

State of California

California Environmental Protection Agency

REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

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TABLE OF CONTENTS

APPENDICES

ACRONYMS AND ABBREVIATIONS

Basin Plan	*Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition - 1998*
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CFS	Cubic feet per second
CTR	California Toxics Rule
CWA	Clean Water Act
CWC	California Water Code (Porter-Cologne Water Quality Control Act)
Delta	Sacramento-San Joaquin Delta
DHS	California Department of Health Services
ESA	Endangered Species Act
FR	Federal Register
mgd	million gallons per day
NOAA Fisheries	National Oceanic and Atmospheric Administration Fisheries
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
OAL	Office of Administrative Law
PRC	Public Resources Code
Regional Board	Regional Water Quality Control Board, Central Valley Region
State Board	State Water Resources Control Board
TDS	total dissolved solids
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
WWTP	wastewater treatment plant

1 INTRODUCTION

The purpose of this Staff Report is to provide the rationale and supporting documentation for proposed amendments to the "Water Quality Control Plan for the Sacramento and San Joaquin River Basins, Fourth Edition (1998)." This section provides the regulatory context for basin planning.

1.1 REGULATORY AUTHORITY AND MANDATES FOR BASIN PLAN AMENDMENTS

The State Board and the nine Regional Water Quality Control Boards (regional boards) are the principal state agencies with primary responsibility for coordination and control of water quality. (California Water Code (CWC) 13000). Each regional board is required to adopt a water quality control plan, or basin plan, which provides the basis for regulatory actions to protect water quality. (CWC 13240 et seq.). Basin plans consist of beneficial uses of water, water quality objectives to protect the uses, and a program to implement the objectives. (CWC 13050(j)). Basin plans, once adopted, must be periodically reviewed and may be revised. (CWC 13240).

Under the federal Clean Water Act, 33 U S C. section 1251 et seq., (CWA) the states are required to adopt water quality standards for surface waters. (CWA 303(c)). Water quality standards consist of 1) designated uses; 2) water quality criteria necessary to protect designated beneficial uses; and 3) an antidegradation policy. (CWA 303(c)(2)(A) and (d)(4)(B); 40 C.F.R. 131.6). In California, water quality standards are found in the basin plans and statewide water quality control plans adopted by the State Water Resources Control Board (State Board). State water quality objectives are synonymous with criteria under CWA section 303(c). Under the CWA, the states must review water quality standards at least triennially.

Regional boards adopt and amend basin plans through a structured process involving peer review, public participation and environmental review. Regional boards must comply with the California Environmental Quality Act (CEQA) (Public Resources Code (PRC) Section 21000 et seq.) when amending their basin plans. The Secretary of Resources has certified the basin planning process as exempt from the CEQA requirement to prepare an environmental impact report or other appropriate environmental document. (PRC 21080.5; Cal. Code Regs., tit. 14, §15251(g)). Instead, State Board regulations on its exempt regulatory programs require the regional boards to prepare a written report and an accompanying CEQA Environmental Checklist and Determination with respect to Significant Environmental Impacts (CEQA Checklist). (Cal. Code Regs., tit. 23, §3775 et seq.).

Basin plan amendments are not effective until they are approved by the State Water Resources Control Board (State Board) and the regulatory provisions are approved by the state Office of Administrative Law (OAL). The United States Environmental Protection Agency (USEPA) also must review and approve amendments that add or modify water quality standards for waters of the United States.

1.2 BASIN PLAN FOR THE SACRAMENTO AND SAN JOAQUIN RIVER BASINS

The Regional Board first adopted the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins in 1975. In 1989 and 1994, the Regional Board adopted major updates resulting in subsequent editions. The current edition (Fourth Edition, 2004) incorporates all new amendments approved since 1994.

1.3 DESIGNATED BENEFICIAL USES

In general, federal water quality standards regulations require that "existing" beneficial uses of water be designated for protection. "Existing" uses are defined as uses that were attained on or after 28 November 1975. (40 C.F.R. §131.3(e). An existing use is established if the use has been actually attained or the water quality necessary to support the use is in place, even if the use itself is not currently established, unless physical factors prevent attainment of the use. (USEPA's Questions and Answers on Antidegradation, Question 7, included as App. G to USEPA's Water Quality Standards Handbook (2nd ed. 1993)).

Designated uses include both existing uses and potential uses, i.e. uses that have not yet been attained. (40 C.F.R. §131.3(f)). In Table II-1 of the Basin Plan, beneficial uses for listed water bodies within the Sacramento and San Joaquin River basins are identified as either Existing or Potential.

For tributary streams that are not listed in Table II-1, the Basin Plan states that "[t]he beneficial uses of any specifically identified water body generally apply to its tributary streams." (Basin Plan at II-2.00). The Basin Plan states, however, that in some cases, the beneficial use may not be applicable to the entire water body and that the uses for unidentified waters will be evaluated on a case-by-case basis. (Id.) The Basin Plan also provides that water bodies that are not listed in Table II-1 are assigned municipal and domestic supply (MUN) as a beneficial use in accordance with State Board Resolution No. 88-63, commonly referred to as the "Sources of Drinking Water Policy."

1.4 PROPOSED AMENDMENT

Old Alamo Creek is not listed in Table II-1 of the Basin Plan. Old Alamo Creek is a tributary stream of the Sacramento-San Joaquin Delta. Both the Basin Plan and the State Board's Water Quality Control Plan for the San Francisco Bay-San Joaquin Delta Estuary (Bay-Delta Plan) designate uses for the Delta. These include, among others, MUN; cold freshwater habitat (COLD); migration of aquatic organisms (MIGR); and spawning, reproduction and/or early development (SPWN). (Appendix A contains definitions for these uses from the Basin Plan.) Under the Basin Plan's tributary streams language, these uses are assigned to Old Alamo Creek. Because Old Alamo Creek is not listed in Table II-1, the Basin Plan provision implementing State Board Resolution No. 88-63 also separately assigns MUN to Old Alamo Creek.

Regional Board staff proposes an amendment to the Basin Plan that will dedesignate the four beneficial uses, MUN, COLD, MIGR, and SPWN, listed above for Old Alamo

Creek in Solano County. These uses are not existing, and this report concludes that the uses cannot be feasibly attained in the future.

2 EXISTING CONDITIONS

2.1 OLD ALAMO CREEK

Old Alamo Creek originally was the downstream portion of Alamo Creek. (Tetra Tech, 2004. Figure [2-2].) As part of Soil Conservation Service (now the Natural Resources Conservation Service, NRCS) flood control efforts, the channel known as New Alamo Creek was built in the mid-1960s. Alamo Creek was diverted into New Alamo Creek in 1966. (Vacaville, Final Environmental Impact Report, v. II, p. [4.3-6]–[4.3-7].) Diverting the flow left Old Alamo Creek dry for much of the year except for the section downstream of Vacaville's Easterly Wastewater Treatment Plant (EWWTP). The EWWTP currently discharges approximately 6-8 million gallons per day (mgd) in average dry weather flows. (CVRWQCB Order 5-01-044. p. 2.) Old Alamo Creek also conveys urban stormwater runoff, effluent from a Kinder-Morgan, LLP groundwater remediation project and agricultural returns. A portion of Old Alamo Creek, downstream from the discharge point, was straightened to control flooding. However, much of Old Alamo Creek has not been significantly modified compared to other sections of the creek, nor has it been structurally modified to collect and convey wastewater or agricultural return water. (Tetra Tech, 2004. p. 2-2.)

Approximately 3.2 miles downstream from Vacaville's discharge, Old Alamo Creek enters New Alamo Creek through a set of iron flap gates. (Old Alamo Creek Photographs. Aerial photograph 7, ground photographs 31, 32.) After another 3.3 miles, New Alamo Creek empties into Ulatis Creek. The confluence of New Alamo and Ulatis Creeks is within the legal boundary of the Sacramento-San Joaquin Delta. Ulatis Creek joins Cache Slough 6.7 miles downstream from New Alamo Creek. Within Cache Slough is an emergency drinking water intake for the City of Vallejo that has not been used since 1992. In addition, the Department of Health Services did not include Cache Slough in the City of Vallejo's current Domestic Water Supply Permit No. 02-04-97P-4810007 as an approved source of supply water. (CVRWQCB, Order 5-01-044. p. 6.)

3 RATIONALE

3.1 Purpose and Regulatory Need For the Proposed Basin Plan Amendment

This amendment dedesignates COLD, MIGR, SPWN, and MUN as beneficial uses for Old Alamo Creek.

3.2 Requirements For DeDesignation

USEPA's water quality standards regulations allow a state to dedesignate a use that is not existing or subcategorize a use if the state demonstrates that attaining the use is not feasible for one of the following reasons:

1) Naturally occurring pollutant concentrations prevent the attainment of the use; or

2) 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; or

3) 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; or

4) Dams, diversions, or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in the attainment of the use; or

5) Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality preclude attainment of aquatic life protection uses; or

6) Controls more stringent than those required by Sections 301(b) and 306 of the Clean Water Act would result in substantial and widespread economic and social impact. (40 CFR 131.10(g).)

In addition, the regulations establish special protections for CWA section 101(a)(2) uses, which are referred to as "fishable/swimmable" uses. In order to dedesignate, subcategorize, or not designate these uses, the state must support its demonstration of infeasibility with a use attainability analysis. (40 CFR 131.10(j).) A use attainability analysis, or UAA, is a structured scientific assessment of the factors affecting attainment of the use, which may include physical, chemical, biological, and economic factors. (40 CFR 131.3(g).)

3.3 SCIENTIFIC JUSTIFICATION

This amendment is primarily based on work performed by Tetra Tech, Inc. In 2002, USEPA contracted with Tetra Tech, Inc. to evaluate whether COLD, MIGR, MUN and SPWN are currently attained or are feasibly attainable in Old Alamo Creek. Tetra Tech produced a report, “Use Attainability Analysis for Old Alamo Creek,” in January 2004 detailing its findings. That report serves as the primary basis for this analysis. As the lead contractor for this work, Tetra Tech, Inc. provided expertise in collecting and analyzing data relevant to aquatic life uses and MUN. The final interpretation and application of Tetra Tech’s data and report in the basin plan amendment process is the responsibility of Regional Board staff. This report reflects the analysis of Regional Board staff.

3.3.1 Tetra Tech Study Results

Tetra Tech, in cooperation with Robertson-Bryan, Inc., collected data on Old Alamo Creek’s physical and chemical characteristics to determine if there was any potential for aquatic life protected by COLD, MIGR and SPWN uses to exist. These data allowed Tetra Tech to calculate Habitat Suitability Indices (HSI) for aquatic organisms in various life stages including Rainbow and Steelhead trout (*Oncorhynchus mykiss*), Chinook salmon (*Oncorhynchus tshawytscha*) and certain warm water fish species.

HSI scores range from 0 to 1. Optimal habitats are 1 and unsuitable habitats are 0. Scores of 0.3 or less indicate poor conditions. (Tetra Tech, 2004. pp. [4-5]-[4-6].) HSI scores may be calculated for different life stages including eggs, larvae, fry, juvenile and adult. HSI scores are most useful when evaluating COLD and SPWN uses. For MIGR, physical barriers and other hydrologic modifications are the most important factors.

In addition to the HSI work, Tetra Tech conducted fish surveys in August 2002 and January 2003 and examined historic records of cold water species in Solano County. The National Marine Fisheries Service (NOAA Fisheries), California Department of Fish and Game (CDFG), Dr. Peter Moyle from the University of California - Davis (UC Davis) and Regional Board staff provided records and background information to Tetra Tech.

Tetra Tech also examined whether MUN is an existing use for Old Alamo Creek. They looked for evidence that anyone was currently using Old Alamo Creek as a municipal or domestic supply or had plans to do so in the future. Their survey looked for intake pipes or other devices that would demonstrate offstream use. Tetra Tech also interviewed staff from the Regional Board, Vacaville and the Solano Irrigation District in addition to local residents. (Tetra Tech, 2004. p. [8-1].)

3.3.1.1 COLD (cold freshwater habitat)

Tetra Tech did not find any indication that COLD is an existing use in Old Alamo Creek. HSI scores for COLD, based on Old Alamo's suitability for rainbow trout, indicate that habitat is often marginal and generally unsuitable for embryonic, fry, juvenile and adult salmonid life stages. (Tetra Tech, 2004. p. [5-10], Table [5-3].) Fish sampling did not reveal the presence of cold water salmonid species, nor is it probable that cold water salmonids would be perennial inhabitants of Valley floor streams, like Old Alamo Creek, due to the temperatures found in these streams in the Spring, Summer and Fall. (Tetra Tech, 2004. Table [4-5]; p. [5-14].) However, three-spine stickleback were observed in Old Alamo Creek. The Tetra Tech study characterized three-spine sticklebacks as warm water fish, although Moyle notes that they prefer "cool water" but defines that as temperatures less than 23 degrees Celsius, embryos hatching in water with temperatures from 18 to 20 degrees Celsius. (Moyle, 2002. pp. 341-342) Obligate cold water aquatic insects are not known to be present in Solano County and were not expected to be present due to the temperature regime in Old Alamo Creek. (Tetra Tech, 2004. pp. [5-1]-[5-3], [5-14].)

Tetra Tech determined that COLD is not a feasibly attainable use due to unsuitable physical conditions (40 CFR 131.10(g)(5)) and hydrologic modifications (40 CFR 131.10(g)(4)). (Tetra Tech, 2004. pp. [4-2] and [5-12], Table [4-3], p. [5-14].) By virtue of its location, which is entirely on the Central Valley floor, it is doubtful that COLD would be attainable even under historic conditions. (Tetra Tech, 2004. p. [5-14].) Native substrates and the influence they have on the lack of riffles and pools make Old Alamo Creek inhospitable for cold freshwater species. Section 3.3.2.3 provides further discussion.

Hydrologic modifications made by NRCS in the mid 1960's disconnected lower Alamo Creek from its upper watershed. In addition, a flap gate was installed between Old and New Alamo Creeks. This work was intended to control floods. (Vacaville, 1998a. pp. [4.3-1], [4.3-6]-[4.3-7].) NRCS also removed vegetation and straightened the lower reaches to maximize conveyance capacity. (Old Alamo Creek Photographs. Aerial photograph 6, Ground photographs 26-30.) Local irrigation and water districts maintain these modifications today. Removing the connection to the upper watershed while devegetating and realigning the lower portion allowed temperatures to rise and left the creek effluent dominated. Accordingly, lower Old Alamo Creek has the lowest habitat scores of the entire creek. (Tetra Tech, 2004. p. [5-9]-[5-10].) Section 3.3.2.2 provides further discussion.

3.3.1.2 MIGR (migration of aquatic organisms)

Tetra Tech also found that MIGR is not an existing use of Old Alamo Creek. (Tetra Tech, 2004, pp. [6-1]-[6-5].) NOAA Fisheries, CDFG and other sources had no information demonstrating the presence of migratory fish in Old Alamo Creek. (Tetra Tech, 2004, p. 6-2.) Hydrologic modifications (40 CFR 131.10(g)(4)) prevent MIGR from being attainable. Iron flap gates at the confluence of Old Alamo and New Alamo Creeks prevent migratory fish from entering the creek. Additionally, the lack of a connection to the upper watershed prevents migratory fish from reaching areas that are suitable for foraging or spawning. Section 3.3.2.2 provides further discussion.

3.3.1.3 SPWN (spawning, reproduction and/or early development)

Like COLD and MIGR, Tetra Tech found SPWN is not an existing use of Old Alamo Creek. There are no known occurrences of anadromous fish spawning in Old Alamo Creek. (Tetra Tech, 2004, p. [7-1].) HSI scores rating the potential for anadromous cold water fish to spawn are generally less than 0.3 due to poor substrates indicating spawning habitat does not exist in a meaningful way. In terms of warm water anadromous fish, the Basin Plan considers Striped bass (Morone saxatilis), Shortnosed sturgeon (Acipenser brevirostrum) and American shad (Alosa sapidissima). Species-specific HSI scores demonstrated that Old Alamo Creek would not be suitable spawning habitat for Striped bass or Shortnosed sturgeon. (Tetra Tech, 2004. Table [7–1].) Tetra Tech found that Old Alamo Creek could support spawning shad with respect to this species' flow and temperature requirements. Old Alamo Creek's total physical habitat scores, however, are 63% or less of optimal levels. Most are below 50% of optimal. (Tetra Tech, 2004. Table [4-4].) American shad prefer sand and gravel substrates in areas with sufficient current velocity to remove silt. (Tetra Tech, 2004. p. [7-3].) Since natural silt and fine sand substrates dominate all locations Tetra Tech examined, Old Alamo Creek would not be expected to provide suitable shad spawning habitat, even without human influence. (Tetra Tech, 2004. Table [4-3].) The Tetra Tech analysis was based on flows collected during the time of the year that shad or sturgeon would not be expected to use the water body. Shad spawning is expected to occur from late March to early July according to Moyle (2002, p. 118): "The first mature shad of each year's run appear in autumn in the lower portion of the estuaries, where they gradually adjust to low salinities. They do not move into fresh water until March-May, when water temperatures exceed 14˚C. Peak runs and spawning usually occur at higher temperatures, 17-24˚C in the Sacramento River. This means the first shad, usually unripe males, appear in late March or early April, but large runs are not seen until late May or early June. The runs become smaller again when water temperatures exceed 20˚C, and few adults are seen after the first week of July." Moyle (2002, p 108) describes sturgeon spawning as occurring from late February to June, "When ready to spawn, sturgeon migrate upstream, although some movement to the lower reaches of rivers may take place in winter months prior to spawning. Spawning takes place between late February and early June when water temperatures range from 8 to 19˚C, generally peaking around 14˚C (18). Mature fish apparently start moving upstream in response to increases in flow, and spawning seems to be triggered by a pulse of high flow." As described, shad and sturgeon spawning is expected to occur from late March to early July and late February to early June, respectively, but Tetra Tech did not analyze any velocity data for that period of time.

The City of Vacaville submitted an "Effluent Disposal Plan for Easterly Wastewater Treatment Plant" in June 1992 in which they presented the results of dye studies conducted monthly over a one-year period from November 1990 to October 1991. Rainfall during this period was significantly less than average except for March 1991 when the rainfall was about three times higher than the average March rainfall for the area and February 1991 and April 1991 when rainfall was the same as average rainfalls. (CDEC, 2005) The results include data on how long it took for dye released that the wastewater plant to arrive at the Vallejo Pumping Plant located about 20 miles downstream. The path from the Vallejo Pumping Plant to the wastewater plant would be the same route taken by anadromous species in order to reach Old Alamo Creek. Velocities within individual reaches of the 20-mile stretch may vary from the average of the whole stretch due to variations in channel configuration. The arrival times of the dye at the Vallejo Pumping Plant after release of the dye from the wastewater plant during the shad spawning period of March to July, were from 90 to 240 hours. Calculated velocities ranged from 0.12 to 0.33 ft/sec (note that the March rainfall was significantly higher than the average rainfall so these velocities should be representative of a better than normal situation). These velocities are considerably less than the minimal conditions identified in the Tetra Tech analysis and shows that the water bodies from the wastewater plant to the Vallejo Pumping Plant are unsuitable for shad spawning. During the sturgeon spawning period of February to June, arrival times of the dye at the Vallejo Pumping Plan were from 40 to 160 hours. Calculated velocities ranged from 0.18 to 0.73 ft/sec. These velocities provide minimal habitat conditions for sturgeon spawning. Additional consideration for sturgeon spawning is the temperature requirements. According to the Tetra Tech analysis, minimal spawning habitat requires temperatures of 8 to 17˚C. However, even though the flows were about 0.7 ft/sec in February 1991, the temperature was above 18˚C in February 2002 (Tetra Tech, 2004. p 4-3, Figure 4-3). Therefore, Old Alamo Creek is unsuitable for sturgeon and shad spawning due primarily to the flows, and, for the sturgeon, the temperature.

A combination of hydrologic modifications (40 CFR 131.10(g)(4)) and unsuitable physical conditions (40 CFR 131.10(g)(5)) prevent SPWN from being feasibly attainable. (Tetra Tech, 2004. p. [7-8].) SPWN applies to both cold and warm water anadromous fish. In order for anadromous fish to successfully spawn in Old Alamo Creek, habitat would have to be sufficient for egg, larval and some juvenile life stages. For cold water species and some warm water species, this would require different substrates, more pools and riffles and more riparian cover. Some parameters such as substrate type and the lack of pools and riffles are part of Old Alamo Creek's natural features. (Tetra Tech, 2004. p. [5-14].) Disconnecting and channelizing Old Alamo Creek and eliminating riparian cover further exacerbated this situation. (Tetra Tech, 2004. p. [7-8].) Sec-tions 3.3.2.2 and 3.3.2.3 provide further discussion.

3.3.1.4 MUN (municipal and domestic supply)

There is no evidence that anyone has used Old Alamo Creek as a municipal or domestic supply and there are no indications that anyone has plans to do so. (Tetra Tech, 2004. pp. [8-1]-[8-2].) Downstream from Vacaville's outfall, where flows become perennial, available nitrate and total dissolved solids data demonstrate that Old Alamo Creek has not been of sufficient quality to be a municipal or domestic supply. (Tetra Tech, 2004. p. [8-4]; Table [8-3]; Table [8-2].)

A combination of hydrologic modifications (40 CFR 131.10(g)(4)) and the resulting ephemeral, intermittent or low flows (40 CFR 131.10(g)(2)) prevents MUN from being attained. The absence of a connection to Alamo Creek and its historic watershed created a situation where Old Alamo Creek lacks native flows that are sufficient to serve as a municipal or domestic supply. (Tetra Tech, 2004. pp. [8-3]-[8-4].) Sections 3.3.2.1 and 3.3.2.2 provide further discussion.

3.3.2 Feasibility Analysis

To dedesignate a potential use, the states must demonstrate that it is not feasible to attain the use as a result of one of the six factors listed in section 3.2 of this report. This section examines whether it is feasible to correct the conditions that prevent Old Alamo Creek from attaining COLD, MIGR, MUN and SPWN. Low flows (40 CFR 131.10(g)(2)) play a role in preventing MUN from being attainable. Hydrologic modifications (40 CFR 131.10(g)(4)) play a partial role in preventing COLD, MIGR, MUN and SPWN from being attainable. Unsuitable natural physical conditions (40 CFR 131.10(g)(5)) also prevent COLD and SPWN from being attainable.

3.3.2.1 Low flows

In order to rely on low flows to explain why a use is not attainable, 40 CFR 131.10(g)(2) requires a demonstration that releasing additional effluent will not allow the use to be attained. In this case, releasing more effluent will not allow MUN to be attained. As explained below, Old Alamo Creek is considered an extremely impaired source for direct potable use. It is highly unlikely that the creek will be allowed to be used for drinking water in the future due to quality concerns and the general lack of public acceptance of direct potable use of what is largely treated effluent.

Historically, the intact Alamo Creek system likely exhibited some seasonality in its flow regime if not true ephemerality. While ephemeral and intermittent low-flowing streams are quite common in the Central Valley and may be an important source of drinking water for downstream areas, waters originating on the valley floor are located low in the watershed and likely make up an insignificant part of downstream drinking water supplies. The current watershed of Old Alamo Creek is approximately 7% of what it was historically. (Tetra Tech 2004. p. [8-6].) Flow data from November 2002 to April 2003, a period of the year expected to exhibit the greatest flows because of rainfall, revealed that Old Alamo Creek, upstream of the wastewater treatment plant, has no flow 69% of the time and low (<1 cubic foot per second, cfs) or no flow 76% of the time. (Tetra Tech, 2004, Table 8-1.) Similarly, a long-term model for the creek predicts that, at best, flows will be 1 cfs or less 61% of the time (222 days/year). (Tetra Tech, 2004, Table 8-2.) Pumping the residual, non-flowing water in Old Alamo Creek's channel for domestic use, if feasible, would provide a miniscule supply at best. An analysis of groundwater inputs was unable to demonstrate a measurable contribution. A 1988 study indicated Old Alamo Creek contributes to an elevated water table. Further analysis implied the elevated water table contributed flows to Old Alamo Creek. (Vacaville, 1998a. pp. [4.3-4]-[4.3-5].) The only way to reliably increase base flows would be to reestablish a connection with Alamo Creek. Section 3.3.2.2 discusses the feasibility of a reconnection.

Storage is possible as is evidenced by the pond near Elmira and Meridian Roads. (Old Alamo Creek Photographs. Aerial photograph 3, Ground photograph 17.) This pond, however, is filled with on-site agricultural tailwater rather than off-site flows originating upstream. The property owner rediverts this stored tailwater for irrigation. (Vacaville, 2001. p. 4.)

Once Old Alamo Creek was separated from upper Alamo Creek, the remaining flows were primarily sewage treatment plant effluent, irrigation returns and urban runoff. The current “headwaters” consist of flows from a storm drain that collects rainfall from a baseball diamond in Vacaville’s Eleanor Nelson Park. (Old Alamo Creek Photographs. Aerial photograph 1, Ground photographs 6 and 7.) Downstream from this point inputs are from neighborhood storm drains. (Old Alamo Creek Photographs. Aerial photograph 1, Ground photograph 9.) The next sources of water in Old Alamo Creek are some agricultural returns and the Kinder-Morgan groundwater cleanup operation in Elmira. The groundwater cleanup supplies approximately 50 gallons per minute to the stream and is expected to cease before 2010. (Vacaville, 1998a. p. [4.3-24].) Downstream of the Kinder-Morgan discharge, urban runoff from Elmira enters the stream. (Old Alamo Creek Photographs. Aerial photograph 4, Ground photograph 18.) Following Elmira’s inputs is the main source of permanent flows, Vacaville’s EWWTP. (Old Alamo Creek Photographs. Aerial photograph 4, Ground photograph 19.)

California Department of Health Services, 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 returns and urban runoff from being a municipal or domestic supply. DHS has developed a policy, however, on what it terms “Extremely Impaired Sources.” (DHS, 1997.) In that document, DHS lists agricultural drainage, urban runoff and effluent dominated streams as examples of extremely impaired sources. DHS’ policy also establishes the elements of an evaluation process for an extremely impaired source, in recognition that some communities may not have any choice, and requires entities wishing to use such sources to demonstrate other supplies are not available and that suppliers will provide extensive monitoring and treatment to protect public health.

Robert Hultquist, Chief of the Drinking Water Technical Operations section at DHS, testified during administrative hearings on Vacaville’s NPDES permit. When asked if there were any circumstances under which DHS would allow someone to use Old Alamo Creek as a municipal water supply, Mr. Hultquist responded, “Those (Old Alamo, New Alamo and Ulatis Creeks) are extremely impaired water bodies. It certainly is not foreseeable that those are going to be used as drinking supplies. It's remotely possible. We do have a policy that allows us to evaluate the use of extremely impaired sources of drinking water supplies when people of the state have a need to use that drinking water source. But it's certainly extremely unlikely and not foreseeable in this case.” (SWRCB transcript, 2001. p. 449, lines 1-8.) While not determinative of what is or is not a source of drinking water for the purposes of water quality standards, DHS’ policy memo and Mr. Hultquist’s testimony are an indication that Old Alamo Creek downstream of the EWWTP would be a marginal municipal supply at best.

The State Board’s “Sources of Drinking Water” Policy (Resolution 88-63) provides explicit exemptions for waters in systems constructed to convey wastewater, urban stormwater and agricultural returns. (SWRCB, 1988; Basin Plan, p. II-2.00, Appendix 8.) Old Alamo Creek does not completely satisfy these requirements because it is not entirely a constructed agricultural drain or wastewater conveyance. (SWRCB, 2002. pp. 25-28.) The implication of the exceptions for constructed agricultural drains and waste-water conveyances is that flows made up entirely of agricultural or domestic wastewater should not be designated MUN. Old Alamo Creek's flows fall within this category. The State Board has committed to consider a site specific exception to Resolution 88-63 for Old Alamo Creek concurrent with its action on this proposed Basin Plan amendment. (SWRCB, 2002. pp. 28, 72.)

3.3.2.2 Hydrologic modifications

In order for a state to rely on hydrologic modifications to dedesignate a use, federal regulations at 40 CFR 131.10(g)(4) require the state to demonstrate that it is not feasible to restore the water body to its original condition or to operate the modification in a way that would result in use attainment. (Tetra Tech, 2004. p. [6-6].) There are three major hydrologic modifications to Old Alamo Creek that impact the feasibility of attaining COLD, MIGR, MUN and SPWN. The first is the disconnection from Alamo Creek. The second is the iron flap gates at the confluence with New Alamo Creek. The third is the channel filling and realignment upstream from Elmira and downstream from the EWWTP.

By disconnecting Old Alamo from Alamo Creek, NRCS eliminated access through Old Alamo Creek to habitat for organisms that COLD, MIGR and SPWN protect. The disconnection with the upper watershed also eliminated cooler water sources from Old Alamo Creek. This hydrologic modification additionally eliminated flows in Old Alamo Creek that could serve as a municipal or domestic supply. The point of disconnection between Old Alamo Creek and Alamo Creek is now a residential area and houses have been built on the former Alamo Creek channel. (Old Alamo Creek Photographs. Aerial photograph 1, Ground photographs 1-11.) Downstream of the disconnection, the former Alamo Creek channel (now upper Old Alamo Creek) meanders through a residential area. (Old Alamo Creek Photographs. Aerial photograph 1, Ground photographs 8, 9, 11, 13; Tetra Tech, 2004. Figure [8-4].) Restoring historic flows would require entire neighborhoods, streets and parks to be relocated. Thus, it is not feasible to restore Alamo Creek to its original condition. Nor is there evidence that the modification can be "operated" in a manner to attain the four uses at issue.

NRCS installed flap gates between Old and New Alamo Creeks ostensibly to prevent flood waters from backing up into Old Alamo from New Alamo. (Vacaville, 1998a. pp. [4.3-6]-[4.3-7].) Removing the gates would expose landowners along Old Alamo Creek to an increased flood risk. If flooding for some reason could be ignored, the flap gates could conceivably be removed. Removal of the flap gates would allow fish to move into the Old Alamo Creek channel but the unsuitable spawning habitat would make such movement unproductive. (Tetra Tech, 2004. p. [6-6].) Even during rainfall events when there is some small flow from areas upstream of the EWWTP, the creek channel ends for all intents and purposes along the side of Elmira Road, between Vacaville and Elmira. (Old Alamo Creek Photographs. Aerial photograph 3, Ground photograph 17.)

Some portions of the creek channel in this area are filled. (Vacaville, 2001. p. 4.) Hence, it is not feasible to remove the flap gates due to the flood risk, nor can the flap gates be operated to attain COLD, MIGR, or SPWN.

Between Vacaville and Elmira, Old Alamo Creek becomes a small channel alongside Elmira Road. (Old Alamo Creek Photographs. Aerial photograph 2, Ground photograph 16.) It is also dammed to create a small pond. (Old Alamo Creek Photographs. Aerial photograph 3, Ground photograph 17.) Some parts of the channel are filled. All of these features would have to be removed and the original creek bed would have to be restored to its original state to handle flows from Alamo Creek's watershed. This would necessitate significant disturbances of existing land uses. In addition, a careful analysis of the flood hazard posed by restoring the channels would be necessary. New Alamo Creek currently carries flows from the upper watershed.

Downstream of the EWWTP, SID maintains Old Alamo Creek as a trapezoidal channel. (Old Alamo Creek Photographs. Aerial Photograph 6, Ground Photographs 26, 28-31.) This configuration allows a consistent flow for irrigation supplies and tail water returns. It also provides flood protection. (Vacaville, 1998a. p. [4.3-3].) SID also removes vegetation along the creek. A lack of streamside and instream vegetative cover allows Old Alamo Creek's temperature to exceed the optimal range for species protected by COLD, MIGR and SPWN. (Tetra Tech, 2004. p. [5-14].) Streamside and instream vegetation is actively removed in many locations along Old Alamo Creek to increase flow conveyance and minimize flood risks. (Old Alamo Creek Photographs. Aerial photographs 2, 9, 10; Ground photographs 16, 26, 28-31.) Restoring the vegetation along Old Alamo Creek, although possible, would conflict with efforts to maximize the creek's capacity.

Without a riparian canopy, water temperatures are higher. Warm water does not provide suitable habitat for cold water organisms. Higher temperatures also decrease oxygen's solubility, lowering dissolved oxygen (DO). Cold water species generally require more DO than warm water species. High DO is important for organisms protected by MIGR and SPWN as well. Data from February to July 2002 indicate that while effluent from the EWWTP is usually 20^{o}C or greater, Old Alamo Creek's temperature tends to decrease a short distance downstream before rising again as the riparian cover decreases. (Tetra Tech, 2004, Figure 4-3.) Dissolved oxygen exhibits a more complicated pattern. Average DO concentrations tend to increase from the EWWTP outfall to the confluence with New Alamo Creek. (Tetra Tech, 2004, figure 4-4.) Minimum DO concentrations, however, tend to increase downstream before decreasing at the confluence with New Alamo. (Tetra Tech, 2004, Figure 4-5.) This effect is most pronounced in August when water temperatures are at their highest. This indicates that Old Alamo Creek's physical features that stem from hydrologic modifications play a significant role in regulating temperature and minimum DO concentrations.

The channelization of Old Alamo Creek has resulted in few riffle areas, poor habitat cover and poor riparian habitat, all of which adversely impact COLD and SPWN. If the potential flood risks could be adequately addressed, it is theoretically possible to restore the creek. Restoration would not result in attaining COLD or SPWN, however, given the creek's disconnection from the upper watershed, its low elevation, and the prevailing air temperatures.

3.3.2.3 Physical conditions

Unsuitable natural physical conditions (40 CFR 131.10(g)(5)) prevent attainment of COLD and SPWN. Old Alamo Creek's clay, silt and sand substrate is not suitable for many types of aquatic life that COLD and SPWN protect. (Tetra Tech, 2004. pp. [5-6]-[5-7] and [7-3].) This is a natural feature of many valley floor streams and is what one would expect for the Alamo Creek system. (Tetra Tech, 2004. p. [5-9] and [6-6].) Alternating riffles and pools are another feature that species protected by COLD and SPWN require. (Tetra Tech, 2004. pp. [5-9], [7-3]-[7-4].) It is not known what Old Alamo Creek's exact morphology was prior to NRCS' modifications, but given the natural streambed materials it is unlikely that a true riffle/pool environment ever existed in Old Alamo Creek. (Tetra Tech, 2004. pp. [5-9], [5-16].) It is also unlikely that cold freshwater organisms protected by COLD and SPWN would survive in Old Alamo Creek even in its "natural" state because of its entire location on the Central Valley floor. (Tetra Tech, 2004. p. [5-14].) Predominant substrate types are not suitable for Shortnosed sturgeon and American shad, two warm water organisms protected by SPWN. (Tetra Tech, 2004. Table [7-1] and p. [7-3].) In addition, as discussed in Section 3.3.1.3, the velocities are not suitable for sturgeon and shad spawning and the temperatures are not suitable for sturgeon spawning.

4 ENVIRONMENTAL ANALYSIS

The proposed amendment will dedesignate four uses, COLD, MUN, SPWN, and MIGR, for Old Alamo Creek. These uses do not exist and cannot feasibly be attained due to one or more factors, including low flows, hydrologic modifications, and physical conditions. Adoption of the proposed amendment will not have any effect on the existing physical environment because the amendment will not change Old Alamo Creek's uses or otherwise change the environment. These conclusions are reflected in the CEQA Checklist. The amendment simply recognizes the reality that the four uses do not currently exist and cannot feasibly be attained in the future. The amendment will enable the Regional Board to regulate waste discharges to Old Alamo Creek and to make impairment assessments based on appropriate beneficial uses.

Because adoption of the proposed amendment does not have the potential to adversely impact the existing physical environment, it is unnecessary to consider alternatives to the proposed action. Nevertheless, the Regional Board has considered the "no action" alternative. The "no action" alternative would preserve the status quo. It would require the Regional Board to regulate waste discharges to Old Alamo Creek and to make impairment assessments based on uses that do not exist and cannot feasibly be attained in the future. This result is undesirable because it would require the expenditure of resources to protect non-existent uses. For this reason, staff recommends adoption of the proposed amendment.

5 ECONOMIC CONSIDERATIONS

CWC section 13241 requires Regional Boards to consider economics when adopting water quality objectives. Additionally, when a Regional Board adopts an agricultural water quality control program, the Regional Board must estimate the program's total cost and identify potential financing sources. CEQA requires Regional Boards to conduct an environmental analysis of the reasonably foreseeable methods of compliance, including economic factors, when adopting a treatment or performance standard. Also, under CEQA the Regional Boards may consider economic impacts that are associated with environmental impacts. (PRC section 21000 et seq.) Under federal regulations at 40 CFR 131.10(g)(6), States may use adverse social and economic impacts to justify dedesignating a potential use, not designating potential uses required by CWA section 101(a)(2) or creating use subcategories.

Although the Regional Board is not legally required to consider economics when dedesignating uses, the Regional Board has done so in this case. Dedesignating MUN, COLD, MIGR, and SPWN for Old Alamo Creek is not expected to have an adverse economic impact. Entities discharging wastes to the creek will no longer have to meet requirements to protect COLD, MIGR, MUN and SPWN in Old Alamo Creek in their NPDES permits, although, dischargers will be expected to protect these uses at the first downstream water body with these beneficial uses. If dischargers had upgraded treatment to meet requirements to protect these beneficial uses, the proposed amendment would be expected to decrease treatment costs. Currently there is only one major (>1 mgd) discharge to Old Alamo Creek, Vacaville's EWWTP, which has not incorporated treatment to protect these beneficial uses. Compliance with criteria and objectives that protect MUN would be expected to pose the most costly treatment scenario for Vacaville. In 2001, SAIC, a consulting firm that conducts economic analyses for the State Board, examined potential costs for Vacaville to comply with criteria and objectives to protect MUN. SAIC produced two scenarios that provide a range of anticipated costs. To protect MUN from a chemical pollutant standpoint, Vacaville would have to limit its discharge of nitrate and trihalomethanes (THMs). THMs are a byproduct of chlorine disinfection. SAIC identified two control scenarios for these pollutants. Both included denitrification to minimize nitrate. Scenario one included ultraviolet light disinfection to eliminate chlorine disinfection as a means to prevent THM formation. Scenario two included granular activated carbon to remove THMs after they are formed. Cost estimates ranged from $10.7 million (scenario one) to $26.1 million (scenario two) in capital expenditures and between $1.3 million (scenario one) and $1.7 million (scenario two) in operation and maintenance costs. (SAIC, 2001. pp. 11-13.)

Any discharger to Old Alamo Creek will have to control pollutant loads in a manner that protects downstream uses. Water quality standards for Old Alamo Creek must provide for the attainment and maintenance of water quality standards for the downstream waters. Dedesignating these four beneficial uses for Old Alamo Creek is unlikely to result in additional pollutant discharges and will not, in and of itself, cause downstream water quality objectives to be exceeded. The proposed dedesignation is unlikely to increase pollutant loading because Vacaville, the only major discharger to the creek, currently does not achieve all requirements necessary to protect MUN or COLD. To the extent that Vacaville can achieve effluent limits to protect these uses, both antibacksliding and antidegradation requirements may preclude Vacaville from increasing current pollutant loading. In addition, Vacaville's discharge must ensure that downstream uses, which include MUN and COLD, are protected.

The Sacramento-San Joaquin Delta's legal boundary is less than 6 miles downstream from Vacaville's discharge. The Delta is a major municipal and agricultural water supply for a significant portion of California's population. Increased pollutant loads to Old Alamo Creek could raise treatment costs for entities drawing supplies from the Delta. Accordingly, it is essential to ensure that upstream dischargers protect not only their receiving water's uses but also those of downstream waters. Compliance with federal requirements that NPDES permits include any limitations that are necessary to meet water quality standards will prevent the proposed amendment from causing significant adverse economic impacts to entities that rely on the Delta. (CWA §301(b)(1)(C); 40 CFR 122.44(d).)

6 ANTIDEGRADATION ANALYSIS

Both USEPA (40 CFR 131.12) and the State of California (State Board Resolution 68-16) have adopted antidegradation policies as part of their approach to regulating water quality. The Regional Board must ensure that its actions do not violate the federal or State antidegradation policies. This section of the Staff Report analyzes whether approval of the proposed amendments would be consistent with the federal and State antidegradation policies.

6.1 Federal Antidegradation Policy

The federal antidegradation policy, 40 CFR 131.12(a), states in part:

"(1) Existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected.

(2) …. Where the quality of waters exceed levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected unless the State finds, after full satisfaction of the intergovernmental coordination and public participation provisions of the State's continuing planning process, that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located….

(3) Where high quality waters constitute an outstanding National resource, such as waters of National and State parks and wildlife refuges and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected."

6.2 State Antidegradation Policy

Antidegradation provisions of State Board Resolution No. 68-16 ("Statement of Policy With Respect to Maintaining High Quality Waters in California") state, in part:

"1. Whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality will be maintained until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water and will not result in water quality less than that prescribed in the policies.

2. Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of *the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained."*

6.3 Antidegradation Analysis of the Proposed Amendments

The proposed amendment is not expected to result in a lowering of water quality. The proposed amendment dedesignates four uses for Old Alamo Creek that do not exist and cannot feasibly be attained. This action is not expected to result in any significant increase in the discharge of pollutants to the creek. In addition, any discharge to Old Alamo Creek must be regulated to ensure that downstream water quality standards are met.

7 ENDANGERED SPECIES ACT CONSIDERATIONS

7.1 OVERVIEW AND BACKGROUND

USEPA has final approval authority for Basin Plan amendments. USEPA's approval of new and revised state water quality standards is a federal action subject to the consultation requirements of Section 7(a)(2) of the federal Endangered Species Act (ESA). (65 FR 24647 (April 27, 2000).) Section 7(a)(2) of the ESA states that each federal agency shall ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in destruction or adverse modification of designated critical habitat. As part of its review and approval of the proposed Basin Plan amendments, USEPA may consult with the NMFS and the USFWS under Section 7(a)(2) of the ESA. In addition to addressing the issues of "jeopardy" and "adverse modification" of designated critical habitat, this consultation also will address whether USEPA's approval action has the potential to result in "take" of any listed species, as defined under Section 9 of the ESA. Although consultation under the ESA is USEPA's obligation, USEPA and the states acknowledge that states can assist USEPA in fulfilling its ESA obligations, and have a role in assuring that state standards adequately protect aquatic life and the environment, including species federally listed as threatened or endangered. (65 FR 24643.)

This section of the Staff Report has been prepared to assist USEPA in meeting its obligations under ESA section 7(a)(2) as part of its action to approve the proposed amendment.

7.2 NOAA FISHERIES ESA CONSIDERATIONS

NOAA Fisheries has regulatory jurisdiction over anadromous fish and is the agency responsible for listing Central Valley winter-run Chinook salmon as endangered. (59 FR 442, January 4, 1994.) NOAA fisheries also listed spring-run Chinook salmon (64 FR 50393, September 16, 1999) and Steelhead (63 FR 13347, March 19, 1998; effective May 18, 1998) as threatened under the federal ESA.

The amendment will not result in conditions that would adversely affect federally listed salmonids or their habitats. In addition, the proposed amendment does not affect any downstream uses and waste discharges to Old Alamo Creek will not be allowed to impact any downstream uses.

7.3 USFWS ESA CONSIDERATIONS

The USFWS has regulatory jurisdiction over all species listed under the federal ESA that are not anadromous salmonids. The proposed federal action is approval of the proposed dedesignations.

4 REFERENCES

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APPENDIX A

Municipal and Domestic Supply (MUN) - Uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.

Agricultural Supply (AGR) - Uses of water for farming, horticulture, or ranching including, but not limited to, irrigation (including leaching of salts), stock watering, or support of vegetation for range grazing.

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

Industrial Process Supply (PRO) - Uses of water for industrial activities that depend primarily on water quality.

Ground Water Recharge (GWR) - Uses of water for natural or artificial recharge of ground water for purposes of future extraction, maintenance of water quality, or halting of saltwater intrusion into freshwater aquifers.

Freshwater Replenishment (FRSH) - Uses of water for natural or artificial maintenance of surface water quantity or quality.

Navigation (NAV) - Uses of water for shipping, travel, or other transportation by private, military, or commercial vessels.

Hydropower Generation (POW) - Uses of water for hydropower generation.

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

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

Commercial and Sport Fishing (COMM) - Uses of water for commercial or recreational collection of fish, shellfish, or other organisms including, but not limited to, uses involving organisms intended for human consumption or bait purposes.

Aquaculture (AQUA) - Uses of water for aquaculture or mariculture operations including, but not limited to, propagation, cultivation, maintenance, or harvesting of aquatic plants and animals for human consumption or bait purposes.

Warm Freshwater Habitat (WARM) - Uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.

Cold Freshwater Habitat (COLD) - Uses of water that support cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.

Estuarine Habitat (EST) - Uses of water that support estuarine ecosystems including, but not limited to, preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (e.g., estuarine mammals, waterfowl, shorebirds).

Wildlife Habitat (WILD) - Uses of water that support terrestrial or wetland ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats or wetlands, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.

Preservation of Biological Habitats of Special Significance (BIOL) - Uses of water that support designated areas or habitats, such as established refuges, parks, sanctuaries, ecological reserves, or Areas of Special Biological Significance (ASBS), where the preservation or enhancement of natural resources requires special protection.

Rare, Threatened, or Endangered Species (RARE) - Uses of water that support aquatic habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened or endangered.

Migration of Aquatic Organisms (MIGR) – Uses of water that support habitats necessary for migration or other temporary activities by aquatic organisms, such as anadromous fish.

Spawning, Reproduction, and/or Early Development (SPWN) - Uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish.

Shellfish Harvesting (SHELL) - Uses of water that support habitats suitable for the collection of filter-feeding shellfish (e.g., clams, oysters, and mussels) for human consumption, commercial, or sports purposes.

APPENDIX B

Modify the first two paragraphs on page II-2.00 of the Basin Plan, under the heading **SURFACE WATERS**, as follows:

SURFACE WATERS

Existing and potential beneficial uses which currently apply to surface waters of the basins are presented in Figure II-1 and Table II-1. The beneficial uses of any specifically identified water body generally apply to its tributary streams, *except that MUN, COLD, MIGR, AND SPWN do not apply to Old Alamo Creek*. . . . For unidentified water bodies, the beneficial uses will be evaluated on a case-by-case basis.

Water Bodies within the basins that do not have beneficial uses designated in Table II-1*, excepting Old Alamo Creek,* are assigned MUN designations in accordance with the provisions of State Water Board Resolution No. 88-63 which is, by reference, a part of this Basin Plan. These MUN designations in no way affect the presence or absence of other beneficial use designations in these water bodies.