previous permit, with some exceptions in which limitations may be relaxed. Compliance with the Anti-Backsliding requirements is discussed in Section IV.D.3.

6. **Emergency Planning and Community Right to Know Act.** Section 13263.6(a), California Water Code, requires that "*the Regional Water Board shall prescribe effluent limitations as part of the waste discharge requirements of a POTW for all substances that the most recent toxic chemical release data reported to the state emergency response commission pursuant to Section 313 of the Emergency Planning and Community Right to Know Act of 1986 (42 U.S.C. Sec. 11023) (EPCRKA) indicate as discharged into the POTW, for which the State Water Board or the Regional Water Board has established numeric water quality objectives, and has determined that the discharge is or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to, an excursion above any numeric water quality objective*".

   The Regional Water Board has adopted a numeric receiving water objective for arsenic, barium, copper, cyanide, iron, manganese, silver, and zinc that apply to the Sacramento-San Joaquin River Delta, including Ulatis Creek and Cache Slough to which Old and New Alamo Creeks are tributary. The most recent toxic chemical data report does not indicate any reportable off-site releases or discharges to the collection system for this facility. Therefore, a reasonable potential analysis based on information from Emergency Planning and Community Right to Know Act (EPCRA) cannot be conducted. Based on information from EPCRA, there is no reasonable potential to cause or contribute to an excursion above any numeric water quality objectives included within the Basin Plan or in any State Water Board plan, so no effluent limitations are included in this permit pursuant to CWC section 13263.6(a).

   However, as detailed elsewhere in this Order, available effluent data indicate that effluent concentrations of cyanide have a reasonable potential to cause or contribute to an excursion above numeric water quality objectives for cyanide included within the Basin Plan and an effluent limitation is established for this constituent based on federal and state laws and regulations.

7. **Stormwater Requirements.** USEPA promulgated Federal Regulations for storm water on 16 November 1990 in 40 CFR Parts 122, 123, and 124. The NPDES Industrial Storm Water Program regulates storm water discharges from wastewater treatment facilities. Wastewater treatment plants are applicable industries under the stormwater program and are obligated to comply with the Federal Regulations.

8. **Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 U.S.C.A. sections 1531 to 1544). This Order requires compliance with effluent limits, receiving water limits, and other requirements to protect the

beneficial uses of waters of the state. The Discharger is responsible for meeting all requirements of the applicable Endangered Species Act.

D. Impaired Water Bodies on CWA 303(d) List

1. Under Section 303(d) of the 1972 Clean Water Act, states, territories and authorized tribes are required to develop lists of water quality limited segments. The waters on these lists do not meet water quality standards, even after point sources of pollution have installed the minimum required levels of pollution control technology. On July 25, 2003 USEPA gave final approval to California's 2002 Section 303(d) List of Water Quality Limited Segments. The Basin Plan references this list of Water Quality Limited Segments (WQLSs), which are defined as "*...those sections of lakes, streams, rivers or other fresh water bodies where water quality does not meet (or is not expected to meet) water quality standards even after the application of appropriate limitations for point sources (40 CFR 130, et seq.).*" The Basin Plan also states, "*Additional treatment beyond minimum federal standards will be imposed on dischargers to [WQLSs]. Dischargers will be assigned or allocated a maximum allowable load of critical pollutants so that water quality objectives can be met in the segment.*" The listing for the northwestern portion of the Delta as a WQLS includes: Chloropyrifos, DDT, Diazinon, Electrical Conductivity, Exotic Species, Mercury, Group A Pesticides, and Unknown Toxicity. Since Old Alamo and New Alamo Creeks are immediate tributaries to the Delta and provide very little to no dilution, effluent limitations are included in this Order for all of these constituents that are detected in the discharge. Diazinon and Chloropyrifos have consistently shown as non-detect in the effluent and therefore no effluent limitations are included in this Order, but monitoring for these and the other 303(d) listed constituents are included in the Constituent Study required by this Order.

2. **Total Maximum Daily Loads.** The US EPA requires the Regional Water Board to develop total maximum daily loads (TMDLs) for each 303(d) listed pollutant and water body combination. A TMDL for mercury in the Delta will be adopted by the Regional Board in 2008. All other TMDLs do not expect to be adopted within the next year.

E. Other Plans, Polices and Regulations

1. The discharge authorized herein and the treatment and storage facilities associated with the discharge of treated municipal wastewater, except for discharges of residual sludge and solid waste, are exempt from the requirements of Title 27, California Code of Regulations (CCR), section 20005 *et seq.* (hereafter Title 27). The exemption, pursuant to Title 27 CCR section 20090(a), is based on the following:

   a. The waste consists primarily of domestic sewage and treated effluent;

   b. The waste discharge requirements are consistent with water quality objectives; and

c. The treatment and storage facilities described herein are associated with a municipal wastewater treatment plant.

2. The State Water Board adopted the *Water Quality Control Policy for the Enclosed Bays and Estuaries of California*. The requirements within this Order are consistent with the Policy.

IV. RATIONALE FOR EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

Effluent limitations and toxic and pretreatment effluent standards established pursuant to Sections 301 (Effluent Limitations), 302 (Water Quality Related Effluent Limitations), 304 (Information and Guidelines), and 307 (Toxic and Pretreatment Effluent Standards) of the Clean Water Act (CWA) and amendments thereto are applicable to the discharge.

The Federal CWA mandates the implementation of effluent limitations that are as stringent as necessary to meet water quality standards established pursuant to state or federal law [33 U.S.C., § 1311(b)(1)(C); 40 CFR, § 122.44(d)(1)]. NPDES permits must incorporate discharge limits necessary to ensure that water quality standards are met. This requirement applies to narrative criteria as well as to criteria specifying maximum amounts of particular pollutants. Pursuant to Federal Regulations, 40 CFR Section 122.44(d)(1)(i), NPDES permits must contain limits that control all pollutants that "*are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard, including state narrative criteria for water quality.*" Federal Regulations, 40 CFR, §122.44(d)(1)(vi), further provide that "[w]*here a state has not established a water quality criterion for a specific chemical pollutant that is present in an effluent at a concentration that causes, has the reasonable potential to cause, or contributes to an excursion above a narrative criterion within an applicable State water quality standard, the permitting authority must establish effluent limits.*"

The CWA requires point source discharges to control the amount of conventional, non-conventional, and toxic pollutants that are discharged into the waters of the United States. The control of pollutants discharged is established through effluent limitations and other requirements in NPDES permits. There are two principal bases for effluent limitations: 40 CFR §122.44(a) requires that permits include applicable technology-based limitations and standards, and 40 CFR §122.44(d) requires that permits include water quality-based effluent limitations to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of the receiving water where numeric water quality objectives have not been established. The Regional Water Board's Basin Plan, page IV-17.00, contains an implementation policy ("Policy for Application of Water Quality Objectives" that specifies that the Regional Water Board "*will, on a case-by-case basis, adopt numerical limitations in orders which will implement the narrative objectives.*" This Policy complies with 40 CFR §122.44(d)(1). With respect to narrative objectives, the Regional Water Board must establish effluent limitations using one or more of three specified sources, including (1) EPA's published water quality criteria, (2) a proposed state criterion (*i.e.*, water quality objective) or an

explicit state policy interpreting its narrative water quality criteria (*i.e.*, the Regional Water Board's "Policy for Application of Water Quality Objectives")(40 CFR 122.44(d)(1)(vi) (A), (B) or (C)), or (3) an indicator parameter. The Basin Plan contains a narrative objective requiring that: "*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life*" (narrative toxicity objective). The Basin Plan requires the application of the most stringent objective necessary to ensure that surface water and groundwater do not contain chemical constituents, discoloration, toxic substances, radionuclides, or taste and odor producing substances that adversely affect beneficial uses. The Basin Plan states that material and relevant information, including numeric criteria, and recommendations from other agencies and scientific literature will be utilized in evaluating compliance with the narrative toxicity objective. The Basin Plan also limits chemical constituents in concentrations that adversely affect surface water beneficial uses. For waters designated as municipal, the Basin Plan specifies that, at a minimum, waters shall not contain concentrations of constituents that exceed Maximum Contaminant Levels (MCL) of CCR Title 22. The Basin Plan further states that, to protect all beneficial uses, the Regional Water Board may apply limits more stringent than MCLs.

A. Discharge Prohibitions

1. *As stated in section I.G of Attachment D, Standard Provisions, this Order prohibits bypass from any portion of the treatment facility. Federal Regulations, 40 CFR 122.41 (m), define "bypass" as the intentional diversion of waste streams from any portion of a treatment facility. This section of the Federal Regulations, 40 CFR 122.41 (m)(4), prohibits bypass unless it is unavoidable to prevent loss of life, personal injury, or severe property damage. In considering the Regional Water Board's prohibition of bypasses, the State Water Board adopted a precedential decision, Order No. WQO 2002-0015, which cites the Federal Regulations, 40 CFR 122.41(m), as allowing bypass only for essential maintenance to assure efficient operation.* However, on 8 May 2003 the State Water Board and Regional Water Board agreed to Stay the bypass prohibition contained in the Discharge Prohibitions of Order 5-01-044 until the Contra Costa County Superior Court considers the Discharger's petition for Writ challenging the prohibition on bypass. Subsequently on 5 September 2003, the Regional Water Board adopted Resolution No. R5-2003-0129, amending Provision F.4 of Order No. 5-01-044, to stay the time schedule until the Court considers the Discharger's Petition for Writ. Therefore, Special Provisions VI.C.5.d. allows the Discharger to bypass of the secondary treatment facilities during wet weather high flow conditions. A compliance schedule to discontinue the bypass practices, pending the resolution of the Court action, is provided in Special Provision VI.C.7.a. of this Order.

B. Technology-Based Effluent Limitations

1. Scope and Authority

Regulations promulgated in section 125.3(a)(1) require technology-based effluent limitations for municipal Dischargers to be placed in NPDES permits based on Secondary Treatment Standards or Equivalent to Secondary Treatment Standards.

The Federal Water Pollution Control Act Amendments of 1972 (PL 92-500) established the minimum performance requirements for POTWs [defined in section 304(d)(1)]. Section 301(b)(1)(B) of that Act requires that such treatment works must, as a minimum, meet effluent limitations based on secondary treatment as defined by the USEPA Administrator.

Based on this statutory requirement, USEPA developed secondary treatment regulations, which are specified in Part 133. These technology-based regulations apply to all municipal wastewater treatment plants and identify the minimum level of effluent quality attainable by secondary treatment in terms of biochemical oxygen demand (BOD_5), total suspended solids (TSS), and pH.

2. Applicable Technology-Based Effluent Limitations

a. **BOD_5 and TSS.** Federal Regulations, 40 CFR, Part 133, establish the minimum weekly and monthly average level of effluent quality attainable by secondary treatment for BOD_5 and TSS. Tertiary treatment is necessary to protect the beneficial uses of the receiving stream and the final effluent limitations for BOD_5 and TSS are based on the technical capability of the tertiary process. BOD_5 is a measure of the amount of oxygen used in the biochemical oxidation of organic matter. The secondary and tertiary treatment standards for BOD_5 and TSS are indicators of the effectiveness of the treatment processes. The principal design parameter for wastewater treatment plants is the daily BOD_5 and TSS loading rates and the corresponding removal rate of the system. In applying 40 CFR Part 133 for weekly and monthly average BOD_5 and TSS limitations, the application of tertiary treatment processes results in the ability to achieve lower levels for BOD_5 and TSS than the secondary standards currently prescribed; the 30-day average BOD_5 and TSS limitations have been revised to 10 mg/L, which is technically based on the capability of a tertiary system. In addition to the average weekly and average monthly effluent limitations, a daily maximum effluent limitation for BOD_5 and TSS is included in the Order to ensure that the treatment works are not organically overloaded and operate in accordance with design capabilities. The mass limitations are based on the design flow of 15 mgd. See Table F-3 for final technology-based effluent limitations required by this Order. In addition, 40 CFR 133.102, in describing the minimum level of effluent quality attainable by secondary treatment, states that the 30-day average percent removal shall not be less than 85 percent. If 85 percent removal of BOD_5 and TSS must be achieved by a secondary treatment plant, it must also be achieved by a tertiary (i.e., treatment beyond secondary level) treatment plant. This Order contains a limitation requiring an average of 85 percent removal of BOD_5 and TSS over each calendar month.

b. **pH.** Federal Regulations, 40 CFR Part 133, also establish technology-based effluent limitations for pH. The secondary treatment standards require the pH of the effluent to be no lower than 6.0 and no greater than 9.0 standard units.

c. **Flow.** The expanded wastewater treatment plant for the City of Vacaville is designed to provide a secondary level of treatment for up to a design average dry weather flow of 15.0 mgd.

Summary of Technology-based Effluent Limitations
Discharge Point 001

Table F-3a. Summary of Technology-based Effluent Limitations – May 1 - October 31

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Flow	mgd	15				
BOD	mg/L[1]	10	15	20		
	lbs/day[2]	1252	1878	2504		
TSS	mg/L[1]	10	15	20		
	lbs/day[2]	1252	1878	2504		
pH[3]					6.0	9.0

[1] The average monthly percent removal of BOD 5-day 20°C and total suspended solids shall not be less than 85 percent.
[2] Based on a design average dry weather flow (ADWF) of 15.0 mgd.
[3] More stringent water quality-based effluent limitations for pH have been applied in this Order.

Table F-3b. Summary of Technology-based Effluent Limitations – November 1 – April 30

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Flow	mgd	15				
BOD	mg/L[1]	20	25	30		
	lbs/day[2]	2504	3127	3753		
TSS	mg/L[1]	30	45	50		
	lbs/day[2]	3753	5630	6255		
pH[3]					6.0	9.0

[1] The average monthly percent removal of BOD 5-day 20°C and total suspended solids shall not be less than 85 percent.
[2] Based on a design ADWF of 15.0 mgd.
[3] More stringent water quality-based effluent limitations for pH have been applied in this Order.

C. Water Quality-Based Effluent Limitations (WQBELs)

1. Scope and Authority

As specified in section 122.44(d)(1)(i), permits are required to include WQBELs for pollutants (including toxicity) that are or may be discharged at levels that cause, have reasonable potential to cause, or contribute to an in-stream excursion above any state water quality standard. The process for determining reasonable potential and calculating WQBELs when necessary is intended to protect the designated uses of the receiving water as specified in the Basin Plan, and achieve applicable water quality objectives and criteria that are contained in other state plans and policies, or any applicable water quality criteria contained in the CTR and NTR.

2. Applicable Beneficial Uses and Water Quality Criteria and Objectives

a. **Receiving Water.** The Basin Plan does not specifically identify beneficial uses for *Old Alamo Creek and New Alamo Creek*, but does identify present and potential uses for *the Sacramento San Joaquin River Delta (Delta)* to which *Old Alamo Creek*, via *New Alamo Creek*, is tributary. These beneficial uses are as follows: municipal and domestic supply (MUN), irrigation and stock watering agricultural supply (AGR), industrial process (PRO) and service supply (IND), contact (REC-1) and non-contact (REC-2) water recreation, freshwater habitat for both warm (WARM) and cold (COLD) species, migration (MIGR) waters for both warm (striped bass, sturgeon, and shad) and cold water freshwater species (salmon and steelhead), spawning (SPWN) for warm water species (striped bass, sturgeon, and shad), wildlife habitat (WILD), and navigation (NAV). The Basin Plan further states at page II-2.00 that the "*...beneficial uses of any specifically identified water body generally apply to its tributary streams except as provided below:*

• MUN, COLD, MIGR and SPWN do not apply to Old Alamo Creek (Solano County) from its headwaters to the confluence with New Alamo Creek."

In addition, the Basin Plan implements State Water Resources Control Board (State Water Board) Resolution No. 88-63, which established state policy that all waters (except for Old Alamo Creek (Solano County) from its headwaters to the confluence with New Alamo Creek) with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Therefore applicable beneficial uses for Old Alamo Creek include: AGR, REC-1, REC-2, WARM, PRO, IND, and, WILD; and applicable beneficial uses for New Alamo Creek include: MUN, AGR, REC-1, REC-2, COLD, WARM, MIGR, SPWN, PRO, IND, WILD and NAV.

b. **Hardness.** While no effluent limitation for hardness is necessary in this Order, hardness is critical to the assessment of the need for, and the development of, effluent limitations for certain metals. The *California Toxics Rule* and the *National Toxics Rule* contain water quality criteria for seven metals that vary as a function of hardness, the lower the hardness the lower the water quality criteria. The hardness-dependent metals include cadmium, copper, chromium III, lead, nickel, silver, and zinc. The equation describing the total recoverable regulatory criterion is as follows:

$$\text{CTR Criterion (expressed as dissolved)} = \text{WER} \times \text{CF} \times e^{m[\ln(H)]+b} \quad \text{(Equation 1)}$$

Where:

WER = water-effect ratio (default of 1.0 used in this Order)
CF = total-to-dissolved conversion factor
m = criterion-specific constant
H = Hardness
b = criterion-specific constant

The constants "m" and "b" are specific to both the metal under consideration, and the type of total recoverable criterion (i.e. acute or chronic).

Effluent limitations for the discharge must be set to protect the beneficial uses of the receiving water for all discharge conditions. In the absence of the option of including condition-dependent, "floating" effluent limitations that are reflective of actual conditions at the time of discharge, effluent limitations must be set using a reasonable worst-case condition in order to protect beneficial uses for all discharge conditions. Recent studies indicate that using the receiving water lowest hardness for establishing water quality criteria is not the most protective for the receiving water. The Regional Water Board has evaluated these studies

and concurs that for some parameters the beneficial uses of the receiving water are best protected using the lowest hardness value of the effluent, while for some parameters, the use of both the lowest hardness value of the receiving water and the lowest hardness value of the effluent is the most protective, provided sufficient hardness data for the effluent and receiving water are available.

Because of the non-linearity of the Total Recoverable Criterion equation, the relationship can be either concave downward or concave upward depending on the criterion-specific constants. For those contaminants whereby the regulatory criteria exhibit a concave downward relationship as a function of hardness (e.g. acute and chronic copper, chromium III, nickel, and zinc, and chronic cadmium), use of the lowest recorded effluent hardness for establishment of water quality objectives is fully protective of all beneficial uses regardless of whether the effluent or receiving water hardness is higher.

For purposes of calculating WQBELs for hardness dependent metals, the lowest effluent hardness of 125 mg/L as $CaCO_3$ was used, based on 58 samples from January 2003 through November 2007.

c. **Assimilative Capacity/Mixing Zone.** The City completed an effluent dilution analysis, prepared by Flow Science to better assess the fate and dilution of the facility's effluent in its receiving waters. The analysis evaluated the fate and dilution of the effluent under a range of seasonal conditions. Based on results of the dilution dye study, and protective of all scenarios, the minimum dilution available at the confluence of Old Alamo and New Alamo Creeks is 1.1 to 1.0. Therefore, a dilution credit of 1.1 was used in this order when establishing effluent limitations for the protection of MUN at New Alamo Creek. This dilution credit may not be appropriate for long-term human health criteria. Therefore, this Order requires the Discharger to conduct a human health criteria dilution study to re-evaluate the human health dilution credit.

Due to periods of no flow in Old Alamo Creek upstream of the discharge, no dilution has been allowed for setting effluent limitations for protection of beneficial uses applicable to Old Alamo Creek (i.e. AGR, PRO, IND, REC-1, REC-2, WARM, WILD and NAV).

3. Determining the Need for WQBELs

a. CWA section 301 (b)(1) requires NPDES permits to include effluent limitations that achieve technology-based standards and any more stringent limitations necessary to meet water quality standards. Water quality standards include Regional Water Board Basin Plan beneficial uses and narrative and numeric water quality objectives, State Water Board-adopted standards, and federal standards, including the CTR and NTR. The Basin Plan includes numeric site-specific water quality objectives and narrative objectives for toxicity, chemical

constituents, and tastes and odors. The narrative toxicity objective states: "*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.*" (Basin Plan at III-8.00.) With regards to the narrative chemical constituents objective, the Basin Plan states that waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses. At minimum, "*...water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCLs)*" in Title 22 of CCR. The narrative tastes and odors objective states: "*Water shall not contain taste- or odor-producing substances in concentrations that impart undesirable tastes or odors to domestic or municipal water supplies or to fish flesh or other edible products of aquatic origin, or that cause nuisance, or otherwise adversely affect beneficial uses.*"

b. Federal regulations require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause, or contribute to an in-stream excursion above a narrative or numerical water quality standard. Based on information submitted as part of the application, in studies, and as directed by monitoring and reporting programs, the Regional Water Board finds that the discharge has a reasonable potential to cause or contribute to an in-stream excursion above a water quality standard for cyanide, chlorodibromomethane, total trihalomethanes, dichlorobromomethane, ammonia, nitrate, chlorine residual, electrical conductivity (EC), chloride, and total dissolved solids (TDS). Water quality-based effluent limitations (WQBELs) for these constituents are included in this Order. A summary of the reasonable potential analysis (RPA) for all constituents is provided in Attachment G and a detailed discussion of the RPA for each constituent that required effluent limitations is provided below.

c. The Regional Water Board conducted the RPA in accordance with Section 1.3 of the SIP. Although the SIP applies directly to the control of CTR priority pollutants, the State Water Board has held that the Regional Water Board may use the SIP as guidance for water quality-based toxics control.[1] The SIP states in the introduction "*The goal of this Policy is to establish a standardized approach for permitting discharges of toxic pollutants to non-ocean surface waters in a manner that promotes statewide consistency.*" Therefore, in this Order the RPA procedures from the SIP were used to evaluate reasonable potential for both CTR and non-CTR constituents. Effluent data from December 2004 through November 2007 was used for the RPA. This dataset represents the quality of the effluent after the Facility was last upgraded. Since Old Alamo Creek frequently has no flow upstream of the discharge, the RPA was conducted using only effluent data for compliance with criteria/objectives protective of the beneficial uses of Old Alamo Creek. For criteria/objectives protective of the MUN beneficial use, which is applicable to New Alamo Creek, receiving water data collected in

[1] See, Order WQO 2001-16 (Napa) and Order WQO 2004-0013 (Yuba City)

New Alamo Creek, upstream of the confluence with Old Alamo Creek, was used for the RPA.

d. WQBELs were calculated in accordance with section 1.4 of the SIP, as described in Attachment F, Section IV.C.4.

e. **Ammonia.** Untreated domestic wastewater contains ammonia. Nitrification is a biological process that converts ammonia to nitrite and nitrite to nitrate. Denitrification is a process that converts nitrate to nitrite or nitric oxide and then to nitrous oxide or nitrogen gas, which is then released to the atmosphere. The Discharger currently uses nitrification to remove ammonia from the waste stream. Inadequate or incomplete nitrification may result in the discharge of ammonia to the receiving stream. Ammonia is known to cause toxicity to aquatic organisms in surface waters. Discharges of ammonia would violate the Basin Plan narrative toxicity objective. Applying 40 CFR section 122.44(d)(1)(vi)(B), it is appropriate to use USEPA's Ambient National Water Quality Criteria for the Protection of Freshwater Aquatic Life for ammonia, which was developed to be protective of aquatic organisms.

USEPA's *Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life*, for total ammonia, recommends acute (1-hour average; criteria maximum concentration) standards based on pH and chronic (30-day average, criteria continuous concentration) standards based on pH and temperature. It also recommends a maximum four-day average concentration of 2.5 times the criteria continuous concentration. USEPA found that as pH increased, both the acute and chronic toxicity of ammonia increased. Salmonids were more sensitive to acute toxicity effects than other species. However, while the acute toxicity of ammonia was not influenced by temperature, it was found that invertebrates and young fish experienced increasing chronic toxicity effects with increasing temperature. Because the immediate receiving stream, Old Alamo Creek does not have a beneficial use of cold freshwater habitat, the recommended criteria for waters where salmonids and early life stages are present was not used in the calculation of effluent limitations. USEPA's recommended criteria are show below:

$$CCC_{30\text{-}day} = \left(\frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}}\right) \times \left(1.45x10^{0.028(25-MAX(T,7))}\right), \text{ and}$$

$$CMC = \left(\frac{0.411}{1+10^{7.204-pH}} + \frac{58.4}{1+10^{pH-7.204}}\right),$$

where T is in degrees Celsius

Since Old Alamo Creek is an effluent dominated waterbody, acute and chronic ammonia toxicity criteria were calculated using effluent pH and temperature.

The maximum permitted effluent pH is 8.5 as the Basin Plan objective for pH in

the receiving stream is in the range of 6.5 to 8.5. In order to protect against the worst-case short-term exposure of an organism, a pH value of 8.5 was used to derive the acute criterion. The resulting acute criterion is 3.2 mg/L, with salmonids not present.

The 30-day average CCC is calculated using the temperature and pH of the effluent. Using effluent data from January 2005 through November 2007, the CCC (30-day average) was calculated for each day when temperature and pH were measured. The lowest 99.9% 30-day average CCC was 2.56 mg/L during this period. The 4-day average CCC is derived in accordance with the USEPA criteria document as 2.5 times the 30-day CCC. Based on the 30-day average CCC of 2.56 mg/L (as N), the 4-day average CCC that should not be exceeded is 6.40 mg/L (as N).

The Regional Water Board calculates WQBELs in accordance with SIP procedures for non-CTR constituents, and ammonia is a non-CTR constituent. The SIP procedure assumes a 4-day averaging period for calculating the long-term average discharge condition (LTA). However, USEPA recommends modifying the procedure for calculating permit limits for ammonia using a 30-day averaging period for the calculation of the LTA corresponding to the 30-day chronic criterion. Therefore, while the LTAs corresponding to the acute and 4-day chronic criteria were calculated according to SIP procedures, the LTA corresponding to the 30-day chronic criterion was calculated assuming a 30-day averaging period. The lowest LTA representing the acute, 4-day average chronic, and 30-day chronic criteria is then selected for deriving the AMEL and the MDEL. The remainder of the WQBEL calculation for ammonia was performed according to the SIP procedures. This Order contains a final AMEL and MDEL for ammonia of 1.3 mg/L and 3.2 mg/L, respectively, based on USEPA's *National Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life* (see Attachment F, Table F-6 for the WQBEL calculations for ammonia).

f. **Bis (2-ethylhexyl) phthalate.** Bis (2-ethyl-hexyl) phthalate is used primarily as one of several plasticizers in polyvinyl chloride (PVC) resins for fabricating flexible vinyl products. According to the Consumer Product Safety Commission, USEPA, and the Food and Drug Administration, these PVC resins are used to manufacture many products, including soft squeeze toys, balls, raincoats, adhesives, polymeric coatings, components of paper and paperboard, defoaming agents, animal glue, surface lubricants, and other products that must stay flexible and noninjurious for the lifetime of their use. The State MCL for bis(2 ethylhexyl)phthalate is 4 µg/l and the USEPA MCL is 6 µg/l. The NTR criterion for Human health protection for consumption of water and aquatic organisms is 1.8 µg/l and for consumption of aquatic organisms only is 5.9 µg/l.

The MEC for bis (2-ethyl-hexyl) phthalate was 53 µg/L, based on 12 samples. Three of the 12 samples detected bis(2-ethylhexyl)phthalate above the water quality criteria of 1.8 µg/l. Early 2007, the Discharger began using a clean

technique to collect and analyze for bis(2-ethylhexyl) phthtalate. Since using the clean technique bis(2-ethylhexyl) phthalate has not been detected in the effluent. Due to the uncertainty in the data from samples collected prior to 2007, a RPA can not be made for bis (2-ethylhexyl) phthalate. This Order requires that the Discharger continue to sample for bis(2-ethylhexyl) phthalate using a clean technique. If the results show concentrations exceeding water quality criteria, this Order may be reopened to establish new effluent limitations.

g. **Chlorine Residual.** The Discharger uses chlorine for disinfection, which is extremely toxic to aquatic organisms. The Discharger uses sodium bisulfite to dechlorinate the effluent prior to discharge to Old Alamo Creek. Due to the existing chlorine use and the potential for chlorine to be discharged, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the Basin Plan's narrative toxicity objective.

   The USEPA Technical Support Document for Water Quality-Based Toxics Control [EPA/505/2-90-001] contains statistical methods for converting chronic (four-day) and acute (one-hour) aquatic life criteria to average monthly and maximum daily effluent limitations based on the variability of the existing data and the expected frequency of monitoring. However, because chlorine is an acutely toxic constituent that can and will be monitored continuously, an average one-hour limitation is considered more appropriate than an average daily limitation. Average one-hour and four-day limitations for chlorine, based on these criteria, are included in this Order.

   The Facility discharges through an outfall to Old Alamo Creek. The chlorine residual limitations required in this Order are protective of aquatic organisms in the undiluted discharge. If compliance is maintained, the Regional Water Board does not anticipate residual chlorine impacts to benthic organisms.

h. **Cyanide.** The CTR includes maximum 1-hour average and 4-day average cyanide criteria of 22 µg/L and 5.2 µg/L, respectively, for the protection of freshwater aquatic life. The MEC for cyanide was 17 µg/L, based on 37 samples. Therefore, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the CTR criteria for cyanide. No dilution is allowed due to periods of no flow in Old Alamo Creek. An AMEL and MDEL for cyanide of 4.1 µg/L and 8.9 µg/L, respectively, are included in this Order based on CTR criteria for the protection of freshwater aquatic life (See Attachment F, Table F-5 for WQBEL calculations). The Discharger is unable to immediately comply with these limitations. Section 2.1 of the SIP allows for compliance schedules within the permit for existing discharges where it is demonstrated that it is infeasible for a Discharger to achieve immediate compliance with a CTR criterion. Using the statistical methods for calculating interim effluent limitations described in Attachment F, Section IV.D.1., an interim performance-based maximum daily limitation of 21 µg/L was calculated.

Section 2.1 of the SIP provides that: "*Based on an existing discharger's request and demonstration that it is infeasible for the discharger to achieve immediate compliance with a CTR criterion, or with an effluent limitation based on a CTR criterion, the RWQCB may establish a compliance schedule in an NPDES permit.*" Section 2.1, further states that compliance schedules may be included in NPDES permits provided that the following justification has been submitted: ..."*(a) documentation that diligent efforts have been made to quantify pollutant levels in the discharge and the sources of the pollutant in the waste stream; (b) documentation of source control measures and/or pollution minimization measures efforts currently underway or completed; (c) a proposal for additional or future source control measures, pollutant minimization actions, or waste treatment (i.e., facility upgrades); and (d) a demonstration that the proposed schedule is as short as practicable.*" The Discharger provided this information on 15 February 2007. The new water quality-based effluent limitations for cyanide become effective on **18 May 2010**.

This Order requires the Discharger to submit a corrective action plan and implementation schedule to assure compliance with the final cyanide effluent limitations. The interim effluent limitations are in effect through **17 May 2010**. As part of the compliance schedule for cyanide, the Discharger shall develop and implement a pollution prevention program in compliance with CWC section 13263.3(d)(3) and submit an engineering treatment feasibility study.

The Discharger has been collecting data since June 2001 on influent and effluent cyanide concentrations. The majority of the results for influent cyanide are non-detect. Similar results at other wastewater treatment plants also show no influent cyanide concentrations, but effluent concentrations exceed water quality objectives. The Discharger is studying whether the chlorination/dechlorination of effluent produces compounds that interfere with the cyanide laboratory analysis that create false positives and/or whether cyanides are released in the treatment process. Should the Discharger provide new information based on its cyanide study that warrants a change to the cyanide effluent limitations, this Order may be reopened to modify or remove the effluent limitations for cyanide.

i. **Chlorodibromomethane.** The CTR includes a chlorodibromomethane criterion of 0.41 µg/L for the protection of human health and is based on a one-in-a-million cancer risk for waters from which both water and organisms are consumed. The MEC for chlorodibromomethane was 14 µg/L, based on 36 samples. Therefore, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the CTR criterion for chlorodibromomethane.

No chlorodibromomethane has been detected in the receiving water. However, the lowest detection level of the receiving water chlorodibromomethane concentrations at RSW-003 is <0.5 µg/L, which is greater than the CTR criterion. Therefore, no assimilative capacity for chlorodibromomethane is available and the dilution credit of 1.1 could not be used in developing WQBELs for chlorodibromomethane for the protection of the applicable MUN use in New

Alamo Creek. This Order includes an AMEL and MDEL for chlorodibromomethane of 0.41 µg/L and 0.86 µg/L, respectively, based on the CTR criterion for the protection of human health (See Attachment F, Table F-5 for WQBEL calculations).

The Discharger is unable to immediately comply with these new effluent limitations. Section 2.1 of the SIP allows for compliance schedules within the permit for existing discharges where it is demonstrated that it is infeasible for a Discharger to achieve immediate compliance with a CTR criterion. Using the statistical methods for calculating interim effluent limitations described in Attachment F, Section IV.D.1., an interim performance-based maximum daily limitation of 14 µg/L was calculated.

Section 2.1 of the SIP provides that: "*Based on an existing discharger's request and demonstration that it is infeasible for the discharger to achieve immediate compliance with a CTR criterion, or with an effluent limitation based on a CTR criterion, the RWQCB may establish a compliance schedule in an NPDES permit.*" Section 2.1, further states that compliance schedules may be included in NPDES permits provided that the following justification has been submitted: ..."*(a) documentation that diligent efforts have been made to quantify pollutant levels in the discharge and the sources of the pollutant in the waste stream; (b) documentation of source control measures and/or pollution minimization measures efforts currently underway or completed; (c) a proposal for additional or future source control measures, pollutant minimization actions, or waste treatment (i.e., facility upgrades); and (d) a demonstration that the proposed schedule is as short as practicable.*" The Discharger provided this information on 15 February 2007. The new water quality-based effluent limitations for chlorodibromomethane become effective on **18 May 2010**.

This Order requires the Discharger to submit a corrective action plan and implementation schedule to assure compliance with the final chlorodibromomethane effluent limitations. The interim effluent limitations are in effect through **17 May 2010**. As part of the compliance schedule for chlorodibromomethane, the Discharger shall develop and implement a pollution prevention program in compliance with CWC section 13263.3(d)(3) and submit an engineering treatment feasibility study.

j. **Dichlorobromomethane.** The CTR includes a dichlorobromomethane criterion of 0.56 µg/L for the protection of human health and is based on a one-in-a-million cancer risk for waters from which both water and organisms are consumed. The MEC for dichlorobromomethane was 43 µg/L, based on 36 samples. Therefore, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the CTR criterion for dichlorobromomethane.

No dichlorobromomethane has been detected in the receiving water. The lowest detection level of the receiving water dichlorobromomethane concentrations at RSW-003 is <0.5 µg/L; therefore, some assimilative capacity for

dichlorobromomethane is available. The minimum available dilution credit of 1.1 was used in developing effluent limitations for dichlorobromomethane for the protection of the applicable MUN use at New Alamo Creek. This Order includes an AMEL and MDEL for dichlorobromomethane of 0.63 µg/L and 0.99 µg/L, respectively, based on the CTR criterion for the protection of human health (See Attachment F, Table F-5 for WQBEL calculations).

The Discharger is unable to immediately comply with these new effluent limitations. Section 2.1 of the SIP allows for compliance schedules within the permit for existing discharges where it is demonstrated that it is infeasible for a Discharger to achieve immediate compliance with a CTR criterion. Using the statistical methods for calculating interim effluent limitations described in Attachment F, Section IV.D.1., an interim performance-based maximum daily limitation of 43 µg/L was calculated.

Section 2.1 of the SIP provides that: "*Based on an existing discharger's request and demonstration that it is infeasible for the discharger to achieve immediate compliance with a CTR criterion, or with an effluent limitation based on a CTR criterion, the RWQCB may establish a compliance schedule in an NPDES permit.*" Section 2.1, further states that compliance schedules may be included in NPDES permits provided that the following justification has been submitted: ..."*(a) documentation that diligent efforts have been made to quantify pollutant levels in the discharge and the sources of the pollutant in the waste stream; (b) documentation of source control measures and/or pollution minimization measures efforts currently underway or completed; (c) a proposal for additional or future source control measures, pollutant minimization actions, or waste treatment (i.e., facility upgrades); and (d) a demonstration that the proposed schedule is as short as practicable.*" The Discharger provided this information on 15 February 2007. The new water quality-based effluent limitations for dichlorobromomethane become effective on **18 May 2010**.

This Order requires the Discharger to submit a corrective action plan and implementation schedule to assure compliance with the final dichlorobromomethane effluent limitations. The interim effluent limitations are in effect through **17 May 2010**. As part of the compliance schedule for dichlorobromomethane, the Discharger shall develop and implement a pollution prevention program in compliance with CWC section 13263.3(d)(3) and submit an engineering treatment feasibility study.

k. **Electrical Conductivity. (see Subsection s. Salinity)**

l. **Mercury.** The current USEPA Ambient Water Quality Criteria for Protection of Freshwater Aquatic Life, continuous concentration, for mercury is 0.77 µg/L (30-day average, chronic criteria). The CTR contains a human health criterion (of 0.050 µg/L for waters from which both water and aquatic organisms are consumed. Both values are controversial and subject to change. In 40 CFR Part 131, USEPA acknowledges that the human health criteria may not be protective

of some aquatic or endangered species and that "*...more stringent mercury limits may be determined and implemented through use of the State's narrative criterion.*" In the CTR, USEPA reserved the mercury criteria for freshwater and aquatic life and may adopt new criteria at a later date. The MEC for mercury was 0.0059 µg/L. The northwestern portion of the Delta, which includes Ulatis Creek downstream of the discharge has been listed as an impaired water body pursuant to Section 303(d) of the Clean Water Act because of mercury. Mercury bioaccumulates in fish tissue and, therefore, discharge of mercury to the receiving water is likely to contribute to exceedances of the narrative toxicity objective and impacts on beneficial uses. Because the northwestern portion of the Delta, which contains Ulatis creek downstream of the discharge has been listed as an impaired water body for mercury, the discharge must not cause or contribute to increased mercury levels. The SIP, Section 1.3, requires the establishment of an effluent limitation for a constituent when the receiving stream background water quality exceeds an applicable criterion or objective. This Order carries forward the interim performance-based mass Effluent Limitation of 2.1 lbs/year for mercury from the previous Order No. 5-01-044. This limitation is based on maintaining the mercury loading at the current level until a total maximum daily load (TMDL) can be established and/or USEPA develops mercury standards that are protective of human health.

m. **Nitrite and Nitrate.** Untreated domestic wastewater contains ammonia. Nitrification is a biological process that converts ammonia to nitrite and nitrite to nitrate. Denitrification is a process that converts nitrate to nitrite or nitric oxide and then to nitrous oxide or nitrogen gas, which is then released to the atmosphere. Nitrate and nitrite are known to cause adverse health effects in humans. The California DHS has adopted Primary MCLs at Title 22 of the California Code of Regulations (CCR), Table 64431-A, for the protection of human health for nitrite and nitrate that are equal to 1 mg/L and 10 mg/L (measured as nitrogen), respectively. Title 22 CCR, Table 64431-A, also includes a primary MCL of 10mg/L for the sum of nitrate and nitrite, measured as nitrogen.

   USEPA has developed a primary MCL and an MCL goal of 1 mg/L for nitrite (as nitrogen). For nitrate, USEPA has developed Drinking Water Standards (10 mg/L as Primary Maximum Contaminant Level) and Ambient Water Quality Criteria for protection of human health (10 mg/L for non-cancer health effects).

   Inadequate or incomplete denitrification may result in the discharge of nitrate and/or nitrite to the receiving stream. The conversion of ammonia to nitrites and the conversion of nitrites to nitrates present a reasonable potential for the discharge to cause or contribute to an in-stream excursion above the Primary MCLs for nitrite and nitrate. However, the MEC for nitrite was <0.050 mg/L, based on 18 samples , and the MEC for nitrate was 27 mg/L, based on 36 samples. Therefore, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the MCL for nitrate, but not nitrite.

The minimum available dilution credit of 1.1 was used in developing the end-of-pipe effluent limitation for nitrate for the protection of the applicable MUN use at New Alamo Creek. Additionally, nitrate was detected at a concentration of 3.9 mg/L in New Alamo Creek upstream from the discharge. Therefore, some assimilative capacity is available. An AMEL of 17 mg/L for nitrate is included in this Order based on protection of the Basin Plan's narrative chemical constituents objective to assure the treatment process adequately nitrifies and denitrifies the waste stream to protect the beneficial use of municipal and domestic supply. Based on the sample results in the effluent, the limitations appear to put the Discharger in immediate non-compliance. New or modified control measures may be necessary in order to comply with the effluent limitations, and the new or modified control measures cannot be designed, installed and put into operation within 30 calendar days. Furthermore, the effluent limitations for nitrate are a new regulatory requirement within this permit, which becomes applicable to the waste discharge with the adoption of this Order, which was adopted after July 1, 2000. Therefore, a compliance time schedule for compliance with the nitrate effluent limitations is established in TSO No. R5-2007-0056 in accordance with CWC section 13300, that requires preparation and implementation of a pollution prevention plan in compliance with CWC section 13263.3.

n. **Pathogens**. The beneficial uses of Old Alamo Creek include, water contact recreation, and agricultural irrigation supply, and the downstream flow of Old Alamo Creek from the Facility is typically dominated by the treated wastewater discharge, absent the discharge, is an ephemeral stream. There is relatively little, if any, dilution provided from the upstream flow during the dry season, certainly most of the time, less than 20:1 dilution. Further downstream, Old Alamo Creek runs into New Alamo Creek. The beneficial uses of New Alamo Creek include MUN, AGR, and REC-1 and REC-2. Based on dilution studies conducted in November 2003, March 2004, and July 2004, the minimum dilution available in New Alamo Creek on July 2004, when the beneficial uses of AGR and REC-1 or REC-2 would be more prevalent, was found to be 3.3:1, and on November 2003 and March 2004 the available minimum dilutions were even less, 1.1:1 and 1.4:1 respectively. To protect these beneficial uses, the Regional Water Board finds that the wastewater must be disinfected and adequately treated to prevent disease. The principal infectious agents (pathogens) that may be present in raw sewage may be classified into three broad groups: bacteria, parasites, and viruses. Tertiary treatment, consisting of chemical coagulation, sedimentation, and filtration, has been found to remove approximately 99.5% of viruses. Filtration is an effective means of reducing viruses and parasites from the waste stream. The wastewater must be treated to Title 22 tertiary standards (filtered), or equivalent, from 1 May to 31 October to protect contact recreational and food crop irrigation uses.

The California Department of Health Services (DHS) has developed reclamation criteria, CCR, Division 4, Chapter 3 (Title 22), for the reuse of wastewater. Title

22 requires that for spray irrigation of food crops, parks, playgrounds, schoolyards, and other areas of similar public access, wastewater be adequately disinfected, oxidized, coagulated, clarified, and filtered, and that the effluent total coliform levels not exceed 2.2 MPN/100 mL as a 7-day median. As coliform organisms are living and mobile, it is impracticable to quantify an exact number of coliform organisms and to establish weekly average limitations. Instead, coliform organisms are measured as a most probable number and regulated based on a 7-day median limitation.

Title 22 also requires that recycled water used as a source of water supply for non-restricted recreational impoundments be disinfected tertiary recycled water that has been subjected to conventional treatment. A non-restricted recreational impoundment is defined as "*...an impoundment of recycled water, in which no limitations are imposed on body-contact water recreational activities.*" Title 22 is not directly applicable to surface waters; however, the Regional Water Board finds that it is appropriate to apply an equivalent level of treatment to that required by DPH's reclamation criteria because the receiving water is used seasonally for irrigation of agricultural land and for contact recreation purposes, generally from 1 May to 31 October. The stringent disinfection criteria of Title 22 are appropriate since the undiluted effluent may be used for the irrigation of food crops and/or for body-contact water recreation. Coliform organisms are intended as an indicator of the effectiveness of the entire treatment train and the effectiveness of removing other pathogens. The method of treatment is not prescribed by this Order; however, wastewater must be treated to a level equivalent to that recommended by DHS.

In addition to coliform testing, a turbidity effluent limitation has been included as a second indicator of the effectiveness of the treatment process and to assure compliance with the required level of treatment. The tertiary treatment process, or equivalent, is capable of reliably meeting a turbidity limitation of 2 nephelometric turbidity units (NTU) as a daily average. Failure of the filtration system such that virus removal is impaired would normally result in increased particles in the effluent, which result in higher effluent turbidity. Turbidity has a major advantage for monitoring filter performance, allowing immediate detection of filter failure and rapid corrective action. Coliform testing, by comparison, is not conducted continuously and requires several hours, to days, to identify high coliform concentrations. Therefore, to ensure compliance with the DHS recommended Title 22 disinfection criteria, weekly average effluent limitations are impracticable for turbidity.

The Discharger evaluated the public health risks of its wastewater effluent and presented the revised final report, "Evaluation of Public Health Risks Concerning Infectious Disease Agents Associated with Exposure to Treated Wastewater Discharged by the City of Vacaville, Easterly Wastewater Treatment Plant", August 2001 (Revised January 2002). Based on a review and the report, the Department of Public Health, North Coastal Region, Drinking Water Field

Operations Branch, Division of Drinking Water and Environmental Management, in a letter dated 22 March 2002, concluded tertiary filtration is appropriate and necessary during the dry weather period for public health protection. However, during winter months when the beneficial uses of agricultural irrigation and contact recreational activities do not occur, secondary treatment with disinfection to 23 MPN is adequate for public health protection. Therefore, Title 22 disinfection criteria for a peak hourly dry weather flow (27 mgd) is required to protect agricultural irrigation and contact recreation during the dry weather period. The Department of Health Services (now the Department of Public Health) decided the dry months for the Vacaville area are May 1 through October 31st. From November 1 through April 30th, secondary treatment to 23 MPN/100mL monthly median is adequate protection of the beneficial uses.

This Order contains effluent limitations and a tertiary level of treatment, or equivalent, from 1 May – 31 October, to protect the beneficial uses of the receiving water. In accordance with CWC section 13241, the Regional Water Board has considered the following:

i. The past, present and probable future beneficial uses of the receiving streams (Old and New Alamo Creeks) which include, agricultural irrigation, agricultural stock watering, industrial process water supply, industrial service supply, body contact water recreation, other non-body contact water recreation, warm freshwater aquatic habitat, warm fish migration habitat, warm spawning habitat, and wildlife habitat. And the following additional uses for New Alamo Creek, municipal and domestic supply, cold freshwater aquatic habitat, and cold fish migration habitat.

ii. The environmental characteristics of the hydrographic unit, including the quality of the available water, will be improved by the requirement to provide tertiary treatment for this wastewater discharge. Tertiary treatment will allow for the reuse of the undiluted wastewater for food crop irrigation and contact recreation activities that would otherwise be unsafe according to recommendations from the California Department of Public Health (DPH).

iii. Fishable and swimmable water quality conditions can be reasonably achieved through the coordinated control of all factors that affect water quality in the area.

iv. The economic impact of requiring an increased level of treatment has been considered. The Discharger has estimated that the increased level of treatment will cost approximately $40 million. The loss of beneficial uses within downstream waters, without the tertiary treatment requirement, which includes prohibiting the irrigation of food crops and prohibiting public access for contact recreational purposes, would have a detrimental economic impact. In addition to pathogen removal to protect irrigation and recreation, tertiary

treatment may also aid in meeting discharge limitations for other pollutants, such as heavy metals, reducing the need for advanced treatment specific for those pollutants.

v. The requirement to provide tertiary treatment for this discharge will not adversely impact the need for housing in the area. The potential for developing housing in the area will be facilitated by improved water quality, which protects the contact recreation and irrigation uses of the receiving water. DPH recommends that, in order to protect the public health, relatively undiluted wastewater effluent must be treated to a tertiary level for contact recreational and food crop irrigation uses. Without tertiary treatment, the downstream waters could not be safely utilized for contact recreation or the irrigation of food crops.

vi. It is the Regional Water Board's policy, (Basin Plan, page IV-12.00, Policy 2) to encourage the reuse of wastewater. The Regional Water Board requires dischargers to evaluate how reuse or land disposal of wastewater can be optimized. The need to develop and use recycled water is facilitated by providing a tertiary level of wastewater treatment that will allow for a greater variety of uses in accordance with CCR, Title 22.

vii. The Regional Water Board has considered the factors specified in CWC section 13263, including considering the provisions in CWC section 13241, in adopting the disinfection and filtration requirements under Title 22 criteria. The Regional Water Board finds, on balance, that these requirements are necessary to protect the beneficial uses of Old and New Alamo Creeks, including water contact recreation and irrigation uses.

The establishment of tertiary limitations has been previously required for this discharge; however, the State Board stayed the compliance schedule. Therefore, a new schedule for compliance with the tertiary treatment requirements is included in Special Provisions VI.C.7.a. of this Order. This Order provides interim effluent limitations for BOD, TSS, and total coliform, which the Discharger is currently capable of meeting. Full compliance with the final effluent limitations for BOD, TSS, total coliform, and turbidity are not required by this Order until **1 May 2015**.

o. **pH.** The Basin Plan includes a water quality objective for surface waters (except for Goose Lake) that the "*...pH shall not be depressed below 6.5 nor raised above 8.5. Changes in normal ambient pH levels shall not exceed 0.5 in fresh waters with designated COLD or WARM beneficial uses.*" Effluent Limitations for pH are included in this Order based on the Basin Plan objectives for pH.

p. **Salinity.** The discharge contains total dissolved solids (TDS), chloride, sulfate, and electrical conductivity (EC). These are water quality parameters that are indicative of the salinity of the water. Their presence in water can be growth limiting to certain agricultural crops and can affect the taste of water for human