

30-day CCC. Based on a 30-day CCC of 1.46 mg/L (as N), the 4-day average concentration that should not be exceeded is 3.65 mg/L (as N).

The MEC for ammonia was 4.9 mg/L. Therefore, ammonia in the discharge has a reasonable potential to cause or contribute to an in-stream excursion above a level necessary to protect aquatic life resulting in a violation of the Basin Plan's narrative toxicity objective.

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 criteria. 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 criteria was calculated assuming a 30-day averaging period. The lowest LTA representing the acute, 4-day, 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 10.1 mg/L and 30 mg/L, respectively, based on USEPA's National Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life and to assure the treatment process adequately nitrifies the waste stream to protect the aquatic habitat beneficial uses. Based on the Discharger's effluent data, it is feasible for the Discharger to comply immediately with these limitations.

Research has demonstrated that ammonia can inhibit growth of marine diatoms at ammonia concentrations in the receiving water much lower than ammonia concentrations that impact fish species. Studies are in progress examining possible impacts of ammonia on growth of fresh water diatoms that exist in the Delta in the vicinity of this discharge. The Delta has a relative low primary productivity for an estuarine environment. If ammonia inhibition of fresh water diatoms does occur, it is possible that lowered primary productivity from diatom inhibition could be a contributing factor to Delta aquatic problems. If ammonia inhibition of diatoms is confirmed, this permit will be reopened to reconsider the ammonia effluent limitation.

- g. Copper.** The CTR includes hardness-dependent criteria for the protection of freshwater aquatic life for copper. The criteria for copper are presented in dissolved concentrations. USEPA recommends conversion factors to translate dissolved concentrations to total concentrations. The USEPA default conversion factors for copper in freshwater are 0.96 for both the acute and the chronic criteria. Using the worst-case measured hardness from the effluent and receiving water and the USEPA recommended dissolved-to-total translator, the applicable chronic criterion (maximum four-day average concentration) is 17.2 µg/L and the applicable acute criterion (maximum one-hour average

concentration) is 27.4 µg/L, as total recoverable.

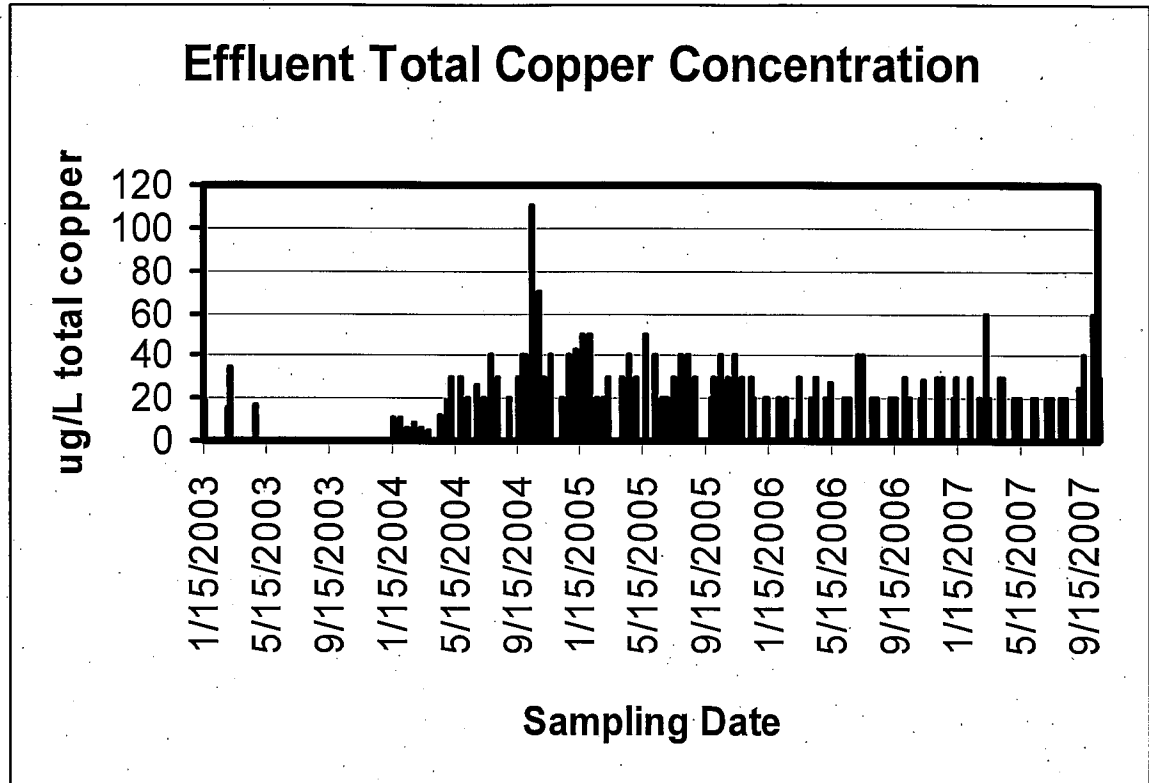
The MEC for total copper was 110 µg/L, based on 101 samples collected between 1/15/03 and 10/10/07, while the maximum observed upstream receiving water total copper concentration was 2.9 µg/L, based on 13 samples collected between 1/28/04 and 12/22/04. Therefore, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the CTR criteria for copper. Calculated using an acute dilution credit of 13.2 and a chronic dilution credit of 23, an AMEL and MDEL for total copper of 172 µg/L and 323 µg/L, respectively, are the resulting effluent limitations based on CTR criteria for the protection of freshwater aquatic life (See Attachment F, Table F-8 for WQBEL calculations).

The copper effluent limitations based on CTR criteria are hardness dependent. The Basin Plan Table III-1 contains a site specific criterion of 10 µg/L for copper, which is independent of hardness. Using the USEPA recommended dissolved-to-total translator, the site-specific water quality objective is 10.4 µg/L as total recoverable copper. The MDEL calculated using this criterion of 10.4 µg/L, a dilution factor of 23, and using the procedure given by section 1.4 of the SIP, results in a limit more stringent than the MDEL calculated from the CTR criterion, as shown by the following equation.

Effluent Concentration Allowance =  $C + D(C-B)$ ,  
where C is the criterion,  
D is the dilution credit, and  
B is the background concentration.

Here,  $ECA = 10.4 + 23(10.4 - 5) = 135 \mu\text{g/L}$ . Therefore, a final effluent for copper of 135 µg/L as a maximum daily effluent limitation could be established, but almost the entire assimilative capacity of the receiving water would be used.

**Table F-4. Effluent Total Copper Concentration**



The above chart graphs effluent total copper concentrations for the time period being evaluated. It is apparent that the Discharger can comply with effluent copper limitations more stringent than calculated from either the CTR or Basin Plan water quality objectives. Given both the continuing problems with aquatic life in the Delta, and the federal and state Anti-Degradation Policies, effluent limitations for toxic constituents should be set as low as practical, even if higher concentrations would not result in toxic conditions in the receiving water. Based upon examination of the above chart, and using Best Professional Judgment, the Average Monthly Effluent Limitation is set at 50 ug/L, and the Maximum Daily Effluent Limitation is set at 70 ug/L.

**h. Electrical Conductivity. (see Subsection p. Salinity)**

**i. Iron.** The Secondary MCL - Consumer Acceptance Limit for iron is 300 µg/L. The Basin Plan at Table III-1 also requires a site specific criterion for iron of 300 µg/L. The MEC for iron was 350 µg/L, based on 11 samples collected between 1/1/04 and 7/31/07. The maximum effluent annual average concentration was 138 µg/L, based on monitoring results. The maximum observed upstream receiving water iron concentration was 1300 µg/L, based on 3 samples collected between 1/15/03 and 4/23/03. Therefore, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the Secondary MCL for iron. Therefore, an annual average effluent limit of 300 µg/L for iron is included in this Order based on protection of the Basin Plan's narrative chemical

constituents objective. Based on the sample results in the effluent, it appears the Discharger can meet this new limitation.

- j. Manganese.** Table III-1 of the Basin Plan establishes a water quality criterion of 50 µg/L, applicable to the Delta, for manganese. In addition, the Regional Water Board considers the receiving water to be compliant with the Basin Plan's narrative water quality objective for chemical constituents when manganese concentrations are below the secondary MCL for manganese.

The MEC for manganese was 123 µg/L, based on 5 samples collected between 1/15/03 and 1/11/06. The four other sample results were 16 mg/L, 31 mg/L, 15 mg/L, and 10 mg/L. Three effluent sample events occurred in 2003, which resulted in an annual average of 20.7 µg/L (16, 31, and 15 mg/L respectively), one sample event in 2005 resulted in an effluent concentration of 123 µg/L, and one sample event in 2006 resulted in an effluent concentration of 10 µg/L. The maximum observed upstream receiving water manganese concentration was 40 µg/L, based on 3 samples collected between 1/15/03 and 4/23/03.

With the exception of the single 123 µg/L result, effluent manganese concentrations have consistently been below the 50 µg/L water quality objective. The 123 µg/L sample is inconsistent with the other results, and it is unlikely that a domestic wastewater would have that significant a change in effluent manganese for a single sample. The 123 µg/L result is considered to be an outlier and is not included in the reasonable potential analysis. Effluent limitations are not being established at this time. Monitoring of the effluent is required in order to determine if the discharge has a reasonable potential to cause, or contribute to an excursion above any state water quality standard.

- k. 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 10,000 µg/L for the sum of nitrate and nitrite, measured as nitrogen.

For nitrate, USEPA has developed Drinking Water Standards (10,000 µg/L as Primary Maximum Contaminant Level) and Ambient Water Quality Criteria for protection of human health (10,000 µg/L for non-cancer health effects). Recent toxicity studies have indicated a possibility that nitrate is toxic to aquatic organisms.

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. Nitrate was detected in 103 samples from 1/14/04 – 10/10/07, with a maximum of 91 mg/L as N on 6/8/05. Therefore there is reasonable potential for nitrate to exceed the most stringent objective, and an AMEL of 73 mg/L and an MDEL of 126 mg/L nitrate as N are included in this Order based on the MCL and calculated with a dilution credit of 13.2. These effluent limitations are included in this Order to assure the treatment process adequately nitrifies and denitrifies the waste stream to protect the beneficial use of municipal and domestic supply.

- I. Pathogens.** The beneficial uses of Old River include municipal and domestic supply, water contact recreation, and agricultural irrigation supply. Coliform limits are imposed to protect the beneficial uses of the receiving water, including public health through contact recreation and drinking water pathways. In a letter to the Regional Water Board dated 8 April 1999, the California Department of Health Services (now Department of Public Health) indicated that DHS would consider wastewater discharged to water bodies with identified beneficial uses of irrigation or contact recreation and where the wastewater receives dilution of more than 20:1 to be adequately disinfected if the effluent coliform concentration does not exceed 23 MPN/100 mL as a 7-day median and if the effluent coliform concentration does not exceed 240 MPN/100 mL more than once in any 30 day period. Furthermore, the DHS provided a letter dated 1 July 2003 that included clarification of the recommendations. The letter states, "*A filtered and disinfected effluent should be required in situations where critical beneficial uses (i.e. food crop irrigation or body contact recreation) are made of the receiving waters unless a 20:1 dilution ration (DR) is available. In these circumstances, a secondary, 23 MPN discharge is acceptable.*" This Order is consistent with these recommendations, considering site-specific factors. Therefore, the 23 MPN/100 mL limitation is found to be appropriate, and is retained from the previous permit. The coliform effluent limitations are adequately protective of the water contact recreation and agricultural irrigation supply beneficial uses of the receiving water in the vicinity of the discharge. In addition, for MUN-designated water bodies, DPH has not recommended treatment beyond secondary with 20:1 dilution, or tertiary without 20:1 dilution, where there were no known users of untreated water near a treatment plant outfall. Based on a review of the State Water Boards eWRIMS water rights database, there is no evidence of the untreated domestic use of the raw water in the vicinity of the discharge. Therefore, the coliform effluent limitations are also adequately protective of the MUN use.
- m. 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.
- n. Salinity.** The State Water Resources Control Board has established salinity standards in the *Water Quality Control Plan for the San Francisco Bay*,

*Sacramento-San Joaquin Delta Estuary.* The State Water Board prescribed numeric chloride and electrical conductivity standards to protect agricultural irrigation at several locations in the Delta, including in the West Canal at Mouth of Clifton Court Forebay (the entrance to the State Water Project canal). This location is south of the discharge location along Old River, which is the "downstream" direction of Old River during irrigation and low flow seasons in the Delta. The salinity objective for West Canal is 1000  $\mu\text{mhos/cm}$  year around for electrical conductivity and 250 mg/L for chloride. The 2006 update of the Bay Delta Plan clarified that the numeric objectives are not just applicable at the compliance monitoring locations, but "unless otherwise indicated, water quality objectives cited for a general area, such as for the southern Delta, are applicable for all locations in that general area and compliance locations will be used to determine compliance with the cited objectives." The West Canal compliance location is in the general area of the Discovery Bay discharge, and the compliance location is "downstream" of the Discovery Bay discharge during critical Delta flow conditions. Therefore, the numeric electrical conductivity and chloride objectives for the West Canal compliance location is applicable to the receiving waters into which Discovery Bay discharges.

- i. **Chloride.** The Bay-Delta Plan objective for the West Canal at Mouth of Clifton Court Forebay (the entrance to the State Water Project canal) is included in this Order. The maximum mean daily value shall not exceed 250 mg/L to protect Municipal and Industrial uses of the receiving water.

Chloride concentrations in the effluent ranged from 277 mg/L to 400 mg/L, with an average of 330 mg/L, for 104 samples collected by the Discharger from 1/14/04 through 10/10/07. The maximum background concentration of chloride in Old River upstream of the discharge was 164 mg/L.

- ii. **Electrical Conductivity (EC).** The Basin Plan objective for the West Canal at Mouth of Clifton Court Forebay (the entrance to the State Water Project canal) is included in this Order. The maximum monthly average of daily mean values shall not exceed 1000  $\mu\text{mhos/cm}$  to protect Agricultural uses of the receiving water.

A review of the Discharger's monitoring reports from 1/14/04 through 10/10/07 shows an average effluent EC of 1921  $\mu\text{mhos/cm}$ , with a range of 724 to 2280  $\mu\text{mhos/cm}$  for 91 samples. The maximum background EC level in the receiving water upstream from the discharge was 735  $\mu\text{mhos/cm}$ . The EC of the effluent, receiving water and source water all exceed the mos water quality objective at the entrance to the State Water Project (1000  $\mu\text{mhos/cm}$ ). However, the EC of the wastewater effluent is often at least 500  $\mu\text{mhos/cm}$  above that of the source water. These data show that the receiving water frequently has no assimilative capacity for EC, and that the discharge likely contains controllable salt sources.

- iii. Total Dissolved Solids (TDS).** The secondary MCL for TDS is 500 mg/L as a recommended level, 1000 mg/L as an upper level, and 1500 mg/L as a short-term maximum.

The average TDS effluent concentration was 1114 mg/L and a ranged from 80 mg/L to 1440 mg/L for 91 samples collected by the Discharger from 1/14/04 through 10/10/07. The maximum effluent TDS concentration exceeds all but the least stringent TDS water quality objective to protect MUN use. The maximum background receiving water concentration of TDS upstream of the discharge was 435 mg/L, so there is assimilative capacity in the receiving water to protect the MUN use. The range of source water concentrations of TDS was 540 – 580 mg/L. The wastewater effluent concentrations were often at least 500 mg/L greater than the source water concentrations, indicating that the discharge contains controllable sources of salts. It is generally not necessary to prescribe effluent limits for every salinity species if one salinity constituent is being regulated. This Permit establishes limits for, electrical conductivity adequate to regulate salinity issues. Therefore an effluent limitation for TDS is not necessary to protect water quality and is therefore not prescribed.

- iv. Salinity Effluent Limitations.** Effluent limitations based on the MCL, the agricultural water quality goal, or the Basin Plan would likely require construction and operation of a reverse osmosis treatment plant. The State Water Board, in Water Quality Order 2005-005 (for the City of Manteca), states, "*...the State Board takes official notice [pursuant to Title 23 of California Code of Regulations, Section 648.2] of the fact that operation of a large-scale reverse osmosis treatment plant would result in production of highly saline brine for which an acceptable method of disposal would have to be developed. Consequently, any decision that would require use of reverse osmosis to treat the City's municipal wastewater effluent on a large scale should involve thorough consideration of the expected environmental effects.*" The State Water Board states in that Order, "*Although the ultimate solution to southern Delta salinity problems have not yet been determined, previous actions establish that the State Board intended for permit limitations to play a limited role with respect to achieving compliance with the EC water quality objectives in the southern Delta.*" The State Water Board goes on to say, "*Construction and operation of reverse osmosis facilities to treat discharges...prior to implementation of other measures to reduce the salt load in the southern Delta, would not be a reasonable approach.*" In addition, the State Water Board expressed concerns about costs of reverse osmosis; the same considerations apply to this Facility.

The Regional Water Board, with cooperation of the State Water Board, has begun the process to develop a new policy for the regulation of salinity in the Central Valley. In a statement issued at the 16 March 2006, Regional Water Board meeting, Board Member Dr. Karl Longley recommended that the Regional Water Board continue to exercise its authority to regulate

discharges of salt to minimize salinity increases within the Central Valley. Dr. Longley stated, "*The process of developing new salinity control policies does not, therefore, mean that we should stop regulation salt discharges until a possible interim approaches to continue controlling and regulating salts in a reasonable manner, and encourage all stakeholder groups that may be affected by the Regional Board's policy to actively participate in policy development.*"

As previously described, effluent data for EC, chloride, and TDS indicate that effluent concentrations continue to be at levels of concern that may affect beneficial uses of the Old River. Therefore, this Order includes an annual average performance-based effluent limitation of 2100  $\mu\text{mhos/cm}$  for EC to protect the receiving water from further salinity degradation, based on the highest annual average effluent concentration. However, should the Discharger fail to implement the provisional requirements specified in Provision VI.C.3.c of this Order, then this Order requires the Discharger to comply with the monthly average EC effluent limits of 1000  $\mu\text{mhos/cm}$ , which are based on the Bay-Delta Plan water quality objectives for this geographical location. The Bay-Delta objectives are under review, but when or if the salinity objectives will be changed is unknown. The Regional Water Board must implement water quality objectives as they exist at this time.

Compliance with these effluent limitations and the requirements of Provision VI.C.3.a will result in a salinity reduction in the effluent discharged to the receiving water; however, the discharge may cause or contribute to an exceedance of a water quality objective for salinity until adequate measures are implemented to meet those objectives.

EC is an indicator parameter for salinity, as is chloride and TDS. Establishing an effluent limitation for EC is expected to effectively control the constituents that contribute to salinity, including TDS and chloride. Therefore, the effluent limits for chloride and TDS were not carried forward from the previous Order. Removal of the effluent limitations is consistent with the antibacksliding regulations, because this Order includes controls for effluent salinity. The removal of the effluent limitations also meets state and federal antidegradation requirements, because even the performance-based effluent EC limitation (2,100  $\mu\text{mhos/cm}$ ) is more stringent than the previous Order, which will result in lower concentrations of chloride and TDS in the discharge. Monitoring of these constituents has been required to verify that they are effectively controlled using EC as an indicator parameter.

- o. Settleable Solids.** For inland surface waters, the Basin Plan states that "[w]ater shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses." No detectable Settleable Solids were found in the 93 samples analyzed in the period. There is no reasonable potential for causing or contributing to violation of



the Basin Plan objective, so no Settleable Solids effluent limitation is included in this permit.

- p. **Temperature.** The Thermal Plan requires that, "The maximum temperature shall not exceed the natural receiving water temperature by more than 20°F", and "No discharge shall cause a surface water temperature rise greater than 4°F above the natural temperature of the receiving water." Therefore, to ensure compliance with the Thermal Plan, an effluent limitation for temperature is included in this Order.
- q. **Toxicity.** See Section IV.C.5. of the Fact Sheet regarding whole effluent toxicity.

#### 4. WQBEL Calculations

- a. Effluent limitations for ammonia and copper were calculated in accordance with section 1.4 of the SIP. The following paragraphs describe the methodology used for calculating effluent limitations.
- b. **Effluent Limitation Calculations.** In calculating maximum effluent limitations, the effluent concentration allowances were set equal to the criteria/standards/objectives.

$$ECA_{acute} = CMC \qquad ECA_{chronic} = CCC$$

For the human health, agriculture, or other long-term criterion/objective, a dilution credit can be applied. The ECA is calculated as follows:

$$ECA_{HH} = HH + D(HH - B)$$

where:

$ECA_{acute}$  = effluent concentration allowance for acute (one-hour average) toxicity criterion

$ECA_{chronic}$  = effluent concentration allowance for chronic (four-day average) toxicity criterion

$ECA_{HH}$  = effluent concentration allowance for human health, agriculture, or other long-term criterion/objective

CMC = criteria maximum concentration (one-hour average)

CCC = criteria continuous concentration (four-day average, unless otherwise noted)

HH = human health, agriculture, or other long-term criterion/objective

D = dilution credit

B = maximum receiving water concentration

Acute and chronic toxicity ECAs were then converted to equivalent long-term averages (LTA) using statistical multipliers and the lowest is used. Additional statistical multipliers were then used to calculate the maximum daily effluent limitation (MDEL) and the average monthly effluent limitation (AMEL).

Human health ECAs are set equal to the AMEL and a statistical multiplier is used to calculate the MDEL.

$$\begin{aligned}
 & \overbrace{\min(M_A ECA_{acute}, M_C ECA_{chronic})}^{LTA_{acute}} \\
 AMEL &= mult_{AMEL} [\min(M_A ECA_{acute}, M_C ECA_{chronic})] \\
 MDEL &= mult_{MDEL} [\min(M_A ECA_{acute}, M_C ECA_{chronic})] \\
 & \underbrace{\hspace{15em}}_{LTA_{chronic}} \\
 MDEL_{HH} &= \left( \frac{mult_{MDEL}}{mult_{AMEL}} \right) AMEL_{HH}
 \end{aligned}$$

where:  $mult_{AMEL}$  = statistical multiplier converting minimum LTA to AMEL  
 $mult_{MDEL}$  = statistical multiplier converting minimum LTA to MDEL  
 $M_A$  = statistical multiplier converting CMC to LTA  
 $M_C$  = statistical multiplier converting CCC to LTA

Water quality-based effluent limitations were calculated for ammonia and copper, as follows in Tables F-6 through F-10, below.

**Table F-5. WQBEL Calculations for Ammonia**

	Acute	Chronic
pH <sup>(1)</sup>	8.5	7.8
Temperature °C <sup>(2)</sup>	N/A	26.6
Criteria (mg/L) <sup>(3)</sup>	2.14	1.46
Dilution Credit	13.2	23
ECA	30.4	28
ECA Multiplier	0.13	0.52
LTA <sup>(4)</sup>	3.95	14.58
AMEL Multiplier (95 <sup>th</sup> %)	2.56	<sup>(5)</sup>
<b>AMEL (mg/L)</b>	<b>10.1</b>	<sup>(5)</sup>
MDEL Multiplier (99 <sup>th</sup> %)	7.59	<sup>(5)</sup>
<b>MDEL (mg/L)</b>	<b>30</b>	<sup>(5)</sup>

(1) Acute design pH = 8.5 (max. allowed effluent pH), Chronic design pH = median receiving stream pH

(2) Temperature = Maximum 30-day average seasonal effluent temperature

(3) USEPA Ambient Water Quality Criteria

(4) LTA developed based on Acute and Chronic ECA Multipliers calculated at 99th percentile level per sections 5.4.1 and 5.5.4 of TSD.

(5) Limitations based on acute LTA ( $LTA_{chronic} > LTA_{acute}$ )

**Table F-6. WQBEL Calculations for Copper**

	Acute - CTR	Chronic - CTR	Basin Plan
Criteria, dissolved ( $\mu\text{g/L}$ ) <sup>(1)</sup>	27.4	17.2	10.0
Dilution Credit	13.2	23	23
Translator <sup>(2)</sup>	0.96	0.96	0.96
ECA, total recoverable <sup>(3)</sup>	323	297	135
ECA Multiplier <sup>(4)</sup>	0.36	0.57	---
LTA	117	169	---
AMEL Multiplier (95 <sup>th</sup> %) <sup>(5)(6)</sup>	1.47	<sup>(8)</sup>	---
<b>AMEL (<math>\mu\text{g/L}</math>)</b>	<b>172</b>	<sup>(8)</sup>	---
MDEL Multiplier (99 <sup>th</sup> %) <sup>(7)</sup>	2.77	<sup>(8)</sup>	---
<b>MDEL (<math>\mu\text{g/L}</math>)</b>	<b>323<sup>(9)</sup></b>	<sup>(8)</sup>	<b>135</b>

- (1) CTR aquatic life criteria, based on an effluent hardness of 204 mg/L as CaCO<sub>3</sub>.
- (2) EPA Translator used as default.
- (3) ECA calculated per section 1.4.B, Step 2 of SIP. This allows for the consideration of dilution.
- (4) Acute and Chronic ECA Multiplier calculated at 99th percentile per section 1.4.B, Step 3 of SIP or per sections 5.4.1 and 5.5.4 of the TSD.
- (5) Assumes sampling frequency n=>4.
- (6) The probability basis for AMEL is 95th percentile per section 1.4.B, Step 5 of SIP or section 5.5.4 of the TSD.
- (7) The probability basis for MDEL is 99th percentile per section 1.4.B, Step 5 of SIP or section 5.5.4 of the TSD.
- (8) Limitations based on acute LTA (Acute LTA < Chronic LTA)
- (9) MDEL exceeds Basin Plan site-specific objective for copper (10.4  $\mu\text{g/L}$ ), final effluent limitations implement the Basin Plan site-specific objective.

**Table F-7. Summary of Final Water Quality-based Effluent Limitations**

Parameter	Units	Effluent Limitations		
		Average Monthly	Maximum Daily	Annual Average
Ammonia	mg/L	10	30	---
	lbs/day	177	525	--
Copper	$\mu\text{g/L}$	50	70	--
Iron	$\mu\text{g/L}$	---	---	300
Aluminum	$\mu\text{g/L}$	---	---	200
Nitrate (as N)	mg/L	73	126	---
Electrical Conductivity	$\mu\text{mhos/cm}$	1000	---	---

**5. Whole Effluent Toxicity (WET)**

For compliance with the Basin Plan's narrative toxicity objective, this Order requires the Discharger to conduct whole effluent toxicity testing for acute and chronic toxicity, as specified in the Monitoring and Reporting Program (Attachment E, Section V.). This Order also contains effluent limitations for acute toxicity and requires the Discharger to implement best management practices to investigate the causes of, and identify corrective actions to reduce or eliminate effluent toxicity.

**a. Acute Aquatic Toxicity.** The Basin Plan contains a narrative toxicity objective that 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) The Basin Plan also states that, "...effluent limits based upon acute biotoxicity tests of effluents will be prescribed where appropriate..." USEPA Region 9 provided guidance for the development of acute toxicity effluent limitations in the absence of numeric water quality objectives for toxicity in its document titled "Guidance for NPDES Permit Issuance", dated February 1994. In section B.2., *Toxicity Requirements* (pgs. 14-15), it states that, "In the absence of specific numeric water quality objectives for acute and chronic toxicity, the narrative criterion 'no toxics in toxic amounts' applies. Achievement of the narrative criterion, as applied herein, means that ambient waters shall not demonstrate for acute toxicity: 1) less than 90% survival, 50% of the time, based on the monthly median, or 2) less than 70% survival, 10% of the time, based on any monthly median. For chronic toxicity, ambient waters shall not demonstrate a test result of greater than 1 TUc." Accordingly, effluent limitations for acute toxicity have been included in this Order as follows:

**Acute Toxicity.** Survival of aquatic organisms in 96-hour bioassays of undiluted waste shall be no less than:

Minimum for any one bioassays ----- 70%  
Median for any three or more consecutive bioassays ----- 90%

**b. Chronic Aquatic Toxicity.** Based on quarterly whole effluent chronic toxicity testing performed by the Discharger from January 2004 through July 2007, the discharge does not have reasonable potential to cause or contribute to an to an in-stream excursion above of the Basin Plan's narrative toxicity objective.

During the term of the previous Order, the chronic toxicity "trigger" was 1 chronic toxicity unit (TUc). Exceedances of this trigger during the term of the previous Order are described by the following table.

**Table F-8. Chronic Toxicity Monitoring Results Exceeding 1 TUc (2004-2007)**

Date	Test Species	Result (TUc)
April 2005	<i>Selenastrum</i> algae	4.00
April 2005	<i>Ceriodaphnia dubia</i>	2.00
June 2005	<i>Selenastrum</i> algae	1.33
October 2005	<i>Selenastrum</i> algae	4.00
January 2006	<i>Selenastrum</i> algae	4.00
October 2006	<i>Selenastrum</i> algae	2.00
January 2007	<i>Selenastrum</i> algae	8.00
May 2007	<i>Selenastrum</i> algae	1.33
July 2007	<i>Selenastrum</i> algae	2.00

The Discharger conducted a dilution study during this time period, and determined that the worst case chronic dilution ratio for discharge into Old River is 23:1. Based on prior sampling results, the Discharger should not cause chronic toxicity in Old River at a dilution of 23:1, so there is no reasonable potential for chronic toxicity. Therefore, no effluent limitation for chronic toxicity is included in the permit. The current Order also establishes the requirement for a Toxicity Reduction Evaluation, as further described below, should chronic toxicity monitoring results exceed a trigger value of 10 TUc. Based upon the above data, the Discharger can meet a 10 TUc trigger, and exceedance of 10 TUcs would indicate an increase in effluent toxicity that should be evaluated.

To ensure compliance with the Basin Plan's narrative toxicity objective, the Discharger is required to conduct chronic whole effluent toxicity testing, as specified in the Monitoring and Reporting Program (Attachment E, Section V.). Furthermore, Special Provisions VI.C.2.a. of this Order requires the Discharger to investigate the causes of, and identify and implement corrective actions to reduce or eliminate effluent toxicity. If the discharge demonstrates a pattern of toxicity exceeding the numeric toxicity monitoring trigger, the Discharger is required to initiate a Toxicity Reduction Evaluation (TRE), in accordance with an approved TRE work plan. The numeric toxicity monitoring trigger is not an effluent limitation; it is the toxicity threshold at which the Discharger is required to perform accelerated chronic toxicity monitoring, as well as, the threshold to initiate a TRE if a pattern of effluent toxicity has been demonstrated.

#### **D. Final Effluent Limitations**

##### **1. Mass-based Effluent Limitations.**

Title 40 CFR 122.45(f)(1) requires effluent limitations be expressed in terms of mass, with some exceptions, and 40 CFR 122.45(f)(2) allows pollutants that are limited in terms of mass to additionally be limited in terms of other units of measurement. This Order includes effluent limitations expressed in terms of mass and concentration. In addition, pursuant to the exceptions to mass limitations provided in 40 CFR 122.45(f)(1), some effluent limitations are not expressed in terms of mass, such as pH and temperature, and when the applicable standards are expressed in terms of concentration (e.g. CTR criteria and MCLs) and mass limitations are not necessary to protect the beneficial uses of the receiving water.

Mass-based effluent limitations were calculated based upon the permitted average daily discharge flow allowed in Section IV.A.1.a.(5) of the Limitations and Discharge Requirements.

##### **2. Averaging Periods for Effluent Limitations.**

Title 40 CFR 122.45 (d) requires average weekly and average monthly discharge limitations for publicly owned treatment works (POTWs) unless impracticable. However, for toxic pollutants and pollutant parameters in water quality permitting, the USEPA recommends the use of a maximum daily effluent limitation in lieu of

average weekly effluent limitations for two reasons. "First, the basis for the 7-day average for POTWs derives from the secondary treatment requirements. This basis is not related to the need for assuring achievement of water quality standards. Second, a 7-day average, which could comprise up to seven or more daily samples, could average out peak toxic concentrations and therefore the discharge's potential for causing acute toxic effects would be missed." (TSD, pg. 96) This Order utilizes maximum daily effluent limitations in lieu of average weekly effluent limitations for settleable solids, ammonia, copper, nitrate, and Electrical Conductivity for the achievement of water quality standards and for the protection of the beneficial uses of the receiving stream. Furthermore, for BOD, TSS, and pH, weekly average effluent limitations have been replaced or supplemented with effluent limitations utilizing shorter averaging periods. The rationale for using shorter averaging periods for these constituents is discussed in Attachment F, Section IV.C.3., above.

### **3. Satisfaction of Anti-Backsliding Requirements.**

The Clean Water Act specifies that a revised permit may not include effluent limitations that are less stringent than the previous permit unless a less stringent limitation is justified based on exceptions to the anti-backsliding provisions contained in Clean Water Act sections 402(o) or 303(d)(4), or, where applicable, 40 CFR 122.44(j).

Some effluent limitations in this Order are less stringent than those in the previous Order. As discussed below this relaxation of effluent limitations is consistent with the anti-backsliding requirements of the CWA and federal regulations.

In the previous permit, Order No. R5-2003-0067, ambient water quality criteria for ammonia and copper were expressed as "floating" limitations. In this current Order, the fixed effluent limitations for ammonia and copper are less stringent than the effluent limitations of the previous Order because they account for dilution. Anti-backsliding requirements are satisfied, however, pursuant to CWA section 402(o)(2)(B), where the documentation of an actual dilution factor for the receiving water determined during the term of the previous permit, qualifies as new information which was not available at the issuance of the previous permit.

The changes in effluent limits for ammonia and copper in the current permit are based on new information generated during the term of the previous permit, and are consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Resources Control Board Resolution 68-16, as described below.

The previous permit contained effluent limitations for turbidity. The prior limitations were solely an operational check to ensure the treatment system was functioning properly and could meet the limits for solids and coliform. The prior effluent limitations were not intended to regulate turbidity in the receiving water. Rather, turbidity is an operational parameter to determine proper system functioning and not a water quality based limitation.

The revised Order contains performance based operational turbidity specifications to be met prior to disinfection in lieu of effluent limitations. The revised Order does not include effluent limitations for turbidity. However, the performance-based specification in this Order is an equivalent limit that is not less stringent, and therefore does not constitute backsliding.

The proposed revised operational specifications for turbidity are the same as the effluent limitations in the previous permit, with the inclusion of a more stringent requirement for an instantaneous maximum limit at any time. (See Special Provisions C.5. Ultraviolet Disinfection (UV) System Operating Specifications for turbidity specifications.) The proposed revised permit moves the point of compliance from the final effluent after disinfection to an internal compliance point prior to disinfection. These revisions are consistent with state regulations implementing recycled water requirements.

The revision in the turbidity limitation is consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Resources Control Board Resolution 68-16 because this Order imposes equivalent or more stringent requirements than the prior permit and therefore does not allow degradation.

The previous permit contained effluent limitations for aluminum, total residual chlorine, chloroform, cyanide, dibromochloromethane, dichlorobromomethane, lead, mercury, MTBE, MBAS, and zinc. Effluent limitations for these parameters are not contained in the current permit. The Discharger has modified their disinfection system to eliminate the use of chlorine and has changed the discharge location to the Old River.

The deletion of effluent limits for aluminum, total residual chlorine, chloroform, cyanide, dibromochloromethane, dichlorobromomethane, lead, mercury, MTBE, MBAS, and zinc in the current permit are based on new information generated during the term of the previous permit, and are consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Resources Control Board Resolution 68-16

The previous permit contained effluent limitations for chloride and TDS. EC is an indicator parameter for salinity, as is chloride and TDS. Establishing an effluent limitation for EC is expected to effectively control the constituents that contribute to salinity, including TDS and chloride. Therefore, the effluent limits for chloride and TDS were not carried forward from the previous permit. Removal of the effluent limitations is consistent with the antibacksliding regulations, because this Order includes controls for effluent salinity. The removal of the effluent limitations also meets state and federal antidegradation requirements, because the effluent EC limitations are more stringent than the previous permit, which will result in lower concentrations of chloride and TDS in the discharge. Monitoring of these constituents has been required to verify that they are effectively controlled using EC as an indicator parameter.

#### 4. Satisfaction of Antidegradation Policy

- a. **Surface Water.** In accordance with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution 68-16, the water quality of Old River shall be maintained, unless the Regional Water Board finds:
1. That allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located,
  2. That applicable water quality criteria and objectives shall be achieved,
  3. That existing beneficial uses of the receiving water will be fully protected, and
  4. That the highest statutory and regulatory requirements for point source discharges to the receiving water are being achieved; and that all cost-effective and reasonable best management practices for non-point source discharges to the receiving water are being achieved.

This permit does not authorize increased concentrations or loadings of pollutants in the discharge, except for ammonia. Because the discharge complies with each exception above, the increase of ammonia concentrations in the discharge above that of the previous permit satisfies antidegradation requirements. The Regional Water Board finds that the necessity for a wastewater treatment plant for the community allows for lowering receiving water quality as a result of the increased ammonia concentration in the discharge. Secondly, the applicable receiving water criteria and objectives will be achieved, and beneficial uses will be protected. The dilution study conducted during the term of the previous permit demonstrated that granting a dilution credit is appropriate and that the existing beneficial uses of Old River will be fully protected upon the application of the dilution credit. Finally, the Regional Water Board applies the highest statutory and regulatory requirements upon point source dischargers to Old River, and reasonable BMPs are being applied to non-point discharges to the receiving water.

- b. **Groundwater.** The Discharger utilizes sludge disposal lagoons, lined with clay liners. Domestic wastewater contains constituents such as total dissolved solids (TDS), specific conductivity, pathogens, and nitrates. Percolation from the lagoons may result in an increase in the concentration of these constituents in groundwater. The increase in the concentration of these constituents in groundwater must be consistent with Resolution 68-16. The Discharger is required to continue its groundwater monitoring study to comply with the receiving groundwater limits which state that the discharge shall not impact beneficial uses, or cause total coliform bacteria to exceed 2.2 MPN/100 mL over any seven day period. Any increase in pollutant concentrations in groundwater must be shown to be necessary to allow wastewater utility service necessary to accommodate housing and economic expansion in the area and must be consistent with maximum benefit to the people of the State of California. Some degradation of groundwater by the Discharger is consistent with Resolution 68-



16 provided that:

- the degradation is limited in extent;
- the degradation after effective source control, treatment, and control is limited to waste constituents typically encountered in municipal wastewater as specified in the groundwater limitations in this Order;
- the Discharger minimizes the degradation by fully implementing, regularly maintaining, and optimally operating best practicable treatment and control (BPTC) measures; and
- the degradation does not result in water quality less than that prescribed in the Basin Plan.

**Table F-9. Summary of Final Effluent Limitations**

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
BOD 5-day @ 20°C	mg/L	20	40	50	---	---
	lbs/day <sup>[1]</sup>	350	700	875	---	---
Total Suspended Solids	mg/L	30	40	50	---	---
	lbs/day <sup>[1]</sup>	525	700	875	---	---
pH	standard units	---	---	---	6.5	8.5
Copper	µg/L	50	---	70	---	---
Nitrate (as N)	mg/L	73	---	126	---	---
Settleable Solids	mL/L	0.1	---	0.2	---	---
Ammonia	mg/L	10	---	30	---	---
	lbs/day <sup>[1]</sup>	177	---	525	---	---

[1] Calculated with the following formula: 8.345 x concentration x flow, using a design flow of 2.1 mgd.

- a. **Percent Removal:** The average monthly percent removal of BOD 5-day 20°C and total suspended solids shall not be less than 85 percent.
- b. **Acute Whole Effluent Toxicity.** Survival of aquatic organisms in 96-hour bioassays of undiluted waste shall be no less than:
  - i. 70%, minimum for any one bioassay; and
  - ii. 90%, median for any three consecutive bioassays.
- c. **Temperature.** The maximum temperature of the discharge shall not exceed the natural receiving water temperature by more than 20°F.

- d. **Total Coliform Organisms.** Effluent total coliform organisms shall not exceed:
- i. 23 most probable number (MPN) per 100 mL, as a 7-day median; and
  - ii. 240 MPN/100 mL, more than once in any 30-day period.
- e. **Average Daily Discharge Flow.** The Average Daily Discharge Flow shall not exceed 2.1 mgd.
- f. **Electrical Conductivity.** Effluent electrical conductivity shall not exceed 1000  $\mu$ mhos/cm, as a monthly average of mean daily values, if: (1) the Discharger fails to submit a Salinity Plan to reduce its salinity impacts to the Delta, including a schedule, to comply with conditions (1) – (3) below to the Regional Water Board within six months of the effective date of this permit, or (2) the Discharger fails to timely implement the Salinity Plan upon the Regional Water Board's approval. The proposed Salinity Plan will be circulated for no less than 30 days of public comment prior to the Regional Water Board's consideration of the Salinity Plan, and the Regional Water Board may revise the Salinity Plan prior to approving it.
- 1) The Discharger implements all reasonable steps to obtain alternative, lower salinity water supply sources; and
  - 2) The Discharger develops and implements a salinity source control program that will identify and implement measures to reduce salinity in discharges from residential, commercial, industrial and infiltration sources in an effort to meet the interim salinity goal of a maximum 500  $\mu$ mhos/cm electrical conductivity increase over the weighted average electrical conductivity of the Discovery Bay's water supply; and
  - 3) The Discharger participates financially in the development of the Central Valley Salinity Management Plan at a level commensurate with its contributions of salinity to the Delta.
- Upon determination by the Regional Water Board that the Discharger has materially failed to comply with the approved Salinity Plan due to circumstances within its control, the final effluent limitations for electrical conductivity shall become effective immediately.
- Until such time, the effluent electrical conductivity concentration shall not exceed 2100  $\mu$ mhos/cm as an annual average.
- g. **Total Recoverable Iron.** Effluent total recoverable iron shall not exceed 300  $\mu$ g/L, as an annual average.

- h. **Aluminum.** Effluent total recoverable aluminum concentrations shall not exceed 200 µg/L, as an annual average.

**E. Interim Effluent Limitations**

Not applicable.

**F. Land Discharge Specifications**

Not Applicable.

**G. Reclamation Specifications**

Not Applicable.

**V. RATIONALE FOR RECEIVING WATER LIMITATIONS**

Basin Plan water quality objectives to protect the beneficial uses of surface water and groundwater include numeric objectives and narrative objectives, including objectives for chemical constituents, toxicity, and tastes and odors. The toxicity objective requires that surface water and groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in humans, plants, animals, or aquatic life. The chemical constituent objective requires that surface water and groundwater shall not contain chemical constituents in concentrations that adversely affect any beneficial use or that exceed the maximum contaminant levels (MCLs) in Title 22, CCR. The tastes and odors objective states that surface water and groundwater shall not contain taste- or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses. The Basin Plan requires the application of the most stringent objective necessary to ensure that surface water and groundwater do not contain chemical constituents, toxic substances, radionuclides, or taste and odor producing substances in concentrations that adversely affect domestic drinking water supply, agricultural supply, or any other beneficial use.

**A. Surface Water**

CWA section 303(a-c), requires states to adopt water quality standards, including criteria where they are necessary to protect beneficial uses. The Regional Water Board adopted water quality criteria as water quality objectives in the Basin Plan. The Basin Plan states that “[t]he numerical and narrative water quality objectives define the least stringent standards that the Regional Board will apply to regional waters in order to protect the beneficial uses.” The Basin Plan includes numeric and narrative water quality objectives for various beneficial uses and water bodies. This Order contains Receiving Surface Water Limitations based on the Basin Plan numerical and narrative water quality objectives for biostimulatory substances, chemical constituents, color, dissolved oxygen, floating material, oil and grease, pH, pesticides, radioactivity, salinity,

sediment, settleable material, suspended material, tastes and odors, temperature, toxicity, and turbidity.

Numeric Basin Plan objectives for bacteria, dissolved oxygen, pH, temperature, and turbidity are applicable to this discharge and have been incorporated as Receiving Surface Water Limitations. Rational for these numeric receiving surface water limitations are as follows:

1. **Bacteria.** The Basin Plan includes a water quality objective that “[I]n water designated for contact recreation (REC-1), the fecal coliform concentration based on a minimum of not less than five samples for any 30-day period shall not exceed a geometric mean of 200/100 mL, nor shall more than ten percent of the total number of samples taken during any 30-day period exceed 400/100 mL.” Numeric Receiving Water Limitations for bacteria are included in this Order and are based on the Basin Plan objective.
2. **Biostimulatory Substances.** The Basin Plan includes a water quality objective that “[W]ater shall not contain biostimulatory substances which promote aquatic growths in concentrations that cause nuisance or adversely affect beneficial uses.” Receiving Water Limitations for biostimulatory substances are included in this Order and are based on the Basin Plan objective.
3. **Color.** The Basin Plan includes a water quality objective that “[W]ater shall be free of discoloration that causes nuisance or adversely affects beneficial uses.” Receiving Water Limitations for color are included in this Order and are based on the Basin Plan objective.
4. **Chemical Constituents.** The Basin Plan includes a water quality objective that “[W]aters shall not contain chemical constituents in concentrations that adversely affect beneficial uses.” Receiving Water Limitations for chemical constituents are included in this Order and are based on the Basin Plan objective.
5. **Dissolved Oxygen.** Old River has been designated as having the beneficial use of cold freshwater aquatic habitat (COLD). For water bodies designated as having COLD as a beneficial use, the Basin Plan includes a water quality objective of maintaining a minimum of 7.0 mg/L of dissolved oxygen. Since the beneficial use of COLD does apply to Old River, a receiving water limitation of 7.0 mg/L for dissolved oxygen was included in this Order.
6. **Floating Material.** The Basin Plan includes a water quality objective that “[W]ater shall not contain floating material in amounts that cause nuisance or adversely affect beneficial uses.” Receiving Water Limitations for floating material are included in this Order and are based on the Basin Plan objective.
7. **Oil and Grease.** The Basin Plan includes a water quality objective that “[W]aters shall not contain oils, greases, waxes, or other materials in concentrations that cause nuisance, result in a visible film or coating on the surface of the water or on objects in the water, or otherwise adversely affect beneficial uses.” Receiving Water

Limitations for oil and grease are included in this Order and are based on the Basin Plan objective.

8. **pH.** The Basin Plan includes water quality objective that “[T]he 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.” This Order includes receiving water limitations for both pH range and pH change.

The Basin Plan allows an appropriate averaging period for pH change in the receiving stream. Since there is no technical information available that indicates that aquatic organisms are adversely affected by shifts in pH within the 6.5 to 8.5 range, an averaging period is considered appropriate and a monthly averaging period for determining compliance with the 0.5 receiving water pH limitation is included in this Order.

9. **Pesticides.** The Basin Plan includes a water quality objective for pesticides beginning on page III-6.00. Receiving Water Limitations for pesticides are included in this Order and are based on the Basin Plan objective.

10. **Radioactivity.** The Basin Plan includes a water quality objective that “[R]adionuclides shall not be present in concentrations that are harmful to human, plant, animal or aquatic life nor that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal or aquatic life.” The Basin Plan states further that “[A]t a minimum, waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of radionuclides in excess of the maximum contaminant levels (MCLs) specified in Table 4 (MCL Radioactivity) of Section 64443 of Title 22 of the California Code of Regulations...” Receiving Water Limitations for radioactivity are included in this Order and are based on the Basin Plan objective.

11. **Sediment.** The Basin Plan includes a water quality objective that “[T]he suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.” Receiving Water Limitations for suspended sediments are included in this Order and are based on the Basin Plan objective.

12. **Settleable Material.** The Basin Plan includes a water quality objective that “[W]aters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses.” Receiving Water Limitations for settleable material are included in this Order and are based on the Basin Plan objective.

13. **Suspended Material.** The Basin Plan includes a water quality objective that “[W]aters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.” Receiving Water Limitations for suspended material are included in this Order and are based on the Basin Plan objective.

**14. Taste and Odors.** The Basin Plan includes a water quality objective that “[W]ater 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.” Receiving Water Limitations for taste- or odor-producing substances are included in this Order and are based on the Basin Plan objective.

**15. Temperature.** The Thermal Plan is applicable to this discharge. The Thermal Plan requires that the discharge shall not cause the following in Old River:

- The creation of a zone, defined by water temperatures of more than 1°F above natural receiving water temperature, which exceeds 25 percent of the cross-sectional area of the river channel at any point.
- A surface water temperature rise greater than 4°F above the natural temperature of the receiving water at any time or place.

Receiving Water Limitations for temperature are included in this Order and are based on the Thermal Plan requirements.

**16. Toxicity.** The Basin Plan includes a water quality objective that “[A]ll waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.” Receiving Water Limitations for toxicity are included in this Order and are based on the Basin Plan objective.

**17. Turbidity.** The Basin Plan includes a water quality objective that “[I]ncreases in turbidity attributable to controllable water quality factors shall not exceed the following limits:

- Where natural turbidity is between 0 and 5 Nephelometric Turbidity Units (NTUs), increases shall not exceed 1 NTU.
- Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent.
- Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs.
- Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent.
- For Delta waters, turbidity shall not exceed 50 NTUs in waters of the central Delta, and 150 NTUs in other Delta waters. “

A numeric Receiving Surface Water Limitation for turbidity is included in this Order and is based on the Basin Plan objective for turbidity.

### **B. Groundwater**

The beneficial uses of the underlying ground water are municipal and domestic supply, industrial service supply, industrial process supply, and agricultural supply. Basin Plan water quality objectives include narrative objectives for chemical constituents, tastes and odors, and toxicity of groundwater. The toxicity objective requires that groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in humans, plants, animals, or aquatic life. The chemical constituent objective states groundwater shall not contain chemical constituents in concentrations that adversely affect any beneficial use. The tastes and odors objective prohibits taste- or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses. The Basin Plan also establishes numerical water quality objectives for chemical constituents and radioactivity in groundwaters designated as municipal supply. These include, at a minimum, compliance with MCLs in Title 22 of the CCR. The bacteria objective prohibits coliform organisms at or above 2.2 MPN/100 mL. The Basin Plan requires the application of the most stringent objective necessary to ensure that waters do not contain chemical constituents, toxic substances, radionuclides, taste- or odor-producing substances, or bacteria in concentrations that adversely affect municipal or domestic supply, agricultural supply, industrial supply or some other beneficial use. Groundwater limitations are required to protect the beneficial uses of the underlying groundwater.

## **VI. RATIONALE FOR MONITORING AND REPORTING REQUIREMENTS**

Section 122.48 requires that all NPDES permits specify requirements for recording and reporting monitoring results. Water Code sections 13267 and 13383 authorize the Regional Water Board to require technical and monitoring reports. The Monitoring and Reporting Program (MRP), Attachment E of this Order, establishes monitoring and reporting requirements to implement federal and state requirements. The following provides the rationale for the monitoring and reporting requirements contained in the MRP for this facility.

### **A. Influent Monitoring**

Influent monitoring is required to collect data on the characteristics of the wastewater and to assess compliance with effluent limitations (e.g., BOD and TSS reduction requirements). All influent monitoring requirements have been retained from the previous Order.

### **B. Effluent Monitoring**

Pursuant to the requirements of 40 CFR §122.44(i)(2) effluent monitoring is required for all constituents with effluent limitations. Effluent monitoring is necessary to assess

compliance with effluent limitations, assess the effectiveness of the treatment process, and to assess the impacts of the discharge on the receiving stream.

Most effluent monitoring requirements are retained from the previous Order. Changes in effluent monitoring requirements include an increase in monitoring frequency from quarterly to monthly for iron, and monthly monitoring requirements for manganese are established by this Order because reasonable potential was found for these constituents. A biannual monitoring requirement for dioxin-TEQ is established by this Order because dioxin congeners were detected in the effluent during the term of the previous permit, and further characterization of the effluent with regards to dioxins is justified.

### **C. Whole Effluent Toxicity Testing Requirements**

- 1. Acute Toxicity.** Monthly 96-hour bioassay testing is required to demonstrate compliance with the effluent limitation for acute toxicity.
- 2. Chronic Toxicity.** Quarterly chronic whole effluent toxicity testing is required in order to demonstrate compliance with the Basin Plan's narrative toxicity objective.

### **D. Receiving Water Monitoring**

- 1. Surface Water.** Receiving water monitoring is necessary to assess compliance with receiving water limitations and to assess the impacts of the discharge on the receiving stream.

### **E. Ultraviolet Disinfection System Monitoring**

UV System specifications and monitoring and reporting is required when the UV system becomes operational to ensure that adequate UV dosage is applied to the wastewater to inactivate pathogens e.g. viruses in the wastewater. UV Disinfection system monitoring are imposed pursuant to requirements established by the California Department of Public Health, (DPH) and the National Water Research Institute (NWRI) and American Water Works Association Research Foundation NWRI/AWWARF's "*Ultraviolet Disinfection Guidelines for Drinking Water and Water Reuse*."

### **F. Other Monitoring Requirements**

#### **1. Biosolids Monitoring**

Biosolids monitoring is required to ensure compliance with the biosolids disposal requirements (Special Provisions VI.C.6.a.). Biosolids disposal requirements are imposed pursuant to 40 CFR Part 503 to protect public health and prevent groundwater degradation. Biosolids monitoring requirements are retained from the previous permit.



## 2. Water Supply Monitoring

Water supply monitoring is required to evaluate the source of salinity constituents in the wastewater effluent. Water supply monitoring requirements are also retained from the previous permit.

## 3. Groundwater

- a. Section 13267 of the California Water Code states, in part, "(a) A Regional Water Board, in establishing...waste discharge requirements... may investigate the quality of any waters of the state within its region" and "(b) (1) In conducting an investigation..., the Regional Water Board may require that any person who... discharges... waste...that could affect the quality of waters within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the Regional Water Board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports." In requiring those reports, the Regional Water Board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports. The Monitoring and Reporting Program (Attachment E) is issued pursuant to California Water Code Section 13267. The groundwater monitoring and reporting program required by this Order and the Monitoring and Reporting Program are necessary to assure compliance with these waste discharge requirements. The Discharger is responsible for the discharges of waste at the facility subject to this Order.
- b. Monitoring of the groundwater must be conducted to determine if the discharge has caused an increase in constituent concentrations, when compared to background. The monitoring must, at a minimum, require a complete assessment of groundwater impacts including the vertical and lateral extent of degradation, an assessment of all wastewater-related constituents which may have migrated to groundwater, an analysis of whether additional or different methods of treatment or control of the discharge are necessary to provide best practicable treatment or control to comply with Resolution No. 68-16. Economic analysis is only one of many factors considered in determining best practicable treatment or control. If monitoring indicates that the discharge has incrementally increased constituent concentrations in groundwater above background, this permit may be reopened and modified. Until groundwater monitoring is sufficient, this Order contains Groundwater Limitations that allow groundwater quality to be degraded for certain constituents when compared to background groundwater quality, but not to exceed water quality objectives. If groundwater quality has been degraded by the discharge, the incremental change in pollutant concentration (when compared with background) may not be increased. If groundwater quality has been or may be degraded by the discharge, this Order may be reopened and specific numeric limitations established consistent with Resolution 68-16 and the Basin Plan.

- c. Effluent from POTWs may contain constituents that degrade groundwater and surface water, provided the discharge is in compliance with Resolution 68-16. This Order requires the Discharger to continue groundwater monitoring up gradient and down gradient of the operational disposal ponds. Monitoring requirements for elevation, depth to groundwater, electrical conductivity, nitrates (as N), and total coliform organisms are carried over from Order No. R5-2003-0067.
- d. The groundwater monitoring reports are necessary to evaluate impacts to waters of the State to assure protection of beneficial uses and compliance with Regional Board plans and policies, including Resolution 68-16. Evidence in the record includes effluent monitoring data that indicates the presence of constituents that may degrade groundwater and surface water.

## VII. RATIONALE FOR PROVISIONS

### A. Standard Provisions

Standard Provisions, which apply to all NPDES permits in accordance with section 122.41, and additional conditions applicable to specified categories of permits in accordance with section 122.42, are provided in Attachment D. The discharger must comply with all standard provisions and with those additional conditions that are applicable under section 122.42.

Section 122.41(a)(1) and (b) through (n) establish conditions that apply to all State-issued NPDES permits. These conditions must be incorporated into the permits either expressly or by reference. If incorporated by reference, a specific citation to the regulations must be included in the Order. Section 123.25(a)(12) allows the state to omit or modify conditions to impose more stringent requirements. In accordance with section 123.25, this Order omits federal conditions that address enforcement authority specified in sections 122.41(j)(5) and (k)(2) because the enforcement authority under the Water Code is more stringent. In lieu of these conditions, this Order incorporates by reference Water Code section 13387(e).

### B. Special Provisions

#### 1. Reopener Provisions

- a. **Mercury (VI.C.1.c.)** This provision allows the Regional Water Board to reopen this Order in the event mercury is found to be causing toxicity based on acute or chronic toxicity test results, or if a TMDL program is adopted. In addition, this Order may be reopened if the Regional Water Board determines that a mercury offset program is feasible for dischargers subject to NPDES permits.
- b. **Salinity Minimization Plan (VI.C.1.d.)** This Order requires the Discharger prepare a salinity minimization plan. This reopener provision allows the Regional Water Board to reopen this Order for addition and/or modification of effluent

limitations and requirements for EC based on a review of the salinity minimization plan.

- c. **Whole Effluent Toxicity (VI.C.1.e.)** This Order requires the Discharger to investigate the causes of, and identify corrective actions to reduce or eliminate effluent toxicity through a Toxicity Reduction Evaluation (TRE). This Order may be reopened to include a numeric chronic toxicity limitation, a new acute toxicity limitation, and/or a limitation for a specific toxicant identified in the TRE. Additionally, if a numeric chronic toxicity water quality objective is adopted by the State Water Board, this Order may be reopened to include a numeric chronic toxicity limitation based on that objective.
- d. **Water Effects Ratio (WER) and Metal Translators (VI.C.1.f.)** A default WER of 1.0 has been used in this Order for calculating CTR criteria for applicable priority pollutant inorganic constituents. In addition, default dissolved-to-total metal translators have been used to convert water quality objectives from dissolved to total recoverable when developing effluent limitations for inorganic constituents. If the Discharger performs studies to determine site-specific WERs and/or site-specific dissolved-to-total metal translators, this Order may be reopened to modify the effluent limitations for the applicable inorganic constituents.

## 2. Special Studies and Additional Monitoring Requirements

- a. **Chronic Whole Effluent Toxicity Requirements.** The Basin Plan contains a narrative toxicity objective that 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.) Based on quarterly whole effluent chronic toxicity testing performed by the Discharger from January 2004 through July 2007, the discharge does not have reasonable potential to cause or contribute to an in-stream excursion above of the Basin Plan's narrative toxicity objective when effluent dilution into Old River is considered.

This provision requires the Discharger to develop a Toxicity Reduction Evaluation (TRE) Work Plan in accordance with EPA guidance. In addition, the provision provides a numeric toxicity monitoring trigger and requirements for accelerated monitoring, as well as, requirements for TRE initiation if a pattern of toxicity has been demonstrated.

- i. **Monitoring Trigger.** A numeric toxicity monitoring trigger of  $\geq 10$  TUc (where TUc = 100/NOEC) is applied in the provision. This Order grants a dilution credit of 23:1. Applying a study trigger of 10 TUc provides a large safety factor to assure that chronic toxicity does not occur in Old River.
- ii. **Accelerated Monitoring.** The provision requires accelerated WET testing when a regular WET test result exceeds the monitoring trigger. The purpose of accelerated monitoring is to determine, in an expedient manner, whether there is a pattern of toxicity before requiring the implementation of a TRE.

Due to possible seasonality of the toxicity, the accelerated monitoring should be performed in a timely manner, preferably taking no more than 2 to 3 months to complete.

The provision requires accelerated monitoring consisting of four chronic toxicity tests every two weeks using the species that exhibited toxicity. Guidance regarding accelerated monitoring and TRE initiation is provided in the *Technical Support Document for Water Quality-based Toxics Control, EPA/505/2-90-001, March 1991* (TSD). The TSD at page 118 states, "EPA recommends if toxicity is repeatedly or periodically present at levels above effluent limits more than 20 percent of the time, a TRE should be required." Therefore, four accelerated monitoring tests are required in this provision. If no toxicity is demonstrated in the four accelerated tests, then it demonstrates that toxicity is not present at levels above the monitoring trigger more than 20 percent of the time (only 1 of 5 tests are toxic, including the initial test). However, notwithstanding the accelerated monitoring results, if there is adequate evidence of a pattern of effluent toxicity (i.e. toxicity present exceeding the monitoring trigger more than 20 percent of the time), the Executive Officer may require that the Discharger initiate a TRE.

See the WET Accelerated Monitoring Flow Chart (Figure F-1), below, for further clarification of the accelerated monitoring requirements and for the decision points for determining the need for TRE initiation.

- iii. **TRE Guidance.** The Discharger is required to prepare a TRE Work Plan in accordance with USEPA guidance. Numerous guidance documents are available, as identified below:

*Toxicity Reduction Evaluation Guidance for Municipal Wastewater Treatment Plants, (EPA/833B-99/002), August 1999.*

*Generalized Methodology for Conducting Industrial TREs, (EPA/600/2-88/070), April 1989.*

*Methods for Aquatic Toxicity Identification Evaluations: Phase I Toxicity Characterization Procedures, Second Edition, EPA 600/6-91/005F, February 1991.*

*Toxicity Identification Evaluation: Characterization of Chronically Toxic Effluents, Phase I, EPA 600/6-91/005F, May 1992.*

*Methods for Aquatic Toxicity Identification Evaluations: Phase II Toxicity Identification Procedures for Samples Exhibiting acute and Chronic Toxicity, Second Edition, EPA 600/R-92/080, September 1993.*

*Methods for Aquatic Toxicity Identification Evaluations: Phase III Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity, Second Edition, EPA 600/R-92/081, September 1993.*

*Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition, EPA-821-R-02-012, October 2002.*

*Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition, EPA-821-R-02-013, October 2002.*

*Technical Support Document for Water Quality-based Toxics Control, EPA/505/2-90-001, March 1991*

**Figure F-1**  
**WET Accelerated Monitoring Flow Chart**

