

3. Test Species – Test species shall be fathead minnows (*Pimephales promelas*).
 4. Methods – The acute toxicity testing samples shall be analyzed using EPA-821-R-02-012, Fifth Edition and its subsequent amendments or revisions. Temperature, total residual chlorine, and pH shall be recorded at the time of sample collection. No pH adjustment may be made unless approved by the Executive Officer.
 5. Test Failure – If an acute toxicity test does not meet all test acceptability criteria, as specified in the test method, the Discharger must re-sample and re-test as soon as possible, not to exceed 7 days following notification of test failure.
- B. Chronic Toxicity Testing.** The Discharger shall conduct three species chronic toxicity testing to determine whether the effluent is contributing chronic toxicity to the receiving water. The Discharger shall meet the following chronic toxicity testing requirements:
1. Monitoring Frequency – The Discharger shall perform semi-annual three species chronic toxicity testing.
 2. Sample Types – Effluent samples shall be flow proportional 24-hour composites and shall be representative of the volume and quality of the discharge. The effluent samples shall be taken at Monitoring Location EFF-001. The receiving water control shall be a grab sample obtained from the RSW-001 sampling location, as identified in the Monitoring and Reporting Program.
 3. Sample Volumes – Adequate sample volumes shall be collected to provide renewal water to complete the test in the event that the discharge is intermittent.
 4. Test Species – Chronic toxicity testing measures sublethal (e.g. reduced growth, reproduction) and/or lethal effects to test organisms exposed to an effluent compared to that of the control organisms. The Discharger shall conduct chronic toxicity tests with:
 - The cladoceran, water flea, *Ceriodaphnia dubia* (survival and reproduction test);
 - The fathead minnow, *Pimephales promelas* (larval survival and growth test); and
 - The green alga, *Selenastrum capricornutum* (growth test).
 5. Methods – The presence of chronic toxicity shall be estimated as specified in *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* and its subsequent amendments or revisions.
 6. Reference Toxicant – As required by the SIP, all chronic toxicity tests shall be conducted with concurrent testing with a reference toxicant and shall be reported with the chronic toxicity test results.

7. **Dilutions** – The chronic toxicity testing shall be performed using the dilution series identified in Table E-4, below. The receiving water control shall be used as the diluent (unless the receiving water is toxic or is dry upstream of the discharge). In such cases, laboratory control water may be used as the diluent.
8. **Test Failure** –The Discharger must re-sample and re-test as soon as possible, but no later than fourteen (14) days after receiving notification of a test failure. A test failure is defined as follows:
 - a. The reference toxicant test or the effluent test does not meet all test acceptability criteria as specified in the *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 (Method Manual), and its subsequent amendments or revisions; or
 - b. The percent minimum significant difference (PMSD) measured for the test exceeds the upper PMSD bound variability criterion in Table 6 on page 52 of the Method Manual. (A retest is only required in this case if the test results do not exceed the monitoring trigger specified in Special Provisions VI. 2.a.iii.)

Table E-4. Chronic Toxicity Testing Dilution Series

Sample	Dilutions (%)					Controls	
	100	75	50	25	12.5	Receiving Water	Laboratory Water
% Effluent	100	75	50	25	12.5	0	0
% Receiving Water ¹	0	25	50	75	87.5	100	0
% Laboratory Water	0	0	0	0	0	0	100

¹ If receiving water is toxic or if Magnolia Creek is dry upstream of the discharge, laboratory water will be used for the dilution series as described in EPA method 821-R-02-013 Section 7.12.

- C. **WET Testing Notification Requirements.** The Discharger shall notify the Regional Water Board within 24-hrs after the receipt of test results exceeding the monitoring trigger during regular or accelerated monitoring, or an exceedance of the acute toxicity effluent limitation.
- D. **WET Testing Reporting Requirements.** All toxicity test reports shall include the contracting laboratory's complete report provided to the Discharger and shall be in accordance with the appropriate "Report Preparation and Test Review" sections of the method manuals. At a minimum, whole effluent toxicity monitoring shall be reported as follows:
 1. **Chronic WET Reporting.** Regular chronic toxicity monitoring results shall be reported to the Regional Water Board on the schedule for semi-annual sampling described in Table E-12, and shall contain, at minimum:
 - a. The results expressed in TUC, measured as 100/NOEC, and also measured as 100/LC₅₀, 100/EC₂₅, 100/IC₂₅, and 100/IC₅₀, as appropriate.

- b. The statistical methods used to calculate endpoints;
- c. The statistical output page, which includes the calculation of the percent minimum significant difference (PMSD);
- d. The dates of sample collection and initiation of each toxicity test; and
- e. The results compared to the numeric toxicity monitoring trigger.

Additionally, the monthly discharger self-monitoring reports shall contain an updated chronology of chronic toxicity test results expressed in TUc, and organized by test species, type of test (survival, growth or reproduction), and monitoring frequency, i.e., either quarterly, monthly, accelerated, or TRE.

2. **Acute WET Reporting.** Acute toxicity test results shall be submitted with the monthly discharger self-monitoring reports and reported as percent survival.
3. **TRE Reporting.** Reports for Toxicity Reduction Evaluations shall be submitted in accordance with the schedule contained in the Discharger's approved TRE Work Plan.
4. **Quality Assurance (QA).** The Discharger must provide the following information for QA purposes (If applicable):
 - a. Results of the applicable reference toxicant data with the statistical output page giving the species, NOEC, LOEC, type of toxicant, dilution water used, concentrations used, PMSD, and dates tested.
 - b. The reference toxicant control charts for each endpoint, which include summaries of reference toxicant tests performed by the contracting laboratory.
 - c. Any information on deviations or problems encountered and how they were dealt with.

VI. DISCHARGE TO EMERGENCY STORAGE POND REQUIREMENTS

A. Monitoring Location ESP-001

1. The Discharger shall monitor plant effluent discharged to the Emergency Storage Pond as follows:

Table E-5. Emergency Storage Pond Requirements

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Flow	MGD	Meter	1/day ¹	--
Freeboard	Feet	Visual	1/day	--
Odors	--	Observation	1/day	--

¹ Report total flow for each day when wastewater is discharged to the emergency storage pond.

VII. LAND DISCHARGE MONITORING REQUIREMENTS – Not Applicable

VIII. RECLAMATION MONITORING REQUIREMENTS

A. Monitoring Location PND-001, PND-002, and PND-003

1. The Discharger shall monitor the discharge to the onsite ponds as follows:

Table E-6. Reclamation Pond Monitoring Requirements

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Flow	MGD	Meter	1/day ¹	²
Freeboard	feet	Measured	1/month	²
Biochemical Oxygen Demand (5-day @ 20°C)	mg/L	Composite	2/week	²
Total Suspended Solids	mg/L	Composite	2/week	²
Total Coliform Organisms	MPN/100 mL	Grab	3/week	²
pH	standard units	Grab	3/week	²

¹ Report total flow for each day when wastewater is discharged to the reclamation ponds.
² Pollutants shall be analyzed using the analytical methods described in 40 CFR Part 136.

B. Monitoring Location LND-001

1. The Discharger shall monitor the discharge to on site landscape irrigation as follows:

Table E-7. Landscape Irrigation Monitoring Requirements

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Flow	MGD	Meter	1/day ¹	--
Landscape Irrigation Areas	inches/acre/month	Calculate	1/month	--

¹ Report total flow for each day when reclaimed water is used for landscape irrigation.

IX. RECEIVING WATER MONITORING REQUIREMENTS – SURFACE WATER

A. Monitoring Location RSW-001 and RSW-002

1. The Discharger shall monitor Magnolia Creek at RSW-001 and RSW-002 as follows:

Table E-8. Receiving Water Monitoring Requirements

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Dissolved Oxygen	mg/L	Grab	1/week	¹
pH	Standard Units	Grab	1/week	¹
Temperature	°F (°C)	Grab	1/week	¹

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Electrical Conductivity @ 25°C	µmhos/cm	Grab	1/week	1
Turbidity	NTU	Meter	1/week	1
Radionuclides	pCi/L	Grab	1/year	1
Floating or suspended matter	Narrative	Visual	1/week	--
Discoloration	Narrative	Visual	1/week	--
Bottom Deposits	Narrative	Visual	1/week	--
Aquatic Life	Narrative	Visual	1/week	--
Visible films, sheens	Narrative	Visual	1/week	--
Fungi, slimes, or objectionable growths	Narrative	Visual	1/week	--
Potential nuisance conditions	Narrative	Visual	1/week	--
Foam	Narrative	Visual	1/week	--

As per 40 CFR Part 136

B. Ground Water Monitoring – Not Applicable

X. OTHER MONITORING REQUIREMENTS

A. Biosolids

1. Monitoring Location BIO-001

1. A composite sample of sludge shall be collected annually at Monitoring Location BIO-001 in accordance with EPA's *POTW Sludge Sampling and Analysis Guidance Document*, August 1989, and tested for metals listed in 40 CFR section 122 Appendix D, Table III (excluding total phenols).
2. Sampling records shall be retained for a minimum of **5 years**. A log shall be kept of sludge quantities generated and of handling and disposal activities. The frequency of entries is discretionary; however, the log should be complete enough to serve as a basis for part of the annual report.
3. Upon removal of sludge, the Discharger shall submit characterization of sludge quality, including sludge percent solids and the most recent quantitative results of chemical analysis for the metals listed in 40 CFR 122 Appendix D, Table III (excluding total phenols). In addition to USEPA's *POTW Sludge Sampling and Analysis Guidance Document*, August 1989, suggested methods for analysis of sludge are provided in USEPA publications titled "*Test Methods for Evaluating Solid Waste: Physical/Chemical Methods*" and "*Test Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater*". Recommended analytical holding times for sludge samples should reflect those specified in 40 CFR 136.6.3(e).

B. Municipal Water Supply

1. Monitoring Location SPL-001

The Discharger shall monitor the Municipal Water Supply at SPL-001. A sampling station shall be established where a representative sample of the municipal water supply can be obtained.

Table E-10. Municipal Water Supply Monitoring Requirements

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Total Dissolved Solids	mg/L	Grab	1/year	
Electrical Conductivity @ 25°C ¹	µmhos/cm	Grab	1/year	
Standard Minerals ²	mg/L	Grab	1/year	²

¹ If the water supply is from more than one source, the EC shall be reported as a weighted average and include copies of supporting calculations.

² Standard minerals shall include all major cations and anions and include verification that the analysis is complete (i.e., cation/anion balance).

C. Ultraviolet Disinfection System

1. Monitoring Location UVS-001

The Discharger shall monitor UVS-001 as follows:

Table E-11. Ultraviolet Disinfection System Monitoring Requirements

Parameter	Units	Sample Type	Minimum Sampling Frequency
Flow rate	MGD	Meter	Continuous
Turbidity ¹	NTU	Meter	Continuous
Number of UV banks in operation	Number	Meter	Continuous
UV Transmittance	Percent (%)	Meter	Continuous
UV Power Setting	Percent (%)	Meter	Continuous
UV Dose ²	MW-sec/cm ²	Calculated	Continuous

¹ Report daily average turbidity and maximum. If the influent exceeds 10 NTU, collect a sample for total coliform and report the duration of the turbidity exceedance.

² Report daily minimum UV dose, daily average UV dose, and weekly average UV dose. For the daily minimum UV dose, also report associated number of banks, gallons per minute per lamp, power settings, and UV transmittance used in the calculation. If effluent discharge has received less than the minimum UV dose and is not diverted from discharging to Magnolia Creek, report the duration and dose calculation variables associated with each incident.

XI. REPORTING REQUIREMENTS

A. General Monitoring and Reporting Requirements

1. The Discharger shall comply with all Standard Provisions (Attachment D) related to monitoring, reporting, and recordkeeping.
2. Upon written request of the Regional Water Board, the Discharger shall submit a summary monitoring report. The report shall contain both tabular and graphical summaries of the monitoring data obtained during the previous year(s).
3. **Compliance Time Schedules.** Not applicable.
4. The Discharger shall report to the Regional Water Board any toxic chemical release data it reports to the State Emergency Response Commission within 15 days of reporting the data to the Commission pursuant to section 313 of the "Emergency Planning and Community Right to Know Act of 1986.
5. **Reporting Protocols.** The Discharger shall report with each sample result the applicable Reporting Level (RL) and the current Method Detection Limit (MDL), as determined by the procedure in 40 CFR Part 136. For priority pollutants, RLs and MDLs not need to be reported on USEPA form 3320-1.

The Discharger shall report the results of analytical determinations for the presence of chemical constituents in a sample using the following reporting protocols:

- a. Sample results greater than or equal to the RL shall be reported as measured by the laboratory (i.e., the measured chemical concentration in the sample).
- b. Sample results less than the RL, but greater than or equal to the laboratory's MDL, shall be reported as "Detected, but Not Quantified," or DNQ. The estimated chemical concentration of the sample shall also be reported.

For the purposes of data collection, the laboratory shall write the estimated chemical concentration next to DNQ as well as the words "Estimated Concentration" (may be shortened to "Est. Conc."). The laboratory may, if such information is available, include numerical estimates of the data quality for the reported result. Numerical estimates of data quality may be percent accuracy (± a percentage of the reported value), numerical ranges (low to high), or any other means considered appropriate by the laboratory.

- c. Sample results less than the laboratory's MDL shall be reported as "Not Detected," or ND.
- d. Dischargers are to instruct laboratories to establish calibration standards so that the ML value (or its equivalent if there is differential treatment of samples relative to calibration standards) is the lowest calibration standard. At no time is the Discharger to use analytical data derived from *extrapolation* beyond the lowest point of the calibration curve.

6. **Multiple Sample Data.** When determining compliance with an AMEL, AWEL, or MDEL for priority pollutants and more than one sample result is available, the Discharger shall compute the arithmetic mean unless the data set contains one or more reported determinations of "Detected, but Not Quantified" (DNQ) or "Not Detected" (ND). In those cases, the Discharger shall compute the median in place of the arithmetic mean in accordance with the following procedure:
 - a. The data set shall be ranked from low to high, ranking the reported ND determinations lowest, DNQ determinations next, followed by quantified values (if any). The order of the individual ND or DNQ determinations is unimportant.
 - b. The median value of the data set shall be determined. If the data set has an odd number of data points, then the median is the middle value. If the data set has an even number of data points, then the median is the average of the two values around the middle unless one or both of the points are ND or DNQ, in which case the median value shall be the lower of the two data points where DNQ is lower than a value and ND is lower than DNQ.

B. Self Monitoring Reports (SMRs)

1. At any time during the term of this permit, the State or Regional Water Board may notify the Discharger to electronically submit Self-Monitoring Reports (SMRs) using the State Water Board's California Integrated Water Quality System (CIWQS) Program Web site (<http://www.waterboards.ca.gov/ciwqs/index.html>). Until such notification is given, the Discharger shall submit hard copy SMRs. The CIWQS Web site will provide additional directions for SMR submittal in the event there will be service interruption for electronic submittal.
2. Monitoring results shall be submitted to the Regional Water Board as specified in Table E-12.
3. In reporting the monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized in such a manner to illustrate clearly whether the discharge complies with waste discharge requirements. The highest daily maximum for the month, monthly and weekly averages, and medians, and removal efficiencies (%) for BOD and Total Suspended Solids, shall be determined and recorded as needed to demonstrate compliance.
4. With the exception of flow, all constituents monitored on a continuous basis (metered), shall be reported as daily maximums, daily minimums, and daily averages; flow shall be reported as the total volume discharged per day for each day of discharge.
5. If the Discharger monitors any pollutant at the locations designated herein more frequently than is required by this Order, the results of such monitoring shall be included in the calculation and reporting of the values required in the discharge

monitoring report form. Such increased frequency shall be indicated on the discharge monitoring report form.

6. A letter transmitting the self-monitoring reports shall accompany each report. Such a letter shall include a discussion of requirement violations found during the reporting period, and actions taken or planned for correcting noted violations, such as operation or facility modifications. If the Discharger has previously submitted a report describing corrective actions and/or a time schedule for implementing the corrective actions, reference to the previous correspondence will be satisfactory. The transmittal letter shall contain the penalty of perjury statement by the Discharger, or the Discharger's authorized agent, as described in the Standard Provisions.
7. SMRs must be submitted to the Regional Water Board, signed and certified as required by the Standard Provisions (Attachment D), to the address listed below:

Regional Water Quality Control Board
Central Valley Region
11020 Sun Center Dr., Suite #200
Rancho Cordova, CA 95670-6114

8. Monitoring periods and reporting for all required monitoring shall be completed according to the following schedule:

Table E-12. Monitoring Periods and Reporting Schedule

Sampling Frequency	Monitoring Period Begins On...	Monitoring Period	SMR Due Date
Continuous	Permit effective date	All	First day of second calendar month following month of sampling
1/day	Permit effective date	(Midnight through 11:59 PM) or any 24-hour period that reasonably represents a calendar day for purposes of sampling.	First day of second calendar month following month of sampling
1/week	Sunday following permit effective date or on permit effective date if on a Sunday	Sunday through Saturday	First day of second calendar month following month of sampling
2/week	Sunday following permit effective date or on permit effective date if on a Sunday	Sunday through Saturday	First day of second calendar month following month of sampling
3/week	Sunday following permit effective date or on permit effective date if on a Sunday	Sunday through Saturday	First day of second calendar month following month of sampling
1/month	First day of calendar month following permit effective date or on permit effective date if that date is first day of the month	First day of calendar month through last day of calendar month	First day of second calendar month following month of sampling
1/quarter	Closest of 1 January, 1 April, 1 July, or 1 October following (or on) permit effective date	1 January through 31 March 1 April through 30 June 1 July through 30 September 1 October through 31 December	45 days from the end of the monitoring period
2/year	Closest of 1 January or 1 July following permit effective date	1 January through 31 December	45 days from the end of the monitoring period
1/year	1 January following (or on) permit effective date	1 January through 31 December	45 days from the end of the monitoring period

C. Discharge Monitoring Reports (DMRs)

- As described in Section X.B.1 above, at any time during the term of this permit, the State or Regional Water Board may notify the Discharger to electronically submit SMRs that will satisfy federal requirements for submittal of Discharge Monitoring Reports (DMRs). Until such notification is given, the Discharger shall submit DMRs in accordance with the requirements described below.
- DMRs must be signed and certified as required by the standard provisions (Attachment D). The Discharger shall submit the original DMR and one copy of the DMR to the address listed below:

Standard Mail	FedEx/UPS/ Other Private Carriers
State Water Resources Control Board Division of Water Quality c/o DMR Processing Center PO Box 100 Sacramento, CA 95812-1000	State Water Resources Control Board Division of Water Quality c/o DMR Processing Center 1001 I Street, 15 th Floor Sacramento, CA 95814

3. All discharge monitoring results must be reported on the official USEPA pre-printed DMR forms (EPA Form 3320-1). Forms that are self-generated cannot be accepted unless they follow the exact same format as EPA form 3320-1.

D. Other Reports

1. Within **60 days** of permit adoption, the Discharger shall submit a report outlining minimum levels, method detection limits, and analytical methods for approval, with a goal to achieve detection levels below applicable water quality criteria. At a minimum, the Discharger shall comply with the monitoring requirements for CTR constituents as outlined in Section 2.3 and 2.4 of the SIP.
2. The Discharger's sanitary sewer system collects wastewater using sewers, pipes, pumps, and/or other conveyance systems and directs the raw sewage to the wastewater treatment plant. A "sanitary sewer overflow" is defined as a discharge to ground or surface water from the sanitary sewer system at any point upstream of the wastewater treatment plant. Sanitary sewer overflows are prohibited by this Order. All violations must be reported as required in Standard Provisions. Facilities (such as wet wells, regulated impoundments, tanks, highlines, etc.) may be part of a sanitary sewer system and discharges to these facilities are not considered sanitary sewer overflows, provided that the waste is fully contained within these temporary storage facilities.
3. **Annual Operations Report.** By **1 February** of each year, the Discharger shall submit a written report to the Executive Officer containing the following:
 - a. The names, certificate grades, and general responsibilities of all persons employed at the Facility.
 - b. The names and telephone numbers of persons to contact regarding the plant for emergency and routine situations.
 - c. A statement certifying when the flow meter(s) and other monitoring instruments and devices were last calibrated, including identification of who performed the calibration.
 - d. A statement certifying whether the current operation and maintenance manual, and contingency plan, reflect the wastewater treatment plant as currently constructed and operated, and the dates when these documents were last revised and last reviewed for adequacy.

- e. The Discharger may also be requested to submit an annual report to the Regional Water Board with both tabular and graphical summaries of the monitoring data obtained during the previous year. Any such request shall be made in writing. The report shall discuss the compliance record. If violations have occurred, the report shall also discuss the corrective actions taken and planned to bring the discharge into full compliance with the waste discharge requirements.

ATTACHMENT F – FACT SHEET

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ATTACHMENT F – FACT SHEET

As described in section II of this Order, this Fact Sheet includes the legal requirements and technical rationale that serve as the basis for the requirements of this Order.

This Order has been prepared under a standardized format to accommodate a broad range of discharge requirements for Dischargers in California. Only those sections or subsections of this Order that are specifically identified as “not applicable” have been determined not to apply to this Discharger. Sections or subsections of this Order not specifically identified as “not applicable” are fully applicable to this Discharger.

I. PERMIT INFORMATION

The following table summarizes administrative information related to the facility.

Table F-1. Facility Information

WDID	5A290104003
Discharger	Nevada County Sanitation District No. 1
Name of Facility	Lake of the Pines Wastewater Treatment Plant
Facility Address	10903 Riata Way
	Auburn, CA 95602
	Nevada County
Facility Contact, Title and Phone	Wayne Robison, Plant Operator, (530) 268-1312
Authorized Person to Sign and Submit Reports	Mark Miller, Director of Sanitation, (530) 265-1351
Mailing Address	950 Maidu Avenue, Nevada City, CA 95959
Billing Address	950 Maidu Avenue, Nevada City, CA 95959
Type of Facility	Publicly Owned Treatment Works (POTW)
Major or Minor Facility	Minor
Threat to Water Quality	2
Complexity	B
Pretreatment Program	N
Reclamation Requirements	N/A
Facility Permitted Flow	0.72 million gallons per day (MGD) average dry weather flow (ADWF)
Facility Design Flow	0.72 million gallons per day (MGD) ADWF
Watershed	Bear River Hydrologic Unit, Upper Bear Hydrologic Area (HA), Lake Combie Hydrologic Sub-Area (HSA)
Receiving Water	Magnolia Creek
Receiving Water Type	Inland Surface Water

- A.** Nevada County Sanitation District No. 1 (hereinafter Discharger) is the owner and operator of Lake of the Pines Wastewater Treatment Plant (hereinafter Facility), a POTW.

For the purposes of this Order, references to the "discharger" or "permittee" in applicable federal and state laws, regulations, plans, or policy are held to be equivalent to references to the Discharger herein.

- B.** The Facility discharges wastewater to Magnolia Creek, a water of the United States, and is currently regulated by Order No. R5-2002-0095, which was adopted on 7 June 2002 and expired on 7 June 2007. The terms and conditions of the current Order have been automatically continued and remain in effect until new Waste Discharge Requirements (WDRs) and National Pollutant Discharge Elimination System (NPDES) permit are adopted pursuant to this Order.
- C.** The Discharger filed a report of waste discharge and submitted an application for renewal of its WDRs and NPDES permit on 6 December 2006. The supporting monitoring data submitted with the report of waste discharge was for the treatment facility in use at that time. The Discharger constructed a new treatment facility, which was put in operation in April 2008. Additional monitoring data was requested and a site visit was conducted on 20 May 2008 to inspect the new treatment facility. The Discharger submitted monitoring for the first 7 months of operation of the new treatment facility. This new monitoring information was used to develop permit conditions and limitations.

II. FACILITY DESCRIPTION

The Discharger provides sewerage service for the community of Lake the Pines and serves a population of approximately 1,800 residences. The Facility is located on a 105-acre parcel just west of the Lake of the Pines community (See Attachment B). The Facility design daily ADWF capacity is 0.72 MGD.

A. Description of Wastewater and Biosolids Treatment or Controls

The previous permit Order No. R5-2002-0095 regulated discharge from a secondary treatment facility with treatment in an aerated lagoon followed by three storage ponds. The disinfected secondary effluent was applied by spray irrigation to 55-acres of grassland from April through October. During the winter months, coagulation, filtration, disinfection, and dechlorination processes were added to the treatment process and the effluent was discharged to Magnolia Creek. Alum and polymer coagulants were added prior to filtration. Disinfection was accomplished using chlorine followed by dechlorination with sulfur dioxide.

The Discharger constructed a new treatment facility and all new systems were fully operational by June 2008. The majority of the old treatment facilities (aerated lagoon, flocculation basin, multimedia filters, chlorination disinfection system, chemical feed systems, storage ponds and spray irrigation fields) are no longer integral to the treatment

and disposal trains. The aeration basin can be used as emergency storage basin. The Discharger proposes to use treated effluent to keep the existing storage ponds full for wildlife habitat and onsite landscape irrigation. The new facilities are designed to treat 0.72 MGD ADWF. Tertiary treatment is required when effluent is discharged to Magnolia Creek or to the on site ponds. This Order allows for year-round discharge to Magnolia Creek. The new facilities completed in 2008 include the following (See attachment C):

1. Pump station: The two existing influent pumps were replaced with three 1,800 gallon per minute (gpm) pumps with variable speed motors. A new 8-inch magnetic flow meter was installed downstream of the rehabilitated pump station.
2. Preliminary treatment: Preliminary treatment for the new facility consists of course screens, grit removal, followed by fine screening. The course screens are used for removal of large debris that could damage downstream mechanical equipment. One course screen is provided with the ability to bypass the screen to a manually cleaned bar rack with 6 mm bar spacing. Fine screening (2mm screen opening size) prior to the Microfiltration Membrane Bioreactor (MBR) system protects the membranes from damage that could be caused by debris and non-organic matter in the waste stream. Screened solids that have been washed and compacted are collected and disposed offsite.
3. Treatment and filtration: The biological treatment system consists of a series of treatment tanks used for BOD reduction, nitrogen removal, phosphorous removal and solids separation. Solids separation is accomplished using a MBR system (0.4 microns pore size) that is immersed in the activated sludge mixed liquor. Treated effluent is pulled through the membranes by vacuum conditions created by a series of permeate pumps. The MBR system provides the required tertiary treatment with effluent turbidities less than 1 NTU. The biological treatment system is configured in two identical parallel treatment trains so that a single train can be taken off-line for maintenance during dry months of the year.
4. Disinfection: The chlorine disinfection system has been replaced by ultraviolet (UV) irradiation using low pressure, high intensity lamps equipped with an automatic sleeve cleaning system. The new disinfection system was installed in one of the channels in the existing chlorine contact tank.
5. Solid handling: Waste activated sludge (WAS) produced from the bacterial assimilation of dissolved organic material is wasted from the MBR tanks. The WAS is digested in new aerobic sludge digesters followed by centrifuge dewatering. A membrane thickener is used prior to the aerobic digestion tanks; installation of a centrifuge dewatering system. Polymer is injected into the feed sludge flow prior to the centrifuge to aid in dewatering. Dewatered solids are disposed in a landfill.
6. Yard Piping: An additional 12-inch influent force main was installed parallel to the existing force main. A new 18-inch effluent discharge pipe was installed parallel to the existing 12-inch outfall pipe to Magnolia Creek. The additional pipe allows the plant to discharge peak flows of 4 MGD.

7. **Electrical and Control:** The existing 240-volt service was replaced with 480-volt service and an 800 kW emergency standby generator with an automatic transfer switch was added. A Supervisory Control and Data Acquisition (SCADA) system was installed. The SCADA system monitors the biological treatment processes, equipment status, plant flow rates, and records effluent quality data.
8. **Site Improvements:** Several site improvements were included in the design of the new plant. These improvements included a new administration building and demolition of unneeded facilities.

B. Discharge Points and Receiving Waters

1. The Facility is located in Section 27 and 28, T14N, R8E, MDB&M, as shown in Attachment B, a part of this Order.
2. Treated municipal wastewater is discharged at Discharge Point No. 001 to Magnolia Creek, a water of the United States and a tributary to the Bear River at a point latitude 39° 02' 00" N and longitude 121° 05' 01" W.

C. Summary of Historical Requirements and Self-Monitoring Report (SMR) Data

Effluent limitations contained in Order No. R5-2002-0095 for discharges from Monitoring Location EFF-001 and representative monitoring data from the term of the previous Order are as follows:

Table F-2. Historic Effluent Limitations and Monitoring Data

Parameter	Units	Effluent Limitation			Monitoring Data (From June 2002 To August 2007)	
		Average Monthly	Average Weekly	Maximum Daily	Highest Average Monthly	Highest Daily Discharge
BOD 5-day @ 20 °C	mg/L	15	20	30	--	38
Total Suspended Solids	mg/L	15	20	40	--	82
Ammonia	mg/L	--	Floating Limit (pH-Temperature Dependent)	Floating Limit (pH Dependent)	--	25.4
Settable Solids	ml/L	0.1	--	0.2	--	0.3
Total Coliform Organisms	MPN/100 mL	2.2	--	23	--	30
Total Residual Chlorine	mg/L	--	0.01	0.02	--	0
Nitrate+Nitrite	mg/L	10	--	--	5.16	--
Nitrite	mg/L	1	--	--	25	--
Aluminum	µg/L	--	87	750	--	1,820

D. Compliance Summary

1. The Discharger had difficulty complying with the effluent limitations contained in Order No. R5-2002-0095 with the level of treatment provided by the facility processes in place at the time that Order No. R5-2002-0095 was adopted. The Regional Water Board adopted Cease and Desist Order (CDO) No. R5-2002-0096 and Time Schedule Order (TSO) No. R5-2002-0072 requiring the Discharger to develop new or modified control measures to comply with the effluent limitations for 5-day biochemical oxygen demand (BOD₅), total suspended solids (TSS), settleable solids, total coliform organisms, turbidity, ammonia, nitrate plus nitrite, and aluminum. The Discharger implemented operation of the new treatment facility in June 2008 and monitoring data for the period June 2008 to December 2008 indicates that operation of the new facility has resulted in compliance with effluent limitations in Order No. R5-2002-0095. A summary of the monitoring data from Monitoring Location EFF-001 after startup of the new facility follows:

Table F-3. Monitoring Data for New Treatment Facility

Parameter	Units	Effluent Limitation			Monitoring Data (From June 2008 To December 2008)	
		Average Monthly	Average Weekly	Maximum Daily	Highest Average Monthly	Highest Daily Discharge
BOD 5-day @ 20 °C	mg/L	15	20	30	2.03	2.2
Total Suspended Solids	mg/L	15	20	40	1.0	1.1
Ammonia	mg/L	--	Floating Limit (pH- Temperature Dependent)	Floating Limit (pH Dependent)	0.5	1.3
Settable Solids	ml/L	0.1	--	0.2	<0.05	<0.05
Total Coliform Organisms	MPN/100 mL	2.2	--	23	1	2
Total Residual Chlorine	mg/L	--	0.01	0.02	Chlorine disinfection replaced by UV disinfection.	
Nitrate+Nitrite	mg/L	10	--	--	2.31	3.54
Nitrite	mg/L	1	--	--	0.79	1.52
Aluminum	µg/L	--	87	750	17.6	25.5

E. Planned Changes

The Discharger plans to add a recycled water supply system to reduce use of potable water for plant use. The Discharger also plans on removal of accumulated sludge from the

existing aeration pond and conversion of the pond to emergency storage with the addition of an automatic emergency bypass valve.

III. APPLICABLE PLANS, POLICIES, AND REGULATIONS

The requirements contained in this Order are based on the applicable plans, policies, and regulations identified in section II of this Order. The applicable plans, policies, and regulations relevant to the discharge include the following:

A. Legal Authority

This Order is issued pursuant to regulations in the Clean Water Act (CWA) and the California Water Code (CWC), as specified in the Finding contained at section II.C of this Order.

B. California Environmental Quality Act (CEQA)

This Order meets the requirements of CEQA as specified in the Finding contained at section II.E of this Order.

C. State and Federal Regulations, Policies, and Plans

1. **Water Quality Control Plans.** This Order implements the Water Quality Control Plan, Fourth Edition (Revised October 2007) for the Sacramento and San Joaquin River Basins as specified in the Finding contained at section II.H of this Order.
2. **National Toxics Rule (NTR) and California Toxics Rule (CTR).** This Order implements the NTR and CTR as specified in the Finding contained at section II.I of this Order.
3. **State Implementation Policy (SIP).** This Order implements the SIP as specified in the Finding contained at section II.J of this Order.
4. **Alaska Rule.** This Order is consistent with the Alaska Rule as specified in the Finding contained at section II.L of this Order.
5. **Antidegradation Policy.** As specified in the Finding contained at section II.N of this Order and as discussed in detail in the Fact Sheet (Attachment F, Section IV.D.4.) the discharge is consistent with the antidegradation provisions of 40 CFR section 131.12 and State Water Board Resolution 68-16.
6. **Anti-Backsliding Requirements.** This Order is consistent with anti-backsliding policies as specified in the Finding contained at section II O of this Order. Compliance with the Anti-Backsliding requirements is discussed in the Fact Sheet (Attachment F Section IV.D.3.).
7. **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) (EPCRA) 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 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 there are constituents present in the effluent that have a reasonable potential to cause or contribute to exceedances of water quality standards and require inclusion of effluent limitations based on federal and state laws and regulations.

8. **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.
9. **Endangered Species Act.** This Order is consistent with the Endangered Species Act as specified in the Finding contained at section II.P of this Order.

D. Impaired Water Bodies on CWA 303(d) List – Not Applicable

E. Other Plans, Policies 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.

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 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 Basin Plan at 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) USEPA’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 includes numeric site-specific water quality objectives and narrative objectives for toxicity, chemical constituents, discoloration, radionuclides 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). 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 narrative chemical constituents objective 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 Basin Plan further states that, to protect all beneficial uses, the Regional Water Board may apply limits more stringent than MCLs. 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."*

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.

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 40 CFR 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 BOD₅, TSS, and pH.

2. Applicable Technology-Based Effluent Limitations

- a. **BOD₅ and TSS.** Federal Regulations, 40 CFR, Part 133, establish the minimum weekly and monthly average level of effluent quality attainable by secondary treatment for BOD₅ and TSS. Tertiary treatment is necessary to protect the beneficial uses of the receiving stream and the final effluent limitations for BOD₅ and TSS are based on the technical capability of the tertiary process. BOD₅ is a measure of the amount of oxygen used in the biochemical oxidation of organic matter. The secondary and tertiary treatment standards for BOD₅ and TSS are indicators of the effectiveness of the treatment processes. The principal design parameter for wastewater treatment plants is the daily BOD₅ and TSS loading rates and the corresponding removal rate of the system. In applying 40 CFR Part 133 for weekly and monthly average BOD₅ and TSS limitations, the application of tertiary treatment processes results in the ability to achieve lower levels for BOD₅ and TSS than the secondary standards currently prescribed; the 30-day average BOD₅ and TSS limitations have been revised to 10 mg/L, which is technically based on the capability of the new tertiary system. In addition to the average weekly and average monthly effluent limitations, a daily maximum effluent limitation for BOD₅ and TSS is included in the Order to ensure that the treatment works are not organically overloaded and operate in accordance with design capabilities. 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 BOD₅ 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 BOD₅ and TSS over each calendar month.

Final discharge limitations in this Order are based on the technical capability of tertiary wastewater treatment systems. Technology based limitations are utilized to assure the treatment systems are properly designed and operated. Discharge limitations have been established for tertiary treatment or equivalent as 10 mg/L (monthly average), 15 mg/L (weekly average) and 30 mg/L (daily maximum) for both BOD₅ and TSS.

- b. **Flow.** The Facility was designed to provide a tertiary level of treatment for up to a design flow of 0.72 MGD. Therefore, this Order contains an ADWF effluent limit of 0.72 MGD.
- c. **pH.** The secondary treatment regulations at 40 CFR Part 133, also require that pH be maintained between 6.0 and 9.0 standard units. In a letter dated

3 February 2009, the Discharger requested an upper effluent pH limitation of 8.0 which reflects the Facility's actual process limit. Data collected since the new treatment facility went into operation indicate that the Discharger can comply with this limitation. Therefore, at the request of the Discharger, this Order established a more stringent upper pH limitation of 8.0.

**Summary of Technology-based Effluent Limitations
Discharge Point No. 001**

Table F-4. Summary of Technology-based Effluent Limitations

Parameter	Units	Effluent Limitations			
		Monthly Average	Weekly Average	Daily Maximum	Daily Average
Average Dry Weather Flow	MGD	--	--		0.72
Biochemical Oxygen Demand (5-day @ 20°C)	mg/L	10	15	30	--
	lbs/day ¹	60	90	180	--
Total Suspended Solids	mg/L	10	15	30	--
	lbs/day ¹	60	90	180	--

¹ Based upon an average dry weather flow of 0.72 MGD.

Percent Removal: The average monthly percent removal of BOD₅ and TSS shall not be less than 85 percent.

C. Water Quality-Based Effluent Limitations (WQBELs)

1. Scope and Authority

Section 301(b) of the CWA and 40 CFR 122.44(d) require that permits include limitations more stringent than applicable federal technology-based requirements where necessary to achieve applicable water quality standards.

40 CFR 122.44(d)(1)(i) mandates that permits include effluent limitations for all pollutants that are or may be discharged at levels that have the reasonable potential to cause or contribute to an exceedance of a water quality standard, including numeric and narrative objectives within a standard. Where reasonable potential has been established for a pollutant, but there is no numeric criterion or objective for the pollutant, WQBELs must be established using: (1) USEPA criteria guidance under CWA section 304(a), supplemented where necessary by other relevant information; (2) an indicator parameter for the pollutant of concern; or (3) a calculated numeric water quality criterion, such as a proposed state criterion or policy interpreting the state's narrative criterion, supplemented with other relevant information, as provided in 40 CFR 122.44(d)(1)(vi).

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

The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the plan. In addition, the Basin Plan implements State Water Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply.

The federal CWA section 101(a)(2), states: "*it is the national goal that wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife, and for recreation in and on the water be achieved by July 1, 1983.*" Federal Regulations, developed to implement the requirements of the CWA, create a rebuttable presumption that all waters be designated as fishable and swimmable. Federal Regulations, 40 CFR sections 131.2 and 131.10, require that all waters of the State regulated to protect the beneficial uses of public water supply, protection and propagation of fish, shell fish and wildlife, recreation in and on the water, agricultural, industrial and other purposes including navigation. Section 131.3(e), 40 CFR, defines existing beneficial uses as those uses actually attained after 28 November 1975, whether or not they are included in the water quality standards. Federal Regulation, 40 CFR section 131.10 requires that uses be obtained by implementing effluent limitations, requires that all downstream uses be protected and states that in no case shall a state adopt waste transport or waste assimilation as a beneficial use for any waters of the United States.

- a. **Receiving Water.** Magnolia Creek is a tributary to Bear River within the Bear River Hydrologic Unit, Upper Bear HA, and Lake Combie HSA. Refer to Section II.H for beneficial uses.
- 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 general formulation of the criteria 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 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 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 establishing WQBELs, water quality criteria for acute and chronic copper, acute and chronic chromium III, acute and chronic nickel, acute and chronic zinc, and chronic cadmium were developed using the lowest effluent hardness value 55 mg/L. Water quality criteria for acute cadmium, acute and chronic lead, and acute silver were developed using the lowest receiving water hardness value 78 mg/L.

- c. **Assimilative Capacity/Mixing Zone.** Based on the available information, the worst-case dilution is assumed to be zero to provide protection for the receiving water beneficial uses. The impact of assuming zero dilution/assimilative capacity within the receiving water is that the discharge limitations are end-of-pipe limits with no allowance for dilution within the receiving water.

3. Determining the Need for WQBELs

- a. 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.

- b. **Constituents with No Reasonable Potential.** WQBELs are not included in this Order for constituents that do not demonstrate reasonable potential; however, monitoring for those pollutants is established in this Order as required by the SIP. If the results of effluent monitoring demonstrate reasonable potential, this Order may be reopened and modified by adding an appropriate effluent limitation.
- c. **Constituents with Reasonable Potential.** 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 ammonia, nitrate, and nitrite. WQBELs for this constituent are included in this Order
- d. WQBELs were calculated in accordance with section 1.4 of the SIP, as described in Attachment F, Section IV.C.4.
- e. **Aluminum.** USEPA developed National Recommended Ambient Water Quality Criteria for protection of freshwater aquatic life for aluminum. The recommended 4-day average (chronic) and 1-hour average (acute) criteria for aluminum are 87 µg/L and 750 µg/L, respectively, for waters with a pH of 6.5 to 9.0. USEPA recommends that the ambient criteria are protective of the aquatic beneficial uses of receiving waters in lieu of site-specific criteria. The USEPA criteria are based on studies with waters in a pH range of 6.5-6.8 and low hardness (<10 mg/L as CaCO₃). Based on the minimum hardness measured in the effluent of 55 mg/L and the minimum pH measured in the effluent of 6.6, and no receiving water dilution, it is appropriate to establish the aluminum effluent limitation using the chronic criterion. The previous Order No. R5-2002-0095 contained 87 µg/L as a 4-day average and 750 µg/L as a 1-hour average as effluent limitations.

The maximum effluent concentration (MEC) for aluminum was 1,820 µg/L, based on 24 samples collected between 1 September 2005 and 31 August 2007 during the operation of the old treatment system where alum was added as a coagulant prior to filtration. There is no receiving water concentration available. After the new treatment system went on line alum was no longer used as a coagulant. The MEC for aluminum was 25.5 µg/L, based on 36 samples collected between July 2008 and December 2008. The alum appears to have been the primary source of aluminum in the effluent. Therefore, aluminum in the discharge from the new treatment system no longer has 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.

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

Therefore, based on operation of a new treatment system and new monitoring information, this Order does not contain an effluent limitation for aluminum. This action is consistent with the antibacksliding provisions (See Section IV.D.3). Quarterly monitoring is included in this Order for aluminum for the first 3 years after permit adoption. Should monitoring results indicate that the discharge has the reasonable potential to cause or contribute to an exceedance of a water quality standard, this Order may be reopened and modified by adding an appropriate effluent limitation.

- f. **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 or CMC) standards based on pH and chronic (30-day average; criteria continuous concentration or CCC) standards based on pH and temperature. USEPA also recommends that no 4-day average concentration should exceed 2.5 times the 30-day CCC. 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 Magnolia Creek has a beneficial use of cold freshwater habitat and the presence of salmonids and early fish life stages in Magnolia Creek are well documented, the recommended criteria for waters where salmonids and early life stages are present were used.

The previous Order contained "floating" effluent limitations for ammonia. This Order contains effluent limitations for ammonia to assure the treatment process adequately nitrifies the waste stream to protect the aquatic life beneficial uses. Effluent limitations for ammonia in this Order are fixed year-round limitations that are based on reasonable worst-case conditions.

The maximum permitted effluent pH is 8.5. However, the Discharger requested the maximum pH in the effluent be restricted to 8.0. The Discharger's request is more restrictive than the Basin Plan objective for pH. In order to protect against

the worst-case short-term exposure of an organism, a pH value of 8.0 was used to derive the acute criterion. The resulting acute criterion is 5.62 mg/L.

Because Magnolia Creek is sometimes dominated by the effluent, effluent temperature and pH data from the Discharger's monthly monitoring reports from September 2002 through August 2007 were used to develop the chronic criteria that provide for a representative analysis consistent with USEPA ammonia guidance criteria. This time period is larger than that used for other constituents because temporary discharge limitations prior to upgrading to tertiary treatment limited the number of data points collected from September 2005 through August 2007 period. The CCC for ammonia varies with pH and temperature. Using effluent data from 1 September 2002 through August 2007, the CCC was calculated for each day when temperatures and pH were measured. Intermittent discharge made calculations of a 30-day average CCC impracticable at times. Thus, the lowest 99.9% single day CCC of 4.10 mg N/L, was conservatively used to represent the lowest 99.9% 30-day average CCC for this particular discharger. The USEPA recommended maximum 4-day average concentration is 2.5 times the 30-day average CCC or 10.3 mg N/L as a 4-day average.

The maximum permitted effluent limitations for ammonia are 2.5 mg/L (as N) for the average monthly effluent limitation (AMEL) and 5.6 mg/L (as N) for the daily maximum effluent limitation (MDEL). (See section IV.C.4, Table F-6, of the Fact Sheet for calculations of the AMEL and MDEL for ammonia.) Effluent limitations for ammonia are included in this Order to assure the treatment process adequately nitrifies the waste stream to protect the aquatic habitat beneficial uses.

The MEC for ammonia was 25.4 mg/L, based on 46 samples collected between 1 September 2005 and 31 August 2007, during the operation of the old treatment system. There is no receiving water concentration available. The MEC for ammonia was 1.30 mg/L based on 55 samples after the new treatment system went into operation. The maximum monthly average since the new treatment facility went into operation was 0.50 mg/L, based on 55 samples collected between June 2008 and December 2008. Based on the sample results after the new treatment system became operational, it appears that the Discharger will be in compliance with effluent limitations upon issuance of the permit.

- g. **Chlorine Residual.** The previous Order No. R5-2002-0095 contained effluent limitations for chlorine residual. The Discharger has eliminated the use of chlorine for disinfection and sulfur dioxide for dechlorination. The new treatment system uses UV for disinfection. Therefore, based on operation of a new treatment system that no longer uses chlorine for disinfection, this Order does not contain an effluent limitation for chlorine. This action is consistent with the antibacksliding provisions (see Section IV.D.3).

The Discharger may continue to use chlorine for cleaning the MBR membranes. This Order contains a prohibition for discharge of wastewater to surface waters that contains chlorine. The Discharger intends to monitor chlorine residual during