

Staff Report

Placer County Department of Facility Services
Placer County Sewer Maintenance District No. 1
Wastewater Treatment Plant
Placer County

Treatment System

Placer County Department of Facility Services, Placer County Sewer Maintenance District No. 1 (Discharger) owns and operates a wastewater collection, treatment, and disposal system, and provides sewerage service to the unincorporated area of North Auburn in Placer County, which serves a population of approximately 15,000 and includes most of the industrial area of the City of Auburn.

The WWTP currently provides tertiary treatment when influent flows are 3.5 mgd or less and a mixture of secondary and tertiary treatment when flows are greater than 3.5 mgd. The WWTP consists of the following: Headworks: influent flow meter, comminution, and aerated grit removal; Primary Clarification: two rectangular primary clarifiers; Secondary Treatment: three Rotating Biological Contactors (RBCs), two trickling filters, and four circular clarifiers; Intermediate and final clarification is provided by the four circular clarifiers; Gravity Filtration: six gravity filters with anthracite media; Disinfection: three chlorine contact chambers and dechlorination; Sludge Treatment: primary and secondary digesters, belt press, and sludge drying beds; sludge is treated in the digesters and removed to the belt press or sludge drying beds for liquid removal. The dewatered sludge is disposed at a landfill.

Receiving Waters

Treated municipal wastewater is discharged Rock Creek. The discharge point on Rock Creek is approximately 200 feet upstream of Dry Creek. In approximately 1.7 miles, Dry Creek merges with Orr Creek and is called Coon Creek. In western Placer and eastern Sutter Counties, downstream of the NID Diversion Dam, Coon Creek flows approximately 25 miles through a relatively flat area where the flow meanders and splits into several channels, including Main Canal, Bunkham Slough, Markham Ravine, and East Side Canal. Flow from these channels eventually enters Natomas Cross Canal. Flow from Natomas Cross Canal enters the Sacramento River just below the confluence with the Feather River. The total distance from the discharge point on Rock Creek to the Sacramento River is approximately 34.5 miles. In addition a Nevada Irrigation District (NID) Diversion Dam pulls water from Coon Creek into Camp Far West Ditch or Canal. Water from Camp Far West Ditch follows several flow paths to the Bear River, which is tributary to the Feather River and the Sacramento River.

Beneficial Uses

The permit and Information Sheet exhaustively discuss the beneficial uses of the receiving stream and downstream waters. The beneficial uses are summarized in this staff report from the permit and Information Sheet. The Basin Plan identifies existing and potential beneficial uses for bodies of water to which Rock Creek, Dry Creek, and Coon Creek are tributary, as follows:

- a. The discharge ultimately enters a section of the Sacramento River between the Colusa Basin Drain and I Street Bridge, the first body of water downstream of Rock Creek, via Natomas Cross Canal, for which the Basin Plan has identified existing beneficial uses. The beneficial uses of the Sacramento River, between the Colusa Basin Drain and I Street Bridge, as identified in Table II-1 of the Basin Plan, are municipal and domestic supply, agricultural irrigation, water contact recreation including canoeing and rafting, non-contact water recreation including aesthetic enjoyment, warm and cold freshwater habitats including preservation or enhancement of fish and invertebrates, migration habitat for warm and cold water species, warm and cold water spawning habitat, wildlife habitat, and navigation. Other beneficial uses identified in the Basin Plan apply to the Sacramento River, between the Colusa Basin Drain and I Street Bridge, including groundwater recharge, freshwater replenishment, and preservation of biological habitats of special significance (including the Sacramento San Joaquin Delta).

- b. Rock Creek, Dry Creek, and Coon Creek are also tributary to Camp Far West Reservoir and the Bear River via Camp Far West Ditch. The Bear River is the first body of water downstream of Rock Creek, for which the Basin Plan has identified existing beneficial uses. Table II-1 of the Basin Plan identifies existing and potential beneficial uses for the Bear River, including municipal and domestic supply, agricultural irrigation and stock watering, power supply, water contact recreation including canoeing and rafting, non-contact water recreation including aesthetic enjoyment, warm and cold freshwater habitats including preservation or enhancement of fish and invertebrates, migration habitat for warm and cold water species, warm and cold water spawning habitat, and wildlife habitat. Other beneficial uses identified in the Basin Plan apply to the Bear River, including groundwater recharge and freshwater replenishment. Upon review of the flow conditions, habitat values, and beneficial uses of Coon Creek, Dry Creek, and Rock Creek, the beneficial uses identified in the Basin Plan for the Bear River are applicable to Coon Creek, Dry Creek, and Rock Creek.

In reviewing whether existing and potential uses of the Sacramento River, between the Colusa Basin Drain and the I Street Bridge, and for the Bear River, are applicable to Coon Creek, Dry Creek, and Rock Creek, the following facts were considered:

Municipal and Domestic Supply and Agricultural Irrigation and Stock Watering Supply:

Municipal, domestic and food crop irrigation beneficial uses have been site-specifically confirmed for waters downstream of the wastewater treatment plant and State Board Resolution No. 88-63 requires the Regional Board to assign the beneficial uses of municipal and domestic supply, to Rock Creek, Dry Creek, and Coon Creek.

The State Water Resources Control Board (SWRCB) has issued numerous water rights, for domestic and irrigation uses, on Main Canal and downstream waters, the Sacramento River, the Bear River, and the Feather River, downstream of the discharge. Many of the waterways downstream of the discharge are managed by irrigation districts and retain the domestic and irrigation beneficial uses. Nevada Irrigation District (NID) controls the flows in Dry Creek, Coon Creek, and Camp Far West Ditch. Staff of NID confirmed the existence of domestic uses of this water by reporting that water from Camp Far West Ditch is utilized for in-home use. NID requires the homeowner to purchase 5 gallons of bottled drinking water per month. NID sells water from Coon Creek and Camp Far West Ditch and has assessed the principal uses as family garden use and pasture irrigation. Over a distance of approximately 25 miles on Camp Far West Ditch, there are 37 irrigation customers, two of whom have irrigation water connected to their homes.

Riparian Rights, for landowners along streams and rivers, are not recorded with the SWRCB and have precedence over other water rights and may include domestic and municipal uses. The wastewater discharge occurs in a residential area and the effluent immediately flows through numerous yards lining the Creek. Home garden irrigation has been identified as an existing beneficial use of the receiving stream.

Water Contact and Non-contact Water Recreation (including canoeing, rafting, and aesthetic enjoyment)

Regional Board staff surveyed the residents along Dry Creek and found recreational and irrigation use of the receiving stream commonly cited. Several swimming and picnic areas were observed on the banks of Dry Creek and Coon Creek. Properties along Dry Creek and upper Coon Creek are single-family

dwellings. The properties have relatively flat terrain that slopes down to the Creeks in their back yards. There is easy public access to Rock Creek, Dry Creek, Coon Creek, Camp Far West Ditch, Camp Far West Reservoir, the Bear River, the Feather River, and to the sloughs and canals that are downstream of Coon Creek, Natomas Cross Canal, and the Sacramento River. Public use is likely to increase as the population increases. Exclusion or restriction of public use is unrealistic.

Hikers and campers, in the relatively uninhabited areas near the discharge point, Rock Creek, Dry Creek, upper Coon Creek, and Camp Far West Ditch have a reasonable expectation that those waters are as unpolluted as similar streams in the vicinity.

Camp Far West Reservoir, the Bear River, the Feather River, and the Sacramento River are also used extensively for contact and non-contact recreation.

Warm and Cold Freshwater Habitats (including preservation and enhancement of fish, invertebrates, and other aquatic resources), Warm and Cold Spawning Habitats, Warm and Cold Migration Habitats, and Wildlife Habitat

The wastewater is discharged into Rock Creek, which flows into Dry Creek, Coon Creek, and downstream waters. The California Department of Fish and Game (DFG) has verified the presence of fish species consistent with both warm water fisheries and cold-water fisheries for salmonids. Fish surveys have not been extensively conducted in the immediate receiving streams, however DFG staff have confirmed that oversummering of cold-water fish species in deeper pools within the Creek is reasonable. Riparian habitats are also a by-product of drainages and canals and provide numerous habitats for birds and mammals.

Upstream of the discharge from the WWTP, flows in Rock Creek and Dry Creek are both dependent on the flows released from upstream reservoirs. General information, from U.S. Geological Survey maps and site visits, indicates that Rock Creek and Dry Creek were intermittent streams prior to the year-round discharge. Based on the available information, Rock Creek and Dry Creek currently are low-flow or intermittent streams in the absence of the discharge from the WWTP or the upstream reservoirs. Due to the low-flow/intermittent nature of the flows in the Creeks, no credit for receiving water dilution is available. Although the discharge flows may maintain aquatic habitat during low flow conditions, constituents may not be discharged that may cause harm to aquatic life. At other times, natural flow and released flows help support cold-water aquatic life. Dry weather and low flow conditions occur primarily in the summer months but also occur throughout the year, particularly in low rainfall years. Significant dilution may occur

during and after high rainfall events. However, the lack of available dilution during low flow periods results in more stringent effluent limitations to protect recreational uses, drinking water supplies, agricultural irrigation supplies, and aquatic life.

At times, treated wastewater may be the main (or only) source of stream flow, with little or no dilution from natural flow, particularly in Rock Creek. The worst-case dilution in Rock Creek and Dry Creek is assumed to be zero to provide protection for the receiving water beneficial uses. The impact, of assuming zero dilution within the receiving water, is that discharge limitations must be end-of-pipe limits, rather than allowing for dilution provided by the receiving water.

Wastewater Regionalization

The Discharger has actively pursued wastewater regionalization at the new City of Lincoln wastewater treatment plant for numerous Placer County treatment systems, including SMD-1. The City of Lincoln has fully supported the regionalization efforts by constructing an “expandable” wastewater treatment plant and constructing an oversized influent pipeline to the City limits. To date the Discharger has been successful in securing significant federal funding for planning, environmental review and preliminary design work. Environmental analysis, both CEQA and NEPA, have not yet begun. There is a sequential chain of events that must occur before the SMD-1 facility could reasonably be expected to tie-into the regional system. The new development of Bickford Ranch and the City of Auburn lie between SMD-1 and the SMD-1 service area. The Bickford Ranch development is being challenged on environmental issues. The City of Auburn has committed to wastewater regionalization, yet has not conducted a cost effective analysis. Additional federal funding, which has not yet been appropriated, is necessary for regionalization to move forward. To date, none of the potential dischargers to the regional facility have made a financial commitment to construct the necessary discharge pipeline or to purchase capacity at Lincoln. The Discharger has, however asked the Regional Board to extend compliance dates for ammonia, nitrates, CTR constituents and equivalent to tertiary treatment based discharge limitations in the permit until a final determination has been made regarding wastewater regionalization. The Discharger has proposed that by 2 January 2008, based on the outcome of the environmental analysis, the status of additional federal funding, completion of a cost effective analysis and a regional wastewater commitment by Bickford Ranch and the City of Auburn, a determination can be made regarding whether wastewater regionalization is the appropriate means of achieving compliance for the SMD-1 wastewater treatment plant. If regionalization is selected, this information would be considered “new information” under federal regulations, 40 CFR 122.44 (l)(i)(B)(1), and this Order may be reopened for reconsideration of the compliance periods in accordance with applicable laws and regulations. After 2 January 2008, if wastewater regionalization is not the

selected compliance alternative, the Discharger has agreed that there would be sufficient time remaining under the currently included compliance period to complete and implement measures to achieve full compliance with the permit.

Tertiary Treatment

Rock and Dry Creeks, prior to construction of the WWTP and upstream reservoirs, were low flow or intermittent streams during dry weather and contained water primarily during wet weather. Since construction of the upstream reservoirs and the WWTP, during dry weather and low flow periods, Rock Creek and Dry Creek may, at times be dominated by wastewater effluent. During low flow periods, Rock and Dry Creeks provide little or no dilution for wastewater effluent discharged from the WWTP. The wastewater discharged from the WWTP into Rock Creek, and downstream waters, is reused for municipal, domestic, contact recreation, agricultural irrigation, aquatic life and other beneficial uses. To protect these beneficial uses, the Regional Board finds that the wastewater must be disinfected and adequately treated to prevent disease.

The principal infectious agents (pathogens) that may be present in raw sewage are classified into three broad groups: bacteria, parasites, and viruses. Tertiary treatment, consisting of chemical coagulation, sedimentation, and filtration, has been found to remove approximately 99.5% of viruses. The filtration process is an effective means of reducing viruses and parasites from the waste stream. The wastewater must be treated to tertiary standards (filtered) to protect contact recreation and food crop irrigation uses.

In the California Code of Regulations, Title 22, Division 4, Chapter 3 (Title 22), the California Department of Health Services (DHS) has developed standards for the reuse or reclamation of wastewater. Title 22 requires, for reuse of wastewater for spray irrigation of food crops, parks, playgrounds, schoolyards, other areas of similar public access, and unrestricted contact recreation, that wastewater be adequately disinfected, oxidized, coagulated, clarified, and filtered, and that the total coliform organism levels in the effluent not exceed 2.2 MPN/100 ml (Most Probable Number per 100 milliliters), as a 7-Day Median. The required level of treatment is tertiary or equivalent. The Title 22 standards are the minimum wastewater treatment standards necessary to protect public health when wastewater is reused for beneficial uses. There are wastewater treatment processes that provide an equivalent pathogen removal, such as membrane technologies, which could also be utilized to protect the beneficial uses of the receiving stream.

The requirement to provide tertiary treatment, or equivalent, is based on Regional Board staff's documentation of contact recreation, food crop irrigation and municipal and domestic uses of the receiving stream. Tertiary or equivalent treatment is consistent with the technical analysis conducted to develop the reclamation requirements of California

Code of Regulations Title 22, and recommendations from the California Department of Health Services (DHS) contained in *Wastewater Disinfection for Health Protection* (1987), *Technical Justification for the Dilution Ratio for Secondary Effluent* (SDHS), the *Uniform Guidelines for the Disinfection of Wastewater* (1987) and the *Department of Health Services Recommendations for Waste Discharge Requirements* (1 July 2003).

Coagulation and filtration are also effective processes for reducing concentrations of some metals and other pollutants from the waste stream. Discharge of unfiltered water may result in an increase in violations of effluent limitations for some metals that are primarily based on toxicity to aquatic life.

Tertiary treatment, or equivalent, is necessary to protect the beneficial uses of the receiving stream. The Discharger's wastewater treatment system provides tertiary treatment. However, flows greater than 3.5 mgd are routed around the gravity filters to the chlorine contact basins. However, excessive wet weather flows, due to inflow and infiltration (I/I), have exceeded 8 mgd. Currently, flows in excess of 3.5 mgd will receive a secondary level treatment but be routed around the gravity filters and flow directly to the chlorine contact basins. Wastewater discharged during periods of high flow is some combination of tertiary and secondary. The permit requires tertiary treatment, or equivalent, for all flows less than 3.5 mgd and utilization of the coagulation and filtration processes to the max extent practicable during wet weather.

Prior to permit renewal, anticipating a requirement to provide full tertiary treatment, the Discharger consulted with DHS staff. In a 15 July 2003 letter to Regional Board staff regarding conditions at SMD1 specifically, after their review of costs to expand to year-round tertiary and the high influent flow rates, DHS noted several exceptions to the need for tertiary treatment at SMD1 as follows:

- "1. The plant is subject to very high flow rates during, and immediately following storm events. Plant flow that exceeds the capacity of the filters can be allowed to bypass the filtration process during these events, provided the filter capacity is at least 30% greater than the permitted average dry weather flow.*
- 2. A 30-day median coliform bacteria count of 2.2 MPN/100 ml can be allowed during the cold weather season. This season can be defined either on the basis of months (e.g., November 1 through April 30), or by receiving water temperature. If you decide to implement the latter, we recommend that the 'cold weather season' be defined as beginning when the seven day median receiving water temperature first falls below 60°F, and ending when the seven-day median receiving water temperature first rises above 60°F."*

A discharge in accordance with the DHS recommendation will not protect contact recreation, food crop irrigation and domestic and municipal beneficial uses during

periods when the receiving water temperature is less than 60° F and treatment plant effluent flows exceed 3.5 mgd. The beneficial uses of the receiving waters immediately downstream of the discharge have been well documented. There is no documentation that water contact recreational activities cease at 60° F, to the contrary the nearby American River has well documented periods of contact recreational activity when water temperatures are below 60 ° F. The discharge of blended secondary effluent, compared to a full tertiary discharge, will result in the discharge of additional pollutants. The assessment of compliance with CTR standards and water quality objectives was based on tertiary treatment, and the blended discharge will likely not comply, threatening to degrade numerous beneficial uses, including the protection of aquatic life and drinking water. To protect the public health for confirmed downstream domestic uses, such as the City of Jackson, DHS has recommended that tertiary plus 20-to-1 dilution is necessary to protect domestic beneficial uses. Domestic uses have been documented to exist downstream of SMD-1. The Regional Board finds that a tertiary level of treatment, or equivalent, is necessary to protect the beneficial uses of the receiving stream.

The Discharger's wastewater system has a high wet weather peaking factor, allowing elevated wet weather flows into the collection system. Reduction of I/I flows into the collection system will reduce the need for additional filtration. This Order includes a Provision that requires the Discharger to complete and implement an effective I/I reduction plan.

The permit requires that the Discharger may not discharge unfiltered wastewater in any amount, unless the influent flow is greater than 3.5 mgd and the 7-Day Median receiving water temperature is less than 60 °F. This Order contains effluent limitations for tertiary treated wastewater when flow is less than or equal to 3.5 mgd for Total Coliform Organisms, BOD, TSS, and Turbidity. When flow is greater than 3.5 mgd and Temperature is less than 60 °F as a 7-Day Median, this Order contains an effluent limitation for Total Coliform Organism of 2.2 MPN/100 ml as a 30-Day Median as recommended by DHS. To accommodate the discharge of commingled tertiary/secondary wastewater, this Order also contains interim effluent limitations for BOD, TSS, and turbidity that are less stringent than tertiary limits. As recommended by DHS, when discharging commingled wastewater, additional weekly monitoring is required for Total Coliform Organisms, Fecal Coliform Organisms, *Escherichia coli*, and Salmonella bacteria. In order to determine when the temperature of the receiving water has achieved less than 60 °F as a 7-Day Median, additional temperature monitoring will be necessary. The existing flow measurements in Rock Creek, Dry Creek, and plant effluent flow monitoring are not adequate for high flows and this Order requires they be upgraded to accurately measure dilution flow ratios while discharging less than tertiary quality effluent. To determine compliance with the lesser treatment requirements recommended by DHS, additional flow measurement will be required for the effluent

from the plant, effluent from the gravity filters, flow to the chlorine contact basins, and flows in Rock and Dry Creeks.

The permit contains Effluent Limitations less stringent than full tertiary treatment limits during wet weather flow periods when the receiving water temperature is less than 60° F, as recommended by DHS. Tertiary treatment, or equivalent, is necessary to protect the designated beneficial uses of contact recreation, food crop irrigation and domestic and municipal supply. Similar local communities, some with higher wet weather peaking factors, Auburn, Placerville, El Dorado Hills and Cameron Park all provide, or are in the process of completing projects to provide, full tertiary treatment for wet weather flows. Upon expansion, the Regional Board finds that providing best practicable treatment or control (BPTC) of the discharge will require tertiary treatment for all flows.

Until the wastewater treatment facility is expanded or close to tying into the Regional Wastewater Plant, this Order allows a treatment level less than tertiary, or equivalent, during periods of high flow and cold temperature. This Order requires that the Discharger conduct an analysis to determine if bypassing filtration during these limited periods provides BPTC in accordance with State Board Resolution No. 68-16, the antidegradation policy. The BPTC analysis will be due prior to making a decision of whether regionalization is feasible and will require analysis of at least the following:

- Whether 20-to-1 dilution (receiving stream flows to effluent flow) exists during wet weather periods when filter capacity is exceeded,
- Identification and prioritization of wet weather flows in a comprehensive I/I reduction program to assess the amount of flow reduction that can be expected to be achieved,
- A flow equalization analysis to contain the “excess” wet weather flows,
- An analysis of tertiary treatment design parameters for dry and wet weather flow rates to determine the actual current dry and wet weather design of the filtration system,
- A treatability analysis to determine what treatment train will be necessary to comply with CTR limitations,
- An analysis of the SMD-1 system, what parameters make it, the service area and the downstream beneficial uses unique to receive relaxed wet weather effluent limitations in providing BPTC,
- A complete and thorough cost analysis of maximizing I/I reduction, providing additional treatment to comply with CTR based limitations, adding equalization basins, building additional filters, tying into the Regional Wastewater Plant and any (and all) other alternatives evaluated. The cost analysis must contain a detailed basis for the total costs and an assessment of monthly per household/increases for each alternative.

If wastewater regionalization is not the selected alternative and based on the findings of the BPTC analysis, this Order may be reopened and additional equivalent to tertiary discharge limitations may be added to protect the beneficial uses of the receiving waters.

The Basin Plan's surface water quality bacteria objective of 200 MPN/100 ml, for fecal coliform organisms, is based on Federal Standards for contact recreational use of surface waters. U.S. EPA, in the *Ambient Water Quality Criteria for Bacteria* (1986), estimates that compliance with the fecal coliform fresh surface water criteria of 200 MPN/100 ml will result in approximately eight illnesses per 1,000 swimmers. In a 28 September 2000 letter to Regional and District Engineers at DHS, the DHS stated that "Federal Standards for water quality where recreational bathing may occur were developed for freshwaters which are not directly influenced by sewage discharges (treated or untreated)." The DHS has documented the reduction of pathogens from various wastewater treatment processes. According to DHS; providing a secondary disinfected quality achieves a 1 to 4 log reduction and a tertiary disinfected quality achieves a 4 to 6 log reduction of viruses from raw sewage. The DHS projected that approximately one illness per 220 bathers would occur from recreation contact in secondary disinfected wastewater which drops to a more acceptable level of approximately one illness per 1,000 bathers with tertiary treatment.

The Discharger has estimated that the construction cost to achieve year-round filtration, with the same type of filters already at SMD1, is approximately \$1,000,000 per million gallons per day of additional capacity, or a minimum of \$5,000,000. This assumption is based on average dry weather design flow rates, utilizing the operational range of treatment systems at peak wet weather flow conditions, installation of sufficient additional filters could cost significantly less than projected by the City. Peak wet weather flow rate is the problematic parameter at this facility with respect to providing tertiary treatment. Other wastewater dischargers in the area successfully utilize more than one type of filtration. The costs to add the "same type" of filters at SMD-1 eliminates any opportunity for cost savings.

Regional Board and State Board staff gathered information relating to the City of Auburn Wastewater Treatment Plant improvements. The City of Auburn installed new continuous backwash Dynasand Filters to handle 6 mgd of flow. The cost of the filters and associated infrastructure was \$1.9 million. Included in the cost were concrete structures, pumps, a rapid mix tank, a chemical building, electrical work, piping, and the filters themselves. Accounting for inflation, the cost today would be approximately 20% higher, resulting in a cost of \$2.2 - \$2.3 million for filters and associated structures for a flow of 6 mgd. The approximate cost per million gallons would be \$370,000 – \$380,000.

The initial costs are less with the Dynasand Filters but operation and maintenance costs are higher than other filters.

The cost of additional filtration is only necessary to offset the cost to treat wet weather flows above 3.5 mgd. Reducing I/I flows would reduce the cost of additional filters. The cost of reducing I/I and the associated reduced need for additional filters could not be assessed with the available information.

Hardness and Effluent Limitations

Many of the pollutants limited in this Order are hardness and/or pH dependant. Information submitted by Nevada Irrigation District confirms that the water supply to the receiving stream is from various watersheds, which may have significantly different hardnesses. Review of the hardness data for the wastewater discharge also shows extended periods with high or low hardness indicating the varying sources of water supply. The low hardness of the receiving stream and the wastewater discharge could occur at the same time resulting in critical hardness values. Information submitted as a supplement to the Report of Waste Discharge shows, in part, the following critical hardness and pH values:

<u>Effluent Hardness</u>	<u>R-1 Hardness</u>	<u>Effluent pH</u>
61 mg/l	20 mg/l	6.2 pH units

The toxicity to aquatic life varies from several metals varies with hardness. As hardness concentrations decrease, the toxicity of these metals to aquatic life increases. The CTR Criteria for these metals and the Ambient Criteria for the Protection of Freshwater Aquatic Life are hardness-dependent. The monitoring data submitted by the Discharger contained effluent hardness data that ranged between 61 and 340 mg/l. In addition, the Discharger submitted hardness data for Rock Creek, upstream of the effluent discharge point, which ranged between 20 and 260 mg/l. As stated in Section 1.2 of the SIP, *“When implementing the provisions of this Policy, the RWQCB shall ensure that criteria/objectives are properly adjusted for hardness or pH, using the hardness or pH values for the receiving water...”* The worst-case conditions are represented when the hardness of Rock Creek is 20 mg/l. When assessing reasonable potential to cause or contribute to an in-stream excursion above water quality criteria, the upstream hardness of Rock Creek represents worst-case conditions. However, according to technical advise from SWRCB staff, Effluent Limitations based on upstream hardness may be overprotective, while the protection provided by Effluent Limits based on the hardness of

the effluent is not certain. According to guidance from the SWRCB, use of the downstream hardness to establish Effluent Limitations is protective of beneficial uses. Therefore, to protect the aquatic habitat beneficial uses of the receiving waters, new concentration-based final Effluent Limitations based on the CTR Criteria and the hardness of the combined flow of Rock Creek and the effluent (Monitoring Point R2), are included in this Order. While the worst-case hardness may be utilized to determine reasonable potential, the Effluent Limitations vary with hardness by utilizing the hardness-dependant equations.

Effluent Limits

Mercury - The reported concentrations of Mercury do not exceed the CTR Human Health criterion, therefore, a concentration-based Effluent Limitation is not proposed. However, the Effluent does contain a mass of Mercury, which may contribute to an increase in Mercury in the Sacramento-San Joaquin Delta. Therefore, a mass-based final Effluent Limitation for Mercury, in lbs/day, is included in the Order in accordance with the Code of Federal Regulations, 40 CFR 122.45(f).

Total coliform organisms – Requested seasonal limitations are not technically based and are not protective of the beneficial uses of the receiving stream since contact recreational, food crop irrigation and domestic uses can occur between November and May.

Tertiary treatment is generally considered to include primary and secondary treatment, with coagulation and filtration. U.S. EPA has not established performance standards for tertiary treatment. However, based on observed treatment capabilities, tertiary treatment is able to achieve both **BOD and TSS** levels of 10 mg/l as a Monthly Average, 15 mg/l as a Weekly Average, and 25 mg/l as a Daily Maximum, with a minimum 85% removal rate.

To provide Title 22 equivalent waters this Order contains final Effluent Limitations of 10 mg/l (Monthly Average), 15 mg/l (Weekly Average), and 25 mg/l (Daily Maximum), with a minimum 85% removal rate, for both BOD and TSS, when flow is less than or equal to 3.5 mgd. These Limitations are based on the design technical capability of tertiary treatment systems and no schedule is necessary for compliance. When flows are greater than 3.5 mgd, the gravity filters will be bypassed and the discharge from the plant will be some combination of tertiary and secondary treated wastewater. When flow is less than 3.5 mgd and the 7-Day Median temperature of the receiving water is less than 60 °F, and the filters are bypassed, this Order contains interim Effluent Limitations of 20 mg/l (Monthly Average), 30 mg/l (Weekly Average), and 50 mg/l (Daily Maximum), with an 85% removal rate. These effluent limits are midway between secondary and

tertiary treatment capabilities and were in the previous Order, therefore, no compliance schedule is necessary

Existing Order No. 97-113 contains seasonal **turbidity** Effluent Limitations of 2 NTU as a Monthly Average and 5 NTU as a Daily Maximum from 1 May through 31 October. The existing Order contains no Turbidity limitation between 1 November and 30 April. Title 22 criteria for filtered wastewater require that Turbidity not exceed; (a) an average of 2 NTU in a 24-Hour period, (b) 5 NTU more than 5% of the time in a 24-Hour period, and (c) 10 NTU at any time. To provide Title 22 equivalent water, this Order contains final Effluent Limitations of 2 NTU as a 24-Hour Average and a Daily Maximum between 5 NTU and 10 NTU, as described above, when flow is less than or equal to 3.5 mgd. In the interim, this Order contains no turbidity limitations when flow is greater than 3.5 mgd and the 7-Day Median temperature of the receiving water is less than 60 °F. There are also year-round Receiving Water Limitations for Turbidity based on Basin Plan numeric standards.

The Basin Plan includes a water quality objective for **oil and grease** in surface waters, which states “*Waters shall not contain oils, greases, waxes, or other materials in such 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.*”

Section III of the Basin Plan contains a numeric Water Quality Objective for **pH**. Numeric Water Quality Objectives are commonly applied to the receiving water as Receiving Water Limitations. However, in this case, the flow of the receiving water has been characterized as a low flow/intermittent stream providing no dilution. Therefore, end-of-pipe Effluent Limitations for pH were included in previous Order No. 97-113 and in this Order. Receiving Water Limitations for pH are also included in the Order to be protective of the Water Quality Objectives.

Section III of the Basin Plan contains Water Quality Objectives for the Central Valley Region. The Pesticide Water Quality Objectives, on page III.6.00 of the Basin Plan, states “*Total identifiable **persistent chlorinated hydrocarbon pesticides** shall not be present in the water column at concentrations detectable within the accuracy of analytical methods approved by the Environmental Protection Agency [U.S. EPA] or the Executive Officer.*”

Settleable Solids - the previous Order and the proposed Order contain Effluent Limitations for Settleable Solids at 0.1 ml/l as a 30-Day Average and 0.2 ml/l as a Daily Maximum.

The Basin Plan narrative **Toxicity** Water Quality Objective, on Page III-8.00, states: “all waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal or aquatic life”. This Order does not allow dilution within the receiving stream. The previous Order and this Order contain an Effluent Limitation that requires that the survival of aquatic organisms in 96-hour bioassays of undiluted waste shall be no less than 70% for any one bioassay and 90% for the median of three or more consecutive bioassays. This Order and the corresponding Monitoring and Reporting Program also prescribe chronic toxicity monitoring and reporting protocols.

Aluminum can be toxic to aquatic organisms. Based on information submitted by the Discharger, Polyaluminum Hydroxychloride may be used as a coagulant before the wastewater flows to the gravity filters. The use of this coagulant increases the reasonable potential for the discharge of elevated concentrations of Aluminum to cause or contribute to an in-stream excursion above the Basin Plan prohibition against the discharge of toxic constituents in toxic concentrations. The low pH and the low hardness cited in the U.S. EPA ambient criteria document exist here and are applicable to the discharge. The elevated concentrations of aluminum in the wastewater discharge present a reasonable potential to cause aquatic toxicity. The Basin Plan contains a narrative objective prohibiting the discharge of toxic constituents that cause toxicity within the receiving stream. With respect to narrative objectives, the Regional Board must establish effluent limitations using one or more of three specified sources, including EPA’s published water quality criteria. [(40 CFR 122.44(d)(1)(vi)(A), (B), or (C)]. In this case, it is appropriate to use U.S. EPA’s water quality criteria. U.S. EPA’s ambient water quality criteria for aluminum are applicable to the discharge. The wastewater effluent has been measured at a low pH of 6.8, and the receiving stream hardness has been measured as low as 20 mg/l, which is directly applicable to the criteria. EPA recommends application of the criteria as necessary to protect aquatic life absent a site-specific limitation. The limitation for aluminum is reasonable and necessary to prevent aquatic toxicity from the wastewater discharge.

For Aluminum, U.S. EPA has developed Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life. The recommended Acute or Maximum Concentration (1-Hour Average) for Aluminum is 750 µg/l and the Chronic or Continuous Concentration (4-Day Average) is 87 µg/l, (both expressed as Total Recoverable Aluminum). U.S. EPA recommends that the ambient criteria are protective of the aquatic beneficial uses of receiving waters in lieu of site-specific criteria. In personal communications U.S. EPA water quality staff stated that at low hardness and pH, as is observed from the Dischargers WWTP, the acute and chronic values recommended in the ambient criteria document for aluminum are necessary to protect aquatic life.

Effluent monitoring results submitted by the Discharger (see Table 1 of the Information Sheet) indicated the presence of Total Recoverable Aluminum, in twelve samples, at concentrations of 11.8, 12.8, 25.1, 27.2, 27.4, 28.7, 37.7, 59.0, 61.0, 256, 274, and 404 µg/l. The three highest concentrations were above the Chronic Criteria. New Effluent Limitations for Aluminum have been included in this Order to protect the receiving stream aquatic life beneficial uses based on U.S. EPA's recommended aquatic criteria, and have been established at the Ambient Water Quality Criteria for Aluminum.

Untreated domestic wastewater contains **ammonia**. Ammonia is toxic to aquatic life. Nitrification is a biological process that converts Ammonia to **Nitrate**. There are drinking water MCLs for nitrates. Wastewater treatment plants commonly use nitrification and denitrification processes to remove Ammonia and nitrate from the waste stream. Inadequate or incomplete nitrification or denitrification may result in the discharge of Ammonia or Nitrate to the receiving stream.

The existing Order contains a Receiving Water Limitation for un-ionized Ammonia, that requires that the discharge shall not cause Ammonia in the receiving water to exceed 0.025 mg/l as Nitrogen. The WWTP has had numerous violations of the Receiving Water Limitation. Effluent monitoring results submitted by the Discharger indicate that the concentration of Ammonia in the effluent has exceeded the U.S. EPA Ambient Water Quality Chronic Criteria for Ammonia on numerous occasions. The Code of Federal Regulations, 40 CFR 122.44(d)(iii), states that when a discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above allowable numeric criteria for an individual pollutant, the NPDES permit must contain an Effluent Limitation. Failure to operate the wastewater treatment plant in a nitrification/denitrification mode will result in excessive concentrations of ammonia and nitrate being discharged and degrade the beneficial uses of the receiving stream.

Despite numerous projects over several years, the Discharger has failed to comply with Waste Discharge Requirement limitations and to adequately nitrify the wastewater to achieve compliance with ammonia limitations. The ammonia limitation, and the corresponding compliance monitoring, was established as a Receiving Water Limitation in existing Waste Discharge Requirements, not an Effluent Limitation as is appropriate. The Discharger has purchased water, which has been diverted down the receiving stream in an effort to provide dilution in an attempt to comply with the Receiving Water Limitation for ammonia following failed efforts at achieving adequate nitrification of the wastestream. The Regional Board issued Administrative Civil Liability Order No. 96-086 (ACLO) and Cease and Desist Order No. 96-087 (CDO) in 1996 for violations of previous Waste Discharge Requirements Order No. 92-116. The Discharger was required to pay \$25,000 immediately and an additional \$25,000 should the Discharger

fail to comply with the CDO. A principal component of the water quality problems were due to the ongoing discharge of unacceptably high concentrations of ammonia. The Discharger paid the initial \$25,000 and made improvements to the collection system and treatment facilities. However, the new facilities failed to comply completely with the CDO and permit limitations and prohibitions. The Discharger paid the second \$25,000 on 4 February 2000 and has recently completed additional plant improvements. A Notice of Violation (NOV) was issued on 13 September 2000 for 25 total effluent limitation violations, including 12 ammonia violations. An NOV was issued on 12 July 2001, for the period August 2000 through April 2001, including receiving water ammonia violations on 16 occasions. Between May 2001 and September 2003, there have been additional violations of the Effluent and Receiving Water Limitations and reporting requirements of Order 97-113, including 31 violations of the Receiving Water Limitation for Ammonia. The receiving water ammonia sampling is not capable of providing sufficient information to determine if the most recently completed project will provide nitrification sufficient to comply with the ammonia Effluent Limitation. The Discharger claims the system is now capable of adequately nitrifying the waste stream.

Atrazine - To protect the receiving stream aquatic life beneficial uses, a new concentration-based Effluent Limitation for Atrazine, based on the Ambient Water Quality Criterion, to implement the Basin Plan narrative toxicity objective is included in this Order.

Chlorine is commonly used as a disinfection agent in the treatment of wastewater. The Discharger currently uses Chlorine for disinfection at the WWTP. Inadequate dechlorination may result in the discharge of Chlorine to the receiving stream. Chlorine is a toxic substance. The use of Chlorine as a disinfectant presents a reasonable potential that it could be discharged to the receiving stream in toxic concentrations.

Phthalate acid esters (PAEs) represent a large family of chemicals widely used as plasticizers, primarily in the production of polyvinyl chloride (PVC) resins. PVC resins are used in such diverse industries as construction, home furnishings, transportation, apparel, and food and medical packaging materials. Phthalates also have non-plasticizer uses in pesticide carriers, cosmetics, fragrances, munitions, industrial oils, and insect repellants. The most widely used phthalate plasticizer is Bis(2-ethylhexyl)phthalate. In the monitoring results submitted by the Discharger (see Table 3 of the Information Sheet), the laboratory reported the presence of Bis(2-ethylhexyl)phthalate in two of five samples, at estimated concentrations of 1.7 and 2.93 µg/l, Diethyl phthalate in one of five samples, at a concentration of 4.57 µg/l, and Di-n-butyl phthalate in one of five samples, at an estimated concentration of 1.0 µg/l. The Bis(2-ethylhexyl)phthalate concentration of 2.93 µg/l and the Diethyl phthalate concentration of 4.57 µg/l were detected in the same sample. The sum of the two PAEs exceeds the Chronic Lowest Observed Effect

Level for PAEs of 3 µg/l. The estimated Bis(2-ethylhexyl)phthalate concentration of 2.93 µg/l also exceeds the CTR Criterion of 1.8 µg/l. To protect the aquatic habitat beneficial uses of the receiving waters, a new concentration-based Effluent Limitation for the sum of the PAEs, based on the Ambient Water Quality Criteria for Protection of Freshwater Aquatic Life, U.S. EPA Toxicity Information on the Chronic Lowest Observed Effect Level for PAEs of 3 µg/l (as a 30-Day Average), is included in the proposed Order.

Tributyltin (TBT) in this area is primarily used as a biocide in cooling towers and as an antifouling agent in paints. TBT remains effective over long periods because it is released slowly into the water column over time. To implement the Basin Plan narrative toxicity objective and protect the aquatic beneficial uses of the receiving water, concentration-based Effluent Limitations for Tributyltin, based on the Ambient Water Quality Criteria, are included in the proposed Order.

Alachlor, Nitrate, and Nitrite, and Manganese and MTBE - DHS has adopted Primary Maximum Contaminant Levels (PMCLs) in Title 22 for Alachlor, Nitrate, and Nitrite, and Secondary MCLs for Manganese and MTBE. To implement the Basin Plan Narrative Chemical Constituent Objective and protect the municipal and domestic supply beneficial use of the receiving water, Effluent Limitations for Alachlor, Nitrate, and Nitrite, Manganese and MTBE are included in the proposed Order.

Bis(2-ethylhexyl)phthalate, Bromodichloromethane, Copper, Dioxins and Furans, Lead, PCBs, Silver, and Zinc - The U.S. EPA adopted the NTR and the CTR that contain numerical water quality standards for many wastewater constituents. Additional explanation of the NTR and CTR is provided in Findings above. The SIP, adopted by the State Water Resources Control Board, contains guidance on implementation of the NTR and the CTR. These Rules contain water quality standards applicable to this discharge. Effluent Limitations for Bis(2-ethylhexyl)phthalate, Bromodichloromethane, Copper, Dioxins and Furans, Lead, PCBs, Silver, and Zinc based on the NTR and CTR.

Chloroform - Effluent monitoring results submitted by the Discharger (see Table 2 of the Information Sheet) indicated the presence of Chloroform, in eleven of twelve samples, at concentrations of 3.5, 5.6, 5.8, 5.9, 6.5, 8.0, 8.4, 9.2, 9.7, 11, and again at 11 µg/l.

By applying standard toxicological assumptions used by OEHHA and U.S. EPA in evaluating health risks via drinking water exposure of 70 kg body weight and 2 liters per day water consumption, this cancer potency factor is equivalent to a concentration in drinking water of 1.1 µg/l (0.0011 mg/l) at the 1-in-a-million cancer risk level. This risk level is consistent with that used by the Department of Health Services (DHS) to set

de minimis risks from involuntary exposure to carcinogens in drinking water in developing MCLs and Action Levels and by OEHHA to set negligible cancer risks in developing Public Health Goals for drinking water.

Mass-based final Effluent Limitations, in lbs/day, are also included in the proposed Order, where practicable, in accordance with the Code of Federal Regulations, 40 CFR 122.45(f). The Discharger must calculate the mass limits using the concentration-based Effluent Limits calculated as described in the Information Sheet and according to the design dry weather flow.

Objectives/Study - EC And TDS

Agriculture irrigation is a beneficial use of the receiving waters, Rock Creek, Dry Creek, and downstream waters. Domestic and industrial use of water, results in an increase in the mineral content of the wastewater. The minerals include calcium, sodium, sulfate, and other dissolved salts, including chloride. The salinity of wastewater is determined by measuring EC or TDS, which are parameters used to determine the suitability of wastewater for irrigation. Monitoring results submitted by the Discharger indicated that concentrations of Electrical Conductivity (EC) and Total Dissolved Solids (TDS) exceeded Agriculture Irrigation Goals in the effluent. However, no data was submitted by the Discharger to indicate the Agriculture Irrigation Objectives were exceeded in the Receiving Water. This Order contains a Provision for a study to determine whether the discharge causes the EC and TDS to exceed the Agriculture Irrigation Goals in the Receiving Water. The Provision allows this Order to be reopened if new data indicate Effluent Limitations are necessary.

Collection System

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. Conveyance 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/conveyance facilities.

Sanitary sewer overflows consist of varying mixtures of domestic sewage, industrial wastewater, and commercial wastewater. This mixture depends on the pattern of land use in the sewage collection system tributary to the overflow. The chief causes of sanitary

sewer overflows include lack of maintenance, blockages due to grease, roots, and debris, sewer line flood damage, manhole structure failures, vandalism, pump station mechanical failures, power outages, storm water or groundwater inflow/infiltration, insufficient capacity, and contractor caused blockages.

Sanitary sewer overflows often contain high levels of suspended solids, pathogenic organisms, toxic pollutants, nutrients, oxygen demanding organic compounds, oil and grease, and other pollutants. Sanitary sewer overflows can cause exceedance of applicable water quality objectives, pose a threat to public health, adversely affect aquatic life, and impair the public recreational use and aesthetic enjoyment of surface waters in the area.

The Discharger is responsible for all necessary steps to adequately maintain and operate its sanitary sewer collection system.

Pretreatment

U.S. EPA Region IX staff conducted inspections, of significant industrial users (SIUs) and metal finishing operations within the Placer County Sewer Management District No. 1 sewer service area, in May 2003. As a result of those inspections, Carpenter Advanced Ceramics and Sierra Plating were issued Findings of Violation and Administrative Orders CWA-307-9-03-023 (Carpenter Advanced Ceramics) and CWA-307-9-03-024 (Sierra Plating), and Coherent Auburn Division was issued a Request for Information and Self-Monitoring Order CWA-308-9-04-001. Other industries that may discharge constituents of concern are located within the Discharger's service area. The proposed Order includes a Provision requiring the Discharger to develop technically based local limits for industries and an Industrial Pretreatment Program within a year of adoption.