

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2002-0050

NPDES NO. CA0079901

WASTE DISCHARGE REQUIREMENTS
FOR
CITY OF NEVADA CITY
WASTEWATER TREATMENT PLANT
NEVADA COUNTY

The California Regional Water Quality Control Board, Central Valley Region, (hereafter Regional Board) finds that:

BACKGROUND

1. The City of Nevada City (hereafter Discharger) submitted a Report of Waste Discharge, dated 29 November 2000, and applied for a permit renewal to discharge waste under the National Pollutant Discharge Elimination System (NPDES) from the Discharger's domestic Wastewater Treatment Plant (WWTP).
2. The Discharger owns and operates a wastewater collection, treatment, and disposal system, and provides sewerage service to the City of Nevada City with a population of approximately 3,000. The treatment plant is in Section 12, T16N, R8E, MDB&M, as shown on Attachment A, a part of this Order. Treated municipal wastewater is discharged to Deer Creek, a water of the United States and tributary to the Yuba River at the point, latitude 39° 15' 35.1" and longitude 121° 01' 50.7".
3. The treatment system consists of grit removal, comminution, biological treatment in sequencing batch reactors, sand filtration, pH adjustment, and chlorination/dechlorination. Sludge is treated in an aerobic digester, dewatered, and disposed off-site.
4. The Report of Waste Discharge describes the wastewater discharge as follows:

Design Flow Rate (average dry weather flow)	0.69	million gallons per day (mgd)
Average Daily Flow Rate	0.43	mgd
Maximum Daily Flow Rate	1.60	mgd
Average Temperature, Summer	72	°F
Average Temperature, Winter	51	°F
Average Daily Biochemical Oxygen Demand (BOD) ¹	4	mg/l
Maximum Daily BOD	14	mg/l
Average Daily Total Suspended Solids (TSS)	3	mg/l
Maximum Daily TSS	29	mg/l

¹ 5-day, 20°C biochemical oxygen demand

5. The Regional Board adopted a *Water Quality Control Plan, Fourth Edition, for the Sacramento and San Joaquin River Basins* (hereafter Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve water quality objectives for all waters of the Basin. These requirements implement the Basin Plan.
6. The United States Environmental Protection Agency (U.S. EPA) adopted the *National Toxics Rule* (NTR) on 5 February 1993 and the *California Toxics Rule* (CTR) on 18 May 2000. These Rules contain water quality standards applicable to this discharge. The State Water Resources Control Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (known as the *State Implementation Plan* or SIP), which contains guidance on implementation of the NTR and the CTR.

BENEFICIAL USES OF THE RECEIVING STREAM

7. The Basin Plan states, on page II-1.00, "*Protection and enhancement of existing and potential beneficial uses are primary goals of water quality planning...*" and "*disposal of wastewaters is [not] a prohibited use of waters of the state; it is merely a use which cannot be satisfied to the detriment of beneficial uses.*" The existing and beneficial uses that currently apply to surface waters of the basins are presented in Figure II-1 and Table II-1 of the Basin Plan. The beneficial uses of any specifically identified water body apply to its tributary streams. It should be noted that it is impractical to list every surface water body in the Region. For unidentified water bodies, the beneficial uses will be established by the tributary rule. Deer Creek is in the Yuba River, Englebright Dam to Feather River hydrologic area (515.3) in the Sacramento Hydrologic Basin. The beneficial uses of Deer Creek are not specifically identified in the Basin Plan. Deer Creek is tributary to the Yuba River below Englebright Dam. The Yuba River is the first body of water downstream of Deer Creek for which the Basin Plan has identified existing and potential beneficial uses. The beneficial uses of the Yuba River below Englebright Dam, as identified in Table II-1 of the Basin Plan, are agricultural irrigation, agricultural stock watering, hydropower generation, body contact water recreation, non-contact water recreation, warm freshwater aquatic habitat, cold freshwater aquatic habitat, warm fish migration habitat, cold fish migration habitat, warm spawning habitat, cold spawning habitat, and wildlife habitat. Other beneficial uses identified in the Basin Plan apply to Deer Creek, including groundwater recharge and freshwater replenishment. Upon review of the flow conditions, habitat values, and beneficial uses of Deer Creek, the Regional Board finds that the beneficial uses identified in the Basin Plan for the Yuba River below Englebright Dam, are applicable to Deer Creek.
8. The Basin Plan states that "*Water Bodies within the basins that do not have beneficial uses designated in Table II-1 are assigned MUN designations in accordance with the provisions of State Water Board Resolution No. 88-63 which is, by reference, a part of this Basin Plan.*" State Water Resources Control Board Resolution No. 88-63 "Sources of Drinking Water" provides that "*All surface and ground waters of the State are considered to be suitable, or potentially suitable, for municipal or domestic water supply and should be so designated by the Regional Boards...*". The beneficial use of municipal and domestic supply is applicable to Deer Creek based on Resolution 88-63, the Basin Plan tributary rule, and actual uses.

9. The Regional Board finds that the beneficial uses identified in the Basin Plan for the Yuba River below Englebright Dam are applicable to Deer Creek based upon the following:

a. *Municipal and Domestic Supply*

The State Water Resources Control Board (SWRCB) has recorded water rights for domestic uses, irrigation uses, recreational uses, and fish and wildlife protection and/or enhancement along Deer Creek downstream of the discharge. Riparian rights, for landowners along streams and rivers, may not be recorded with the SWRCB.

Deer Creek is a low-flow stream and may provide groundwater recharge during periods of low flow. Groundwater is a designated source of drinking and irrigation water.

b. *Water Contact and Noncontact Recreation (including canoeing, rafting, and aesthetic enjoyment)*

Downstream of the discharge, land adjacent to Deer Creek is zoned primarily for low-density housing. There are significant public access locations to Deer Creek including roads, pathways, and hiking trails. Undiverted water from Deer Creek flows into Lake Wildwood, a manmade reservoir, which is surrounded by the community of Lake Wildwood. Lake Wildwood is used for body-contact water recreational uses. The uses of Lake Wildwood are equivalent to those in a nonrestricted recreational impoundment, as defined in the California Code of Regulations, Title 22 Reclamation Criteria. The reservoir may concentrate wastewater constituents, as water evaporates and percolates, prior to being discharged downstream to the lower reaches of Deer Creek and into the Yuba River. The lower reaches of Deer Creek and the Yuba River also provide opportunities for recreational activities.

c. *Warm and Cold Freshwater Habitats (including preservation or enhancement of fish and invertebrates) and Wildlife Habitat*

Deer Creek flows to the Yuba River. The Basin Plan (Table II-1) designates the Yuba River as being both a cold and warm freshwater habitat. Pursuant to the Basin Plan tributary rule, the warm and cold freshwater habitat designations applied to the Yuba River also apply to Deer Creek. The cold-water habitat designation for Deer Creek is appropriate since the California Department of Fish and Game has recorded the presence of trout in these waters. The cold freshwater habitat designation necessitates that the in-stream dissolved oxygen concentration be maintained at, or above, 7.0 mg/l.

d. *Groundwater Recharge*

In areas where groundwater elevations are below the stream bottom, water from the stream will percolate to groundwater. During dry weather in many places in California, flowing streams experience these conditions, thus providing groundwater recharge. Groundwater provides a source of municipal and irrigation water supply.

e. *Freshwater Replenishment*

When water is present in Deer Creek, there is hydraulic continuity between these waters and the Yuba River. Deer Creek contributes to the quantity and impacts the quality of the water in the Yuba River.

The Regional Board also finds that, based on the available information and on the Discharger's application, that Deer Creek, absent the discharge from the wastewater treatment plant, is a low-flow stream. The low-flow nature of Deer Creek and the lack of receiving water quality data mean that the designated beneficial uses must be protected, but that no credit for receiving water assimilative capacity is available. Although the discharge, at times, maintains the aquatic habitat, constituents may not be discharged that may cause harm to aquatic life. Flows within Deer Creek help support cold-water aquatic life. The lack of significant dilution results in more stringent effluent limitations to protect contact recreational uses and aquatic life and to meet municipal and agricultural water quality goals.

EFFLUENT LIMITATIONS AND REASONABLE POTENTIAL

10. 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.
11. Federal regulations require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause or contribute to an in-stream excursion above a narrative or numerical water quality standard. This Order contains provisions that:
 - a. require the Discharger to provide information as to whether the levels of CTR, NTR, and U.S. EPA priority toxic pollutants in the discharge cause or contribute to an in-stream excursion above a water quality objective;
 - b. if the discharge has a reasonable potential to cause or contribute to an in-stream excursion above a water quality objective, require the Discharger to submit information to calculate effluent limitations for those constituents; and
 - c. allow the Regional Board to reopen this Order and include effluent limitations for those constituents.

On 10 September 2001, the Executive Officer issued a letter, in conformance with State Water Code, Section 13267, requiring the Discharger to prepare a technical report assessing water quality. This Order is intended to be consistent with the requirements of the technical report in requiring sampling for NTR, CTR, and additional constituents to determine the full water quality impacts of the discharge. The technical report requirements are intended to be more detailed, listing specific

constituents, detection levels, and acceptable time frames and shall take precedence in resolving any conflicts.

12. Section 13263.6(a), California Water Code, requires that "the regional 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 United States Code Section 11023) (EPCRA) indicate as discharged into the POTW, for which the state board or the regional board has established numerical 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". There is insufficient information to determine if pollutants in the effluent other than those limited by this Order have the reasonable potential to cause, or contribute to, an excursion above any numeric water quality objective. The study described in the above Finding will determine if additional effluent limitations are necessary.
13. Federal regulations require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause, or contribute to an in-stream excursion above a narrative or numerical water quality standard. Based on information submitted as part of the application, in studies, and as directed by monitoring and reporting programs, the Regional Board finds that the discharge does have a reasonable potential to cause or contribute to an in-stream excursion above water quality objectives for ammonia, chlorine, nitrate plus nitrite, and nitrite. Effluent limitations for these constituents are included in this Order.
14. The Basin Plan prohibits the discharge of toxic materials in toxic concentrations. The Discharger uses chlorine for disinfection of the effluent waste stream. Chlorine can cause toxicity to aquatic organisms when discharged to surface waters. U.S. EPA recommends, in its Ambient Water Quality Criteria for the Protection of Fresh Water Aquatic Life, maximum 1-hour average and 4-day average chlorine concentrations. The use of chlorine as a disinfectant presents a reasonable potential that it could be discharged in toxic concentrations. Effluent Limitations for chlorine have been included in this Order to protect the receiving stream aquatic life beneficial uses. The effluent limitations have been established at the ambient water quality criteria for chlorine since Deer Creek is a low-flow stream.
15. 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 nitrogen gas, which is then released to the atmosphere. Wastewater treatment plants commonly use 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. The Basin Plan prohibits the discharge of toxic materials in toxic concentrations. Nitrate and nitrate are known to cause adverse health effects in humans. The Basin Plan prohibits the discharge of chemical constituents in concentrations that adversely affect beneficial uses. Domestic water supply is a beneficial use of Deer Creek. U.S. EPA has developed Drinking Water Standards for protection of human health for nitrite and nitrate

and Ambient Water Quality Criteria for ammonia. The discharge from the Nevada City Wastewater Treatment Plant has a reasonable potential to cause or contribute to an in-stream excursion above water quality standards for ammonia, nitrite, and nitrate. Effluent limitations for ammonia, nitrite, and nitrate are included in this Order to assure the treatment process adequately nitrifies and denitrifies the waste stream to protect the beneficial uses of the receiving stream and to prevent aquatic toxicity.

16. The beneficial uses of Deer Creek and the Yuba River include contact recreation uses and irrigation. 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 may be classified into three broad groups: bacteria, parasites, and viruses. Tertiary treatment, consisting of chemical coagulation, sedimentation, and filtration, has been found to remove approximately 99.5% of viruses. Filtration is an effective means of reducing viruses and parasites from the waste stream. The wastewater must be treated to tertiary standards (filtered) to protect contact recreational and food crop irrigation uses.

The California Department of Health Services (DHS) has developed reclamation criteria, California Code of Regulations, Title 22, Division 4, Chapter 3 (Title 22), for the reuse of wastewater. Title 22 requires that for spray irrigation of food crops, parks, playgrounds, schoolyards, and other areas of similar public access, wastewater be adequately disinfected, oxidized, coagulated, clarified, and filtered, and that the effluent total coliform levels not exceed 2.2 MPN/100 ml as a 7-day median. Title 22 also requires that recycled water used as a source of water supply for nonrestricted recreational impoundments be disinfected tertiary recycled water that has been subjected to conventional treatment. A nonrestricted recreational impoundment is defined as "...an impoundment of recycled water, in which no limitations are imposed on body-contact water recreational activities." Title 22 is not directly applicable to surface waters; however, the Regional Board finds that it is appropriate to apply an equivalent level of treatment to that required by DHS's reclamation criteria because Deer Creek, Lake Wildwood, and the Yuba River are used for irrigation of agricultural land and for contact recreation purposes. The stringent disinfection criteria of Title 22 are appropriate since the undiluted effluent may be used for the irrigation of food crops and/or for body-contact water recreation. Coliform organisms are intended as an indicator of the effectiveness of the entire treatment train and the effectiveness of removing other pathogens. The method of treatment is not prescribed by this Order; however, wastewater must be treated to a level equivalent to that recommended by DHS.

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

The wastewater treatment plant currently provides filtration without prior coagulation as part of the wastewater treatment process. The addition of coagulation, with any necessary filter improvements, to the secondary treatment process would effectively remove pathogens and result in the ability to achieve lower levels for total coliform organisms, BOD, TSS, and turbidity than the standards currently prescribed. The current NPDES permit contains effluent limitations that are equivalent to tertiary, except that the total coliform organisms limitation of 2.2 MPN/100 ml is expressed as a monthly median rather than the 7-day median currently recommended by DHS; the average daily BOD and TSS limitations are 30 mg/l instead of the 20 mg/l that is technically achievable by a tertiary treatment system; and there are no turbidity limitations. The total coliform organisms, BOD, TSS, and turbidity limitations have been revised to reflect current tertiary treatment standards. The WWTP filter design may not provide an equivalent-to-tertiary treatment, as recommended by DHS, for pathogen removal. A schedule is included in this permit to allow the Discharger time to plan, design, and construct facilities necessary to meet an equivalent-to-tertiary treatment, as defined by DHS, and comply with the revised effluent total coliform organisms, BOD, TSS, and turbidity limitations.

GROUNDWATER

17. The beneficial uses of the underlying ground water, as identified in the Basin Plan, are municipal and domestic supply, industrial service supply, industrial process supply, and agricultural supply.
18. All processes are contained in concrete basins. There is no reasonable potential for pollutants to migrate to groundwater. This Order contains a Limitation requiring no degradation of groundwater.

GENERAL

19. Monitoring is required by this Order for the purposes of assessing compliance with permit limitations and water quality objectives and gathering information to evaluate the need for additional limitations.
20. Monitoring and Reporting Program No. R5-2002-0050, Attachments A through D, and the Fact Sheet, are a part of this Order.
21. This discharge was previously regulated by Waste Discharge Requirements in Order No. 96-103, adopted by the Regional Board on 3 May 1996.
22. U.S. EPA and the Regional Board have classified this discharge as a minor discharge.
23. The permitted discharge is consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Resources Control Board Resolution 68-16. Compliance with these requirements will result in the use of best practicable treatment or control of the discharge. The impact on existing water quality will be insignificant.

24. The action to adopt an NPDES permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code Section 21000, *et seq.*), requiring preparation of an environmental impact report or negative declaration in accordance with Section 13389 of the California Water Code.
25. The Regional Board has considered the information in the attached Fact Sheet in developing the Findings of this Order. The attached Fact Sheet is part of this Order.
26. The Regional Board has notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for this discharge and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.
27. The Regional Board, in a public meeting, heard and considered all comments pertaining to the discharge.
28. This Order shall serve as an NPDES permit pursuant to Section 402 of the CWA, and amendments thereto, and shall take effect upon the date of hearing, provided U.S. EPA has no objections.

IT IS HEREBY ORDERED that Order No. 96-103 is rescinded and the City of Nevada City, its agents, successors and assigns, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, and the provisions of the Clean Water Act and regulations and guidelines adopted thereunder, shall comply with the following:

A. Discharge Prohibitions:

1. Discharge of wastewater at a location or in a manner different from that described in the Findings is prohibited.
2. The by-pass or overflow of wastes to surface waters is prohibited, except as allowed by Standard Provision A.13. [See attached "Standard Provisions and Reporting Requirements for Waste Discharge Requirements (NPDES)"].
3. Neither the discharge nor its treatment shall create a nuisance as defined in Section 13050 of the California Water Code.

B. Effluent Limitations:

1. Effluent shall not exceed the following limitations (from adoption until **31 March 2007**):

<u>Constituents</u>	<u>Units</u>	<u>Average Monthly</u>	<u>Median Monthly</u>	<u>Average Weekly</u>	<u>Average Daily</u>	<u>Instantaneous Maximum</u>
BOD ₅ ¹	mg/l	10 ²	--	15 ²	30 ²	--
	lbs/day ³	58	--	86	170	--
Total Suspended Solids	mg/l	10 ²	--	15 ²	30 ²	--
	lbs/day ³	58	--	86	170	--
Settleable Solids	m/l/l	0.1	--	--	0.2	--
Total Coliform Organisms	MPN/100 ml	--	2.2	--	--	23

¹ 5-day, 20°C biochemical oxygen demand (BOD)

² To be ascertained by a 24-hour composite

³ Based upon a design treatment capacity of 0.69 mgd ($x \text{ mg/l} \times 8.345 \times 0.69 \text{ mgd} = y \text{ lbs/day}$)

<u>Constituents</u>	<u>Units</u>	<u>Average Monthly</u>	<u>Average 4-Day</u>	<u>Average 1-Hour</u>
Total Residual Chlorine	mg/l lbs/day ¹	0.010 0.057	-- --	0.019 0.110
Ammonia (as N)	mg/l lbs/day ¹	Attachment B ²	Attachment C ²	Attachment D
Nitrite (as N)	mg/l lbs/day ¹	1 5.8	-- --	-- --
Nitrate + Nitrite (as N)	mg/l lbs/day ¹	10 58	-- --	-- --

¹ Based upon a design treatment capacity of 0.69 mgd ($x \text{ mg/l} \times 8.345 \times 0.69 \text{ mgd} = y \text{ lbs/day}$)

² The mass limit (lb/day) for ammonia shall be equal to the concentration limit (from Attachments) multiplied by the design flow of 0.69 mgd and the unit conversion factor of 8.345 (see footnote 1 for equation).

2. The effluent shall not exceed the following limitations (from **1 April 2007** forward):

<u>Constituents</u>	<u>Units</u>	<u>Average Monthly</u>	<u>Average Weekly</u>	<u>7-Day Median</u>	<u>Average Daily</u>	<u>Instantaneous Maximum</u>
BOD ₅ ¹	mg/l	10 ²	15 ²	--	20 ²	--
	lbs/day ³	58	86	--	115	--

¹ 5-day, 20°C biochemical oxygen demand (BOD)

² To be ascertained by a 24-hour composite

³ Based upon a design treatment capacity of 0.69 mgd ($x \text{ mg/l} \times 8.345 \times 0.69 \text{ mgd} = y \text{ lbs/day}$)

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<u>Constituents</u>	<u>Units</u>	<u>Average Monthly</u>	<u>Average Weekly</u>	<u>7-Day Median</u>	<u>Average Daily</u>	<u>Instantaneous Maximum</u>
Total Suspended Solids	mg/l	10 ²	15 ²	--	20 ²	--
Settleable Solids	lbs/day ³	58	86	--	115	--
Total Coliform Organisms	m//l	0.1	--	--	0.2	--
Turbidity	MPN/100 ml	--	--	2.2	--	23 ⁴
	NTU	--	--	--	2	5 ⁵

⁴ The total coliform organisms concentration shall not exceed 23 MPN/100 ml more than once in any 30-day period. No sample shall exceed a concentration of 240 MPN/100 ml.

⁵ The turbidity shall not exceed 5 NTU more than 5 percent of the time within a 24-hour period. At no time shall the turbidity exceed 10 NTU.

<u>Constituents</u>	<u>Units</u>	<u>Average Monthly</u>	<u>Average 4-Day</u>	<u>Average 1-Hour</u>
Total Residual Chlorine	mg/l	0.010	--	0.019
Ammonia (as N)	lbs/day ¹	0.057	--	--
Nitrite (as N)	mg/l	Attachment B	Attachment C	Attachment D
	lbs/day ¹	²	²	--
Nitrate + Nitrite (as N)	mg/l	1	--	--
	lbs/day ¹	5.8	--	--
	mg/l	10	--	--
	lbs/day ¹	58	--	--

¹ Based upon a design treatment capacity of 0.69 mgd (x mg/l x 8.345 x 0.69 mgd = y lbs/day)

² The mass limit (lb/day) for ammonia shall be equal to the concentration limit (from Attachments) multiplied by the design flow of 0.69 mgd and the unit conversion factor of 8.345 (see footnote 1 for equation).

- The arithmetic mean of 20°C BOD (5-day) and of total suspended solids in effluent samples collected over a calendar month shall not exceed 5 percent of the arithmetic mean of the values for influent samples collected at approximately the same times during the same period (95 percent removal).
- The discharge shall not have a pH less than 6.5 nor greater than 8.5.
- The average dry weather discharge flow shall not exceed 0.69 million gallons.
- Survival of aquatic organisms in 96-hour bioassays of undiluted waste shall be no less than:

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

C. Sludge Disposal:

1. Collected screenings, sludges, and other solids removed from liquid wastes shall be disposed of in a manner approved by the Executive Officer, and consistent with *Consolidated Regulations for Treatment, Storage, Processing, or Disposal of Solid Waste*, as set forth in California Code of Regulations, Title 27, Division 2, Subdivision 1, Section 20005, *et seq.*
2. Any proposed change in sludge use or disposal practice from a previously approved practice shall be reported to the Executive Officer and U.S. EPA Regional Administrator at least **90 days** in advance of the change.
3. Use and disposal of sewage sludge shall comply with existing Federal and State laws and regulations, including permitting requirements and technical standards included in 40 CFR 503.
4. If the State Water Resources Control Board and the Regional Water Quality Control Boards are given the authority to implement regulations contained in 40 CFR 503, this Order may be reopened to incorporate appropriate time schedules and technical standards. The Discharger must comply with the standards and time schedules contained in 40 CFR 503 whether or not they have been incorporated into this Order.
5. The Discharger is encouraged to comply with the "Manual of Good Practice for Agricultural Land Application of Biosolids" developed by the California Water Environment Association.

D. Receiving Water Limitations:

Receiving Water Limitations are based upon water quality objectives contained in the Basin Plan. As such, they are a required part of this permit.

The discharge shall not cause the following in Deer Creek or downstream waters:

1. The fecal coliform concentration, based on a minimum of not less than five samples for any 30-day period, to exceed a geometric mean of 200 MPN/100 ml or cause more than 10 percent of total samples taken during any 30-day period to exceed 400 MPN/100 ml.
2. Biostimulatory substances which promote aquatic growths in concentrations that cause nuisance or adversely affect beneficial uses.
3. Esthetically undesirable discoloration.
4. Concentrations of dissolved oxygen to fall below 7.0 mg/l. The monthly median of the mean daily dissolved oxygen concentration shall not be caused to fall below 85 percent of saturation in the main water mass, and the 95th percentile concentration shall not be caused to fall below 75 percent of saturation.

5. Floating material to be present in amounts that cause nuisance or adversely affect beneficial uses.
6. Oils, greases, waxes, or other materials to accumulate in concentrations that cause nuisance, result in a visible film or coating on the water surface or on objects in the water, or otherwise adversely affect beneficial uses.
7. The ambient pH to fall below 6.5, exceed 8.5, or change by more than 0.5 units. An one-month averaging period may be applied when calculating the pH change of 0.5 units.
8. Radionuclides to be present in concentrations that harm human, plant, animal or aquatic life; or that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life.
9. Deposition of material that causes nuisance or adversely affects beneficial uses.
10. Taste- or odor-producing substances to impart undesirable tastes or odors to fish flesh or other edible products of aquatic origin or to cause nuisance or adversely affect beneficial uses.
11. The ambient temperature to increase more than 5°F.
12. Toxic pollutants to be present in the water column, sediments, or biota in concentrations that adversely affect beneficial uses; that produce detrimental response in human, plant, animal, or aquatic life; or that bioaccumulate in aquatic resources at levels which are harmful to human health.
13. The turbidity to increase as follows:
 - a. More than 1 Nephelometric Turbidity Units (NTUs) where natural turbidity is between 0 and 5 NTUs.
 - b. More than 20 percent where natural turbidity is between 5 and 50 NTUs.
 - c. More than 10 NTUs where natural turbidity is between 50 and 100 NTUs.
 - d. More than 10 percent where natural turbidity is greater than 100 NTUs.
14. When wastewater is treated to a tertiary level (including coagulation) or equivalent, a one-month averaging period may be used when determining compliance with Receiving Water Limitation 13.a.

15. Aquatic communities and populations, including vertebrate, invertebrate, and plant species, to be degraded.
16. Upon adoption of any applicable water quality standard for receiving waters by the Regional Board or the State Water Resources Control Board pursuant to the CWA and regulations adopted thereunder, this permit may be reopened and receiving water limitations added.

E. Groundwater Limitation:

1. The discharge shall not cause the underlying groundwater to be degraded.

F. Provisions:

1. The treatment facilities shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency.
2. The Discharger shall not allow pollutant-free wastewater to be discharged into the collection, treatment, and disposal system in amounts that significantly diminish the system's capability to comply with this Order. Pollutant-free wastewater means rainfall, groundwater, and condensates that are essentially free of pollutants.
3. There are indications that the discharge may contain constituents that have a reasonable potential to cause or contribute to an exceedance of water quality objectives. The constituents are specifically listed in a technical report requirement issued by the Executive Officer on 10 September 2001 and include NTR, CTR, and additional constituents, which could exceed Basin Plan numeric or narrative water quality objectives. The Discharger shall comply with the following time schedule in conducting a study of the potential effect(s) of these constituents in surface waters:

<u>Task</u>	<u>Compliance Date</u>
Submit Study Report	1 March 2003
Submit Study Report for dioxins	1 March 2004

This Order is intended to be consistent with the requirements of the 10 September 2001 technical report. The technical report requirements shall take precedence in resolving any conflicts. The Discharger shall submit to the Regional Board on or before each compliance due date, the specified document or a written report detailing compliance or noncompliance with the specific date and task. If noncompliance is reported, the Discharger shall state the reasons for noncompliance and include an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Regional Board by letter when it returns to compliance with the time schedule.

On or before each compliance date, the Discharger shall submit to the Regional Board the specified document or a written report detailing compliance or noncompliance with the specific date and task. If noncompliance is reported, the Discharger shall state the reasons for noncompliance and include an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Regional Board by letter when it returns to compliance with the time schedule.

If, after review of the study results, it is determined that the discharge has reasonable potential to cause or contribute to an exceedance of a water quality objective, this Order may be reopened and effluent limitations added for the subject constituents.

4. The Discharger shall conduct the chronic toxicity testing specified in the Monitoring and Reporting Program. If the testing indicates that the discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above the water quality objective for toxicity, the Discharger shall initiate a Toxicity Identification Evaluation (TIE) to identify the causes of toxicity. Upon completion of the TIE, the Discharger shall submit a workplan to conduct a Toxicity Reduction Evaluation (TRE) and, after Regional Board evaluation, conduct the TRE. This Order may be reopened and a chronic toxicity limitation included and/or a limitation for the specific toxicant identified in the TRE included. Additionally, if a chronic toxicity water quality objective is adopted by the State Water Resources Control Board, this Order may be reopened and a limitation based on that objective included.
5. The Discharger shall comply with the following time schedule to assure compliance with the tertiary treatment requirements and associated Effluent Limitations of this Order:

<u>Task</u>	<u>Compliance Date</u>	<u>Report Due Date</u>
Submit Annual Status Report		1 April, annually
Submit Workplan ¹ /Time Schedule		31 January 2003
Full Compliance	1 April 2007	

¹ The workplan shall include a hydraulic analysis of the treatment system components.

The Discharger shall submit to the Regional Board on or before each compliance and report due date, the specified document or, if appropriate, a written report detailing compliance or noncompliance with the specific schedule date and task. If noncompliance is being reported, the reasons for such noncompliance shall be stated; the report shall also include an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Regional Board by letter when it returns to compliance with the time schedule.

6. The Discharger shall use the best practicable treatment or control technique currently available to limit mineralization to no more than a reasonable increment.

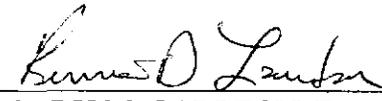
7. The Discharger shall report to the Regional Board any toxic chemical release data it reports to the State Emergency Response Commission within 15 days of reporting the data to the Commission pursuant to section 313 of the "Emergency Planning and Community Right to Know Act of 1986".
8. The Discharger shall comply with all the items of the "Standard Provisions and Reporting Requirements for Waste Discharge Requirements (NPDES)", dated 1 March 1991, which are part of this Order. This attachment and its individual paragraphs are referred to as "Standard Provisions".
9. The Discharger shall comply with Monitoring and Reporting Program No. R5-2002-0050, which is part of this Order, and any revisions thereto as ordered by the Executive Officer.
10. When requested by U.S. EPA, the Discharger shall complete and submit Discharge Monitoring Reports. The submittal date shall be no later than the submittal date specified in the Monitoring and Reporting Program for discharger self-monitoring reports.
11. Minimum detection levels for monitoring required by this Order shall, unless impracticable, be adequate to demonstrate compliance with permit limitations.
12. This Order expires on **1 April 2007** and the Discharger must file a Report of Waste Discharge in accordance with California Code of Regulations, Title 23, not later than **180 days in advance** of such date in application for renewal of waste discharge requirements if it wishes to continue the discharge.
13. The Discharger shall implement the necessary legal authorities, programs, and controls to ensure that the following incompatible wastes are not introduced to the treatment system, where incompatible wastes are:
 - a. Wastes that create a fire or explosion hazard in the treatment works;
 - b. Wastes which will cause corrosive structural damage to treatment works, but in no case wastes with a pH lower than 5.0, unless the works is specially designed to accommodate such wastes;
 - c. Solid or viscous wastes in amounts which cause obstruction to flow in sewers, or which cause other interference with proper operation or treatment works;
 - d. Any waste, including oxygen demanding pollutants (BOD, *etc.*), released in such volume or strength as to cause inhibition or disruption in the treatment works, and subsequent treatment process upset and loss of treatment efficiency;

- e. Heat in amounts that inhibit or disrupt biological activity in the treatment works, or that raise influent temperatures above 40°C (104°F), unless the Regional Board approves alternate temperature limits;
 - f. Petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through;
 - g. Pollutants which result in the presence of toxic gases, vapors, or fumes within the treatment works in a quantity that may cause acute worker health and safety problems; and
 - h. Any trucked or hauled pollutants, except at points predesignated by the Discharger.
14. The Discharger shall implement the legal authorities, programs, and controls necessary to ensure that indirect discharges do not introduce pollutants into the sewerage system that, either alone or in conjunction with a discharge or discharges from other sources:
- a. Flow through the system to the receiving water in quantities or concentrations that cause a violation of this Order, or
 - b. Inhibit or disrupt treatment processes, treatment system operations, or sludge processes, or cause a violation of this Order, or
 - c. Prevent sludge use or disposal in accordance with this Order.
15. Prior to making any change in the discharge point, place of use, or purpose of use of the wastewater, the Discharger shall obtain approval of, or clearance from, the State Water Resources Control Board (Division of Water Rights).
16. In the event of any change in control or ownership of land or waste discharge facilities presently owned or controlled by the Discharger, the Discharger shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to this office.

To assume operation under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the requesting entity's full legal name, the State of incorporation if a corporation, address and telephone number of the persons responsible for contact with the Regional Board and a statement. The statement shall comply with the signatory paragraph of Standard Provision D.6 and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code. Transfer shall be approved or disapproved in writing by the Executive Officer.

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2002-0050
CITY OF NEVADA CITY
WASTEWATER TREATMENT PLANT
NEVADA COUNTY

I, GARY M. CARLTON, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 26 April 2002.

for 

GARY M. CARLTON, Executive Officer

Amended

MRH/mrh

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2002-0050

NPDES NO. CA0079901

FOR

CITY OF NEVADA CITY
WASTEWATER TREATMENT PLANT
NEVADA COUNTY

This Monitoring and Reporting Program is issued pursuant to Water Code Section 13267. The Discharger shall not implement any changes to this Program unless and until the Regional Board or Executive Officer issues a revised Monitoring and Reporting Program. Specific sample station locations shall be established under direction of the Regional Board's staff, and a description of the stations shall be attached to this Order.

INFLUENT MONITORING

Samples shall be collected at approximately the same time as effluent samples and should be representative of the influent for the period sampled. Influent monitoring shall include at least the following:

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>
20°C BOD ₅	mg/l, lbs/day	24-hr. Composite ¹	Twice Weekly
Total Suspended Solids	mg/l, lbs/day	24-hr. Composite ¹	Twice Weekly
Flow	mgd	Meter	Continuous

¹ The BOD and TSS samples shall be flow proportional composite samples.

EFFLUENT MONITORING

Effluent samples shall be collected downstream from the last connection through which wastes can be admitted into the outfall, following the last unit process. Effluent samples should be representative of the volume and quality of the discharge. Time of collection of samples shall be recorded. Effluent monitoring shall include at least the following:

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>
Flow	mgd	Meter	Continuous
Total Residual Chlorine	mg/l, lbs/day	Meter	Continuous
Turbidity	NTU	Grab	Continuous ¹

¹ A continuous turbidity monitoring system, or functional equivalent, shall be operational no later than 1 April 2007. Until that time, grab samples shall be collected and analyzed weekly.

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>
pH	Number	Meter	Continuous
Temperature	°F	Grab	Daily
Total Coliform Organisms ²	MPN/100 ml	Grab	3 Times Weekly ³
Ammonia ^{4, 5, 6, 7}	mg/l, lbs/day (as N)	Grab	Twice Weekly
20°C BOD ₅	mg/l, lbs/day	24-hr. Composite ⁸	Twice Weekly
Total Suspended Solids	mg/l, lbs/day	24-hr. Composite ⁸	Twice Weekly
Settleable Solids	ml/l	24-hr. Composite ⁸	Twice Weekly
Electrical Conductivity @ 25°C	µmhos/cm	Grab	Weekly
Nitrite ⁹	mg/l, lbs/day (as N)	Grab	Weekly
Nitrate	mg/l, lbs/day (as N)	Grab	Twice Monthly
Hardness	mg/l (as CaCO ₃)	Grab	Monthly
Total Dissolved Solids	mg/l	Grab	Quarterly
Acute Toxicity ^{10, 11}	% Survival	Grab	Twice Annually
Priority Pollutants ^{12, 13}	mg/l	As Appropriate ¹⁴	Annually ¹⁵

² Total coliform organisms samples may be collected at any point following disinfection, provided that samples are dechlorinated at the time of collection. The Discharger shall report the sampling location(s) in the monthly self-monitoring reports.

³ Total coliform organisms shall be monitored twice weekly until coagulation facilities are operational. After coagulation facilities are operational and any necessary filtration system improvements are completed, the monitoring frequency for total coliform organisms shall be increased to three times per week.

⁴ Report as total ammonia.

⁵ Concurrent with biotoxicity monitoring.

⁶ In reporting lbs/day, the Discharger shall report both the lbs/day discharged and the calculated lbs/day limitation.

⁷ Temperature and pH shall be recorded at the time of ammonia sample collection.

⁸ The BOD and TSS samples shall be flow proportional composite samples.

⁹ Monitoring for nitrite shall be conducted concurrently with nitrate monitoring no less than twice each month.

¹⁰ The acute bioassay samples shall be analyzed using EPA/600/4-90/027F, Fourth Edition, or later amendment with Regional Board staff approval. Temperature and pH shall be recorded at the time of bioassay sample collection. Test species shall be fathead minnows (*Pimephales promelas*), larval stage, with no pH adjustment unless approved by the Executive Officer.

¹¹ Concurrent with ammonia monitoring.

¹² All peaks are to be reported, along with any explanation provided by the laboratory.

¹³ Priority Pollutants is defined as U.S. EPA priority toxic pollutants and consists of the constituents listed in the most recent National Toxics Rule and California Toxics Rule.

¹⁴ Volatile samples shall be grab samples; the remainder shall be flow proportional 24-hour composite samples.

¹⁵ Hardness, pH, and temperature data shall be collected at the same time and on the same date as the Priority Pollutant samples.

If the discharge is intermittent rather than continuous, then on the first day of each such intermittent discharge, the Discharger shall monitor and record data for all of the constituents listed above, after which the frequencies of analysis given in the schedule shall apply for the duration of each such intermittent discharge. In no event shall the Discharger be required to monitor and record data more often than twice the frequencies listed in the schedule.

RECEIVING WATER MONITORING

Receiving water monitoring is required only during periods of discharge. All receiving water samples shall be grab samples. Receiving water monitoring shall include at least the following:

<u>Station</u>	<u>Description</u>
R-1	Deer Creek, 50 feet upstream from the point of discharge
R-2	Deer Creek, 50 feet downstream from the point of discharge
R-3	Deer Creek, about 500 feet downstream from the point of discharge, where Providence Mine Road most closely approaches Deer Creek

<u>Constituents</u>	<u>Units</u>	<u>Station</u>	<u>Sampling Frequency</u>
Dissolved Oxygen	mg/l ¹ % saturation ²	R-1, R-2, R-3	Weekly
pH	Number	R-1, R-2, R-3	Weekly
Turbidity	NTU	R-1, R-2, R-3	Weekly
Temperature	°F (°C)	R-1, R-2, R-3	Weekly
Electrical Conductivity @25°C	µmhos/cm	R-1, R-2, R-3	Weekly
Fecal Coliform Organisms	MPN/100 ml	R-1, R-2, R-3	Quarterly
Radionuclides	pCi/l ³	R-1, R-2, R-3	Annually

¹ Temperature shall be determined at the time of sample collection for use in determining saturation concentration. Any additional factors or parameters used in determining saturation concentration shall also be reported.
² Report both percent saturation and saturation concentration.
³ pCi/l = picocuries per liter

In conducting the receiving water sampling, a log shall be kept of the receiving water conditions throughout the reach bounded by Stations R-1, R-2, and R-3. Attention shall be given to the presence or absence of:

- a. Floating or suspended matter
- b. Discoloration
- c. Bottom deposits
- d. Aquatic life
- e. Visible films, sheens, or coatings
- f. Fungi, slimes, or objectionable growths
- g. Potential nuisance conditions

Notes on receiving water conditions shall be summarized in the monitoring report.

THREE SPECIES CHRONIC TOXICITY MONITORING

Chronic toxicity monitoring shall be conducted to determine whether the effluent is contributing toxicity to the receiving water. The testing shall be conducted as specified in EPA 600/4-91/002. Chronic toxicity samples shall be collected from the effluent of the wastewater treatment plant, after the last unit process, prior to its entering the receiving stream. Twenty-four hour composite samples shall be representative of the volume and quality of the discharge. Time of collection of samples shall be recorded. Control waters shall be obtained immediately upstream of the discharge from an area unaffected by the discharge in the receiving waters. The sensitivity of the test organisms to a reference toxicant shall be determined concurrently with each bioassay and reported with the test results. Monthly laboratory reference toxicant tests may be substituted. Both the reference toxicant and effluent test must meet all test acceptability criteria as specified in the chronic manual. If the test acceptability criteria are not achieved, then the Discharger must re-sample and re-test within 14 days. Chronic toxicity monitoring shall include the following:

Species: *Pimephales promelas* (larval stage), *Ceriodaphnia dubia*, and *Selenastrum capricornutum*

Frequency: Quarterly

Dilution Series: None—tests shall be conducted using 100% effluent.

SLUDGE MONITORING

A composite sample of sludge shall be collected annually in accordance with U.S. EPA's POTW Sludge Sampling and Analysis Guidance Document, August 1989, and tested for the metals listed in Title 22.

Sampling records shall be retained for a minimum of five 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.

Upon removal of sludge, the Discharger shall submit characterization of sludge quality, including sludge percent solids and quantitative results of chemical analysis for the priority pollutants listed in 40 CFR 122 Appendix D, Tables II and III (excluding total phenols). All sludge samples shall be a composite of a minimum of twelve (12) discrete samples taken at equal time intervals over 24 hours. Suggested methods for analysis of sludge are provided in U.S. EPA 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). Other guidance is available in U.S. EPA's POTW Sludge Sampling and Analysis Guidance Document, August 1989.

WATER SUPPLY MONITORING

A sampling station shall be established where a representative sample of the municipal water supply can be obtained. Water supply monitoring shall include at least the following:

<u>Constituents</u>	<u>Units</u>	<u>Sampling Frequency</u>
Electrical Conductivity @ 25°C	µmhos/cm	Annually
Total Dissolved Solids	mg/l	Annually

If the water supply is from more than one source, the monitoring report shall report the electrical conductivity and total dissolved solids results as a weighted average and include copies of supporting calculations.

REPORTING

Discharger self-monitoring results shall be submitted to the Regional Board monthly. Monitoring results shall be submitted by the **first day of the second month** following sample collection. Quarterly, semi-annual, and annual monitoring results shall be submitted by the **first day of the second month following each calendar quarter**.

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 clearly illustrate whether the discharge complies with waste discharge requirements. Monthly maximums, minimums, and averages shall be reported for each monitored constituent and parameter. Removal efficiencies (%) for biochemical oxygen demand and total suspended solids and all periodic averages and medians for which there are limitations shall also be calculated and reported.

The Discharger shall report minimum levels and method detection limits as defined in and required by the SIP.

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. The duration of excursions outside of limitations shall be reported.

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 certification statement by the Discharger, or the Discharger's authorized agent, as described in the Standard Provisions.

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.

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 WWTP (Standard Provision A.5).*
- 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 and other monitoring instruments and devices were last calibrated, including identification of who performed the calibration (Standard Provision C.6).*
- 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.*

The Discharger may also be requested to submit an annual report to the Regional 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.

All reports submitted in response to this Order shall comply with the signatory requirements of Standard Provision D.6.

The Discharger shall implement the above monitoring program on the first day of the month following the effective date of this Order.

Ordered by: *Kenneth D. Larson*
for GARY M. CARLTON, Executive Officer

4/26/62
(Date)

**Temperature- and pH-Dependent Effluent Limits for Ammonia
 Criterion Continuous Concentration, Maximum Average Monthly Concentration**

Ammonia Concentration Limitation (mg N/l)										
Temperature, °C (°F)										
pH	0 (32)	14 (57)	16 (61)	18 (64)	20 (68)	22 (72)	24 (75)	26 (79)	28 (82)	30 (86)
6.5	6.67	6.67	6.06	5.33	4.68	4.12	3.62	3.18	2.80	2.46
6.6	6.57	6.57	5.97	5.25	4.61	4.05	3.56	3.13	2.75	2.42
6.7	6.44	6.44	5.86	5.15	4.52	3.98	3.50	3.07	2.70	2.37
6.8	6.29	6.29	5.72	5.03	4.42	3.89	3.42	3.00	2.64	2.32
6.9	6.12	6.12	5.56	4.89	4.30	3.78	3.32	2.92	2.57	2.25
7.0	5.91	5.91	5.37	4.72	4.15	3.65	3.21	2.82	2.48	2.18
7.1	5.67	5.67	5.15	4.53	3.98	3.50	3.08	2.70	2.38	2.09
7.2	5.39	5.39	4.90	4.31	3.78	3.33	2.92	2.57	2.26	1.99
7.3	5.08	5.08	4.61	4.06	3.57	3.13	2.76	2.42	2.13	1.87
7.4	4.73	4.73	4.30	3.78	3.32	2.92	2.57	2.26	1.98	1.74
7.5	4.36	4.36	3.97	3.49	3.06	2.69	2.37	2.08	1.83	1.61
7.6	3.98	3.98	3.61	3.18	2.79	2.45	2.16	1.90	1.67	1.47
7.7	3.58	3.58	3.25	2.86	2.51	2.21	1.94	1.71	1.50	1.32
7.8	3.18	3.18	2.89	2.54	2.23	1.96	1.73	1.52	1.33	1.17
7.9	2.80	2.80	2.54	2.24	1.96	1.73	1.52	1.33	1.17	1.03
8.0	2.43	2.43	2.21	1.94	1.71	1.50	1.32	1.16	1.02	0.897
8.1	2.10	2.10	1.91	1.68	1.47	1.29	1.14	1.00	0.879	0.773
8.2	1.79	1.79	1.63	1.43	1.26	1.11	0.973	0.855	0.752	0.661
8.3	1.52	1.52	1.39	1.22	1.07	0.941	0.827	0.727	0.639	0.562
8.4	1.29	1.29	1.17	1.03	0.906	0.796	0.700	0.615	0.541	0.475
8.5	1.09	1.09	0.990	0.870	0.765	0.672	0.591	0.520	0.457	0.401
8.6	0.920	0.920	0.836	0.735	0.646	0.568	0.499	0.439	0.386	0.339
8.7	0.778	0.778	0.707	0.622	0.547	0.480	0.422	0.371	0.326	0.287
8.8	0.661	0.661	0.601	0.528	0.464	0.408	0.359	0.315	0.277	0.244
8.9	0.565	0.565	0.513	0.451	0.397	0.349	0.306	0.269	0.237	0.208
9.0	0.486	0.486	0.442	0.389	0.342	0.300	0.264	0.232	0.204	0.179

$$CCC = \left(\frac{0.0577}{1 + 10^{7.688 - pH}} + \frac{2.487}{1 + 10^{pH - 7.688}} \right) \times \text{MIN} \left(2.85, 1.45 \cdot 10^{0.028(25 - T)} \right)$$

Where: CCC = criteria continuous concentration
 T = temperature in degrees Celsius (°C)

**Temperature- and pH-Dependent Effluent Limits for Ammonia
 Maximum 4-day Average**

Ammonia Concentration Limitation (mg N/l)										
Temperature, °C (°F)										
pH	0 (32)	14 (57)	16 (61)	18 (64)	20 (68)	22 (72)	24 (75)	26 (79)	28 (82)	30 (86)
6.5	16.7	16.7	15.1	13.3	11.8	10.3	9.04	7.95	6.99	6.14
6.6	16.4	16.4	14.9	13.1	11.5	10.1	8.91	7.83	6.88	6.05
6.7	16.1	16.1	14.6	12.9	11.3	9.94	8.74	7.68	6.75	5.94
6.8	15.7	15.7	14.3	12.8	11.1	9.71	8.54	7.51	6.60	5.80
6.9	15.3	15.3	13.9	12.2	10.7	9.44	8.30	7.30	6.41	5.64
7.0	14.8	14.8	13.4	11.8	10.4	9.12	8.02	7.05	6.19	5.45
7.1	14.2	14.2	12.9	11.3	9.95	8.75	7.69	6.76	5.94	5.22
7.2	13.5	13.5	12.3	10.8	9.46	8.32	7.31	6.43	5.65	4.97
7.3	12.7	12.7	11.5	10.1	8.91	7.84	6.89	6.05	5.32	4.68
7.4	11.8	11.8	10.8	9.46	8.31	7.31	6.42	5.65	4.96	4.36
7.5	10.9	10.9	9.92	8.72	7.66	6.74	5.92	5.20	4.57	4.02
7.6	9.94	9.94	9.03	7.94	6.98	6.14	5.39	4.74	4.17	3.66
7.7	8.95	8.95	8.13	7.15	6.28	5.52	4.85	4.27	3.75	3.30
7.8	7.96	7.96	7.23	6.36	5.59	4.91	4.32	3.79	3.34	2.93
7.9	6.99	6.99	6.36	5.59	4.91	4.32	3.80	3.34	2.93	2.58
8.0	6.08	6.08	5.53	4.86	4.27	3.76	3.30	2.90	2.55	2.24
8.1	5.24	5.24	4.77	4.19	3.68	3.24	2.85	2.50	2.20	1.93
8.2	4.48	4.48	4.07	3.58	3.15	2.77	2.43	2.14	1.88	1.65
8.3	3.81	3.81	3.46	3.04	2.68	2.35	2.07	1.82	1.60	1.40
8.4	3.22	3.22	2.93	2.58	2.26	1.99	1.75	1.54	1.35	1.19
8.5	2.72	2.72	2.48	2.18	1.91	1.68	1.48	1.30	1.14	1.00
8.6	2.30	2.30	2.09	1.84	1.61	1.42	1.25	1.10	0.964	0.848
8.7	1.95	1.95	1.77	1.55	1.37	1.20	1.06	0.928	0.816	0.717
8.8	1.65	1.65	1.50	1.32	1.16	1.02	0.897	0.788	0.693	0.609
8.9	1.41	1.41	1.28	1.13	0.992	0.872	0.766	0.674	0.592	0.520
9.0	1.22	1.22	1.11	0.971	0.854	0.751	0.660	0.580	0.510	0.448

$$2.5CCC = 2.5 \times \left(\frac{0.0577}{1 + 10^{7.688 - pH}} + \frac{2.487}{1 + 10^{pH - 7.688}} \right) \times \text{MIN} \left(2.85, 1.45 \cdot 10^{0.028(25 - T)} \right)$$

Where: CCC = criteria continuous concentration
 T = temperature in degrees Celsius (°C)

pH-Dependent Effluent Limits for Ammonia
Criterion Maximum Concentration, Maximum 1-hour Average

pH	Ammonia Concentration Limit (mg N/l)
6.5	32.6
6.6	31.3
6.7	29.8
6.8	28.0
6.9	26.2
7.0	24.1
7.1	21.9
7.2	19.7
7.3	17.5
7.4	15.3
7.5	13.3
7.6	11.4
7.7	9.64
7.8	8.11
7.9	6.77
8.0	5.62
8.1	4.64
8.2	3.83
8.3	3.15
8.4	2.59
8.5	2.14
8.6	1.77
8.7	1.47
8.8	1.23
8.9	1.04
9.0	0.885

$$CMC_{salmonids\ present} = \left(\frac{0.275}{1 + 10^{7.204 - pH}} + \frac{39.0}{1 + 10^{pH - 7.204}} \right)$$

Where: CMC = criteria maximum concentration

FACT SHEET

ORDER NO. R5-2002-0050
CITY OF NEVADA CITY
NEVADA COUNTY
NPDES NO. CA0079901

SCOPE OF PERMIT

This renewed Order regulates the discharge of up to 0.69 million gallons per day (mgd), design average dry weather flow (ADWF), of effluent from the Nevada City Wastewater Treatment Plant (WWTP). This Order includes effluent, water supply, sludge, and surface water limitations, monitoring and reporting requirements, additional study requirements, and reopener provisions for effluent constituents.

BACKGROUND INFORMATION

The City of Nevada City (Discharger) provides sewerage service for the City of Nevada City, which has a population of approximately 3,000. The WWTP design average dry weather flow capacity is 0.69 mgd. The treatment system consists of grit removal, comminution, biological treatment in sequencing batch reactors, sand filtration, pH adjustment, and chlorination/dechlorination. Sludge is treated in an aerobic digester, dewatered by a belt filter press, and hauled to the Redwood landfill in Navato. Treated wastewater is discharged into Deer Creek, which flows into Lake Wildwood prior to being discharged downstream to the lower reaches of Deer Creek and the Yuba River.

RECEIVING WATER BENEFICIAL USES

The receiving stream is Deer Creek, which is tributary to the Yuba River downstream of Englebright Dam. 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 within the receiving water is that discharge limitations based on acute and chronic toxicity are end-of-pipe limits with no allowance for dilution within the receiving water.

The beneficial uses of Deer Creek are not individually identified in the Basin Plan. However, the Plan requires that the beneficial uses of any specifically identified water body apply to its tributary streams. Upon review of the flow conditions, habitat values, and beneficial uses of Deer Creek, the Regional Board finds that the beneficial uses identified in the Basin Plan for the Yuba River downstream of Englebright Dam are applicable to Deer Creek. The Basin Plan identifies the following beneficial uses for the Yuba River downstream of Englebright Dam: agricultural irrigation, agricultural stock watering, hydropower generation, body contact water recreation, non-contact water recreation, warm freshwater aquatic habitat, cold freshwater aquatic habitat, warm fish migration habitat, cold fish migration habitat, warm spawning habitat, cold spawning habitat, and wildlife habitat.

The Basin Plan states that "*Water Bodies within the basins that do not have beneficial uses designated in Table II-1 are assigned MUN designations in accordance with the provisions of State Water Board Resolution No. 88-63 which is, by reference, a part of this Basin Plan.*" State Water Resources Control Board Resolution No. 88-63 "Sources of Drinking Water" provides that "*All surface and ground waters*

CITY OF NEVADA CITY
WASTEWATER TREATMENT PLANT
NEVADA COUNTY

of the State are considered to be suitable, or potentially suitable, for municipal or domestic water supply and should be so designated by the Regional Boards with... certain exceptions. Deer Creek does not meet the criteria for an exemption from the beneficial use of municipal and domestic supply, so the MUN designation is applied. The beneficial use of municipal and domestic supply is applicable to Deer Creek based on Resolution 88-63, the Basin Plan tributary rule, and actual uses.

Downstream of the discharge, land adjacent to Deer Creek is zoned primarily for low-density housing. There are significant public access locations to Deer Creek including roads, pathways, and hiking trails. Deer Creek flows into Lake Wildwood, a manmade reservoir, which is surrounded by the community of Lake Wildwood. Lake Wildwood is used for body-contact water recreational uses. The uses of Lake Wildwood are equivalent to those in a nonrestricted recreational impoundment, as defined in the California Code of Regulations, Title 22 Reclamation Criteria. The reservoir may concentrate wastewater constituents, as water evaporates and percolates, prior to being discharged downstream to the lower reaches of Deer Creek and into the Yuba River. The lower reaches of Deer Creek and the Yuba River also provide opportunities for recreational activities.

Deer Creek flows to the Yuba River. The Basin Plan (Table II-1) designates the Yuba River as being both a cold and warm freshwater habitat. Pursuant to the Basin Plan tributary rule, the warm and cold freshwater habitat designations applied to the Yuba River also apply to Deer Creek. The cold-water habitat designation for Deer Creek is appropriate since the California Department of Fish and Game has recorded the presence of trout in these waters. The cold freshwater habitat designation necessitates that the in-stream dissolved oxygen concentration be maintained at, or above, 7.0 mg/l.

EFFLUENT LIMITATIONS

All mass limitations in Order No. R5-2002-0050 were calculated by multiplying the concentration limitation by the design flow and the appropriate unit conversion factors.

Flow—The WWTP was designed to provide a tertiary level of treatment for up to its design flow of 0.69 mgd. The effluent flow limit is therefore set at 0.69 mgd.

Total Coliform Organisms—Tertiary treatment is required to protect the beneficial uses of contact recreation and agricultural irrigation downstream of the discharge into Deer Creek. The effluent limitation for total coliform organisms is intended as an indicator of the effectiveness of the entire treatment train and the effectiveness of pathogen removal. The method of treatment is not prescribed by Order No. R5-2002-0050; however, wastewater must be treated to a level equivalent to that specified in Title 22 and in other recommendations by the California Department of Health Services.

Upstream of the discharge point, Deer Creek is a low-flow stream. At times, Deer Creek provides little or no dilution for wastewater effluent discharged from the WWTP. The California Code of Regulations, Title 22, contains criteria for the reuse or recycling of wastewater as an alternative to discharging to a receiving stream. Title 22 reclamation criteria were established to create minimum wastewater treatment standards to protect the public health when this water is reused for beneficial uses. The criteria are not directly applicable to streams that receive wastewater and the subsequent use of the combined

stream/wastewater. This permit does not apply Title 22 standards to the discharge. However, in assessing the discharge standards necessary to protect the site-specific beneficial uses of Deer Creek, Title 22 standards were compared to the level of treatment required to protect the public health when in contact with treated wastewater or when directly using undiluted effluent for food crop irrigation. Title 22 states that, for reuse as irrigation water for food crops and to protect for nonrestricted contact recreation, it is necessary for wastewater to receive tertiary treatment resulting in coliform counts that do not exceed 2.2 MPN/100 ml as a 7-day median, 23 MPN/100 ml more than once in any 30 day period, and 240 MPN/100 ml ever.

The California Department of Health Services (DHS) has determined that a specific level of treatment is required for recycled water delivered in a dedicated pipe or canal. Deer Creek, a low-flow stream, is essentially the same as any other conveyance system (pipe or canal) when sufficient upstream flows are not present for dilution. Therefore, the same level of treatment as that required for recycled water would be necessary to protect the public if the water is delivered in a dry streambed for the same uses. In a letter to Regional Board staff, dated 8 April 1999, DHS concurred with the need to protect beneficial uses and recommended that the level of treatment required under Title 22 of the California Code of Regulations for reclaimed water in a dedicated pipe or canal be applied to agricultural drains or streams where the water may be used or diverted for beneficial uses. Therefore, Order No. R5-2002-0050 includes tertiary effluent limitations based on protecting the beneficial uses of nonrestricted contact recreation and irrigation in Deer Creek, Lake Wildwood, and the Yuba River.

Turbidity— In addition to coliform testing, a turbidity effluent limitation has been included as a second indicator of the effectiveness of the treatment process and to assure compliance with the required level of treatment. The tertiary treatment process, or equivalent, is also capable of reliably meeting a reduced turbidity limitation of 2 NTU as a daily average, 5 NTU at least 95 percent of the time within a day, and 10 NTU at all times. Failure of the filtration system, such that virus removal is impaired, would normally result in increased particles in the effluent and higher effluent turbidity. Turbidity monitoring has a major advantage over coliform monitoring for evaluating filter performance, allowing immediate detection of filter failure and rapid corrective action. Coliform testing, by comparison, is not conducted continuously and requires several hours to days to identify high coliform concentrations.

BOD and TSS—40 Code of Federal Regulations (CFR), Section 133.102 contains regulations describing the minimum level of effluent quality—for biochemical oxygen demand (BOD) and total suspended solids (TSS)—attainable by secondary treatment.

The WWTP is required to comply with effluent limitations appropriate for treatment systems providing tertiary or equivalent treatment. Effluent limitations for both BOD and TSS have been established at 10 mg/l, as a 30-day average, which is technically based on the capability of a tertiary system. In addition, 40 CFR 133.102, in describing the minimum level of effluent quality attainable by secondary treatment, states that the 30-day average percent removal shall not be less than 85 percent. If 85 percent removal of BOD 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. The report of waste discharge indicated that the plant's design percent removal of BOD and TSS is 95 percent. Order No. R5-2002-0050

contains a limitation requiring an average of 95 percent removal of BOD and TSS over each calendar month.

Cost of Compliance with Tertiary Treatment Requirements—Regional Board staff consulted State Water Resources Control Board, Division of Clean Water Programs staff regarding the cost of upgrading the wastewater treatment plant to provide a tertiary level of treatment. State Water Resources Control Board staff responded with the following cost estimates for the existing 0.69 million gallons per day average dry weather (design) flow plant:

- Addition of one flocculation tank: \$100,000
- Addition of second traveling bridge sand filter: \$300,000
- Addition of in-line chemical addition: \$50,000

Total Residual Chlorine—Chlorine is commonly used as a disinfection agent in the treatment of wastewater. The City of Nevada City uses chlorine gas for disinfection at its WWTP. For dechlorination, the Discharger uses sulfur dioxide, which combines with chlorine, to render it relatively unreactive and thus remove it from the waste stream. Inadequate dechlorination may result in discharge of chlorine to the receiving stream. For chlorine, U.S. EPA has developed Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life. The recommended maximum one-hour average concentration for chlorine is 0.019 mg/l and the recommended maximum four-day average concentration is 0.011 mg/l. The U.S. EPA Technical Support Document for Water Quality-Based Toxics Control [EPA/505/2-90-001] contains statistical methods for converting chronic (four-day) and acute (one-hour) aquatic life criteria to average monthly and maximum daily effluent limitations based on the variability of the existing data and the expected frequency of monitoring. Equations summarizing the conversion are shown below:

$$\begin{aligned} \text{CCC} &= 0.011 \text{ mg/l} & \text{CMC} &= 0.019 \text{ mg/l} \\ \text{AMEL} &= 1.03[\min(0.797\text{CMC}, 0.891\text{CCC})] & \text{MDEL} &= 1.25[\min(0.797\text{CMC}, 0.891\text{CCC})] \end{aligned}$$

where: AMEL = average monthly effluent limitation
MDEL = maximum daily effluent limitation
CCC = criteria continuous concentration (four-day average)
CMC = criteria maximum concentration (one-hour average)

The resulting average monthly effluent total residual chlorine concentration limitation is 0.010 mg/l. Because chlorine is a toxic that can be and is being monitored continuously, an average one-hour limitation is considered more appropriate than an average daily limitation. Average monthly and average one-hour effluent limitations for chlorine, based on these criteria, are included in Order No. R5-2002-0050.

Ammonia, Nitrite, and Nitrate—Untreated domestic wastewater contains ammonia. Nitrification is a biological process that converts ammonia to nitrite and nitrite to nitrate, and denitrification is a process that converts nitrate to nitrogen gas, which is then released to the atmosphere. Wastewater treatment plants commonly use nitrification and denitrification processes to remove ammonia from the waste

potential for the discharge to exceed the primary maximum contaminant levels for nitrite and the sum of nitrite and nitrate. Therefore, Order No. R5-2002-0050 includes limitations for nitrite and the sum of nitrite and nitrate.

pH—The Basin Plan includes a water quality objective for surface waters (except for Goose Lake) that the “...pH shall not be depressed below 6.5 nor raised above 8.5.” No reliable dilution is available in the receiving stream, so the Order includes effluent limitations for pH at the Basin Plan objective values.

Toxicity—The Basin Plan states that “[a]ll waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances.” The Basin Plan requires that “[a]s a minimum, compliance with this objective...shall be evaluated with a 96-hour bioassay.” Order No. R5-2002-0050 requires both acute and chronic toxicity monitoring to evaluate compliance with this water quality objective.

The low-flow nature of Deer Creek means that the designated beneficial uses must be protected, but that no credit for receiving water dilution is available. The use of a dilution series to evaluate compliance with the narrative toxicity objective contained in the Basin Plan is, therefore, inappropriate.

The Basin Plan further states that “...effluent limits based upon acute biotoxicity tests of effluents will be prescribed...”. Effluent limitations for acute toxicity have been included in the Order.

General Effluent Limitation Information—

Selected 40 CFR §122.2 definitions:

Average monthly discharge limitation means the highest allowable average of “daily discharges” over a calendar month, calculated as the sum of all “daily discharges” measured during a calendar month divided by the number of “daily discharges” measured during that month.

Average weekly discharge limitation means the highest allowable average of “daily discharges” over a calendar week, calculated as the sum of all “daily discharges” measured during a calendar week divided by the number of “daily discharges” measured during that week.

Continuous discharge means a “discharge” which occurs without interruption throughout the operating hours of the facility, except for infrequent shutdowns for maintenance, process changes, or other similar activities.

Daily discharge means the “discharge of a pollutant” measured during a calendar day or any 24-hour period that reasonably represents a calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the “daily discharge” is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of

Dissolved Oxygen—By the tributary rule, Deer Creek has been designated as having the beneficial use of cold freshwater aquatic habitat (COLD). The California Department of Fish and Game has documented the presence of rainbow and brown trout in Deer Creek.

For water bodies designated as having COLD as a beneficial use, the Basin Plan includes a water quality objective of maintaining a minimum of 7.0 mg/l of dissolved oxygen. Since, by the tributary rule, the beneficial use of COLD does apply to Deer Creek, a receiving water limitation of 7.0 mg/l for dissolved oxygen was included in the Order.

For surface water bodies outside of the Delta, the Basin Plan includes the water quality objective that “...the monthly median of the mean daily dissolved oxygen (DO) concentration shall not fall below 85 percent of saturation in the main water mass, and the 95 percentile concentration shall not fall below 75 percent of saturation.” This objective was included as a receiving water limitation in the Order.

pH—For all surface water bodies in the Sacramento River and San Joaquin River basins, the Basin Plan includes water quality objectives stating that “[t]he pH shall not be depressed below 6.5 nor raised above 8.5. Changes in normal ambient pH levels shall not exceed 0.5 in fresh waters with designated COLD or WARM beneficial uses.” By the tributary rule, Deer Creek has the beneficial uses of both COLD and WARM (warm freshwater habitat); therefore, the Order includes receiving water limitations for both pH range and pH change.

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

Temperature—By the tributary rule, the unnamed tributary to Powell Slough has the beneficial uses of both COLD and WARM. The Basin Plan includes the objective that “[a]t no time or place shall the temperature of COLD or WARM intrastate waters be increased more than 5°F above natural receiving water temperature.” The Order includes a receiving water limitation based on this objective.

Turbidity—The Basin Plan includes the following objective: “Increases in turbidity attributable to controllable water quality factors shall not exceed the following limits:

- Where natural turbidity is between 0 and 5 Nephelometric Turbidity Units (NTUs), increases shall not exceed 1 NTU.
- Where natural turbidity is between 5 and 10 NTUs, increases shall not exceed 20 percent.
- Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTU.
- Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent.”

The Basin Plan allows an appropriate averaging period for turbidity increases in the receiving stream. The turbidity objective in the Basin Plan is based on antidegradation and not on protection of aquatic life. The effluent limitations in Order No. R5-2002-0050 are the best practicable treatment levels available from a tertiary treatment system. An averaging period for low turbidity levels will not result in degradation of beneficial uses of the receiving stream. Therefore, when the discharged wastewater has been treated to a tertiary level, an averaging period of one month may be used in determining compliance with the 0 to 5 NTU background turbidity increase limitation.

Ammonia and Chlorine—U.S. EPA has developed Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life for ammonia and for chlorine. The Order contains effluent limitations for ammonia and for chlorine equal to the Ambient Water Quality Criteria. Compliance with the effluent limitations for ammonia and for chlorine means that the discharge cannot cause an exceedance of the criteria in the receiving stream; in other words, the limitations are fully protective of water quality. Therefore, no receiving water ammonia or chlorine limitations are included in the Order.

Narrative Limitations—Receiving Water Limitations 2 (biostimulatory substances), 3 (color), 5 (floating material), 6 (oil and grease), 8 (radioactivity), 9 (settleable material), 10 (tastes and odors), and 12 (toxicity) are based on narrative Basin Plan objectives. The objectives are located in Chapter III: Water Quality Objectives, under the Water Quality Objectives for Inland Surface Waters heading.