Fact Sheet

NPDES Permit Number: **OR-003263-8**
Date:
Public Notice Expiration Date:
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The U.S. Environmental Protection Agency (EPA) Plans To Issue A Wastewater Discharge Permit To Discharge Pollutants And To Store Sewage Sludge (Biosolids) Pursuant To The Provisions of the Clean Water Act To:

Confederated Tribes of Warm Springs Reservation of Oregon Wastewater Treatment Plant
Warm Springs, Oregon 97761

and
the Confederated Tribes of the Warm Springs Reservation of Oregon Proposes to Certify the Permit

EPA Proposes NPDES Permit Issuance.
EPA proposes to issue a *National Pollutant Discharge Elimination System* (NPDES) permit to the Confederated Tribes of the Warm Springs Reservation of Oregon (CTWSRO). The draft permit sets conditions on the discharge--or release--of pollutants from the CTWSRO wastewater treatment plant to Shitike Creek. It also authorizes the wastewater treatment plant to store sewage sludge, called *biosolids*. In order to ensure protection of water quality and human health, the permit places limits on the types and amounts of pollutants that can be discharged.

This Fact Sheet includes:
- information on public comment, public hearing, and appeal procedures
- a description of the discharge
- a listing of proposed effluent limitations, monitoring and compliance schedules, and other conditions
- a map and description of the discharge location and the biosolids disposal locations
- detailed technical material supporting the conditions in the permit

The Confederated Tribes of the Warm Springs Reservation of Oregon Proposes Certification.

EPA is requesting the CTWSRO certify the NPDES permit for the CTWSRO wastewater treatment plant, under section 401 of the Clean Water Act. The CTWSRO provided preliminary comments prior to the Public Notice which have been incorporated.

Public Comment.

EPA will consider all substantive comments before issuing the final permit. Those wishing to comment on the draft permit may do so in writing by the expiration date of the Public Notice. A request for public hearing must state the nature of the issues to be raised as well as the requester's name, address and telephone number. After the Public Notice expires, and all comments have been considered, EPA's regional Director for the Office of Water will make a final decision regarding permit issuance.

If no substantive comments are received, the tentative conditions in the draft permit will become final, and the permit will become effective upon issuance. If comments are received, EPA will address the comments and issue the permit. The permit will become effective 30 days after the issuance date, unless a request for an evidentiary hearing is submitted within 30 days.

Documents are Available for Review.

The draft NPDES permit and related documents can be reviewed or obtained by visiting or contacting EPA's Operations Office in Portland between 8:30 a.m. and 4:00 p.m., Monday through Friday at:

United States Environmental Protection Agency
Oregon Operations Office
811 SW 6th Avenue, 3rd Floor
Portland, Oregon 97204
(503) 326-2653

The Fact Sheet and draft permit are also available at:

United States Environmental Protection Agency
Region 10
1200 Sixth Avenue, OW-130
Seattle, Washington 98101
(206) 553-8414 or 1-800-424-4372 (within Region 10)

Tribal Administration Building
Mail Reception Desk
ATTN: Patches
Tenino Road
Warm Springs, Oregon 97761
(541) 553-1161

Draft permits, Fact Sheets, and other information can also be found by visiting the Region 10 website at www.epa.gov/r10earth/offices/water/npdes.htm

For technical questions regarding the permit or fact sheet, contact Kelly Huynh or Willie Olandria at the phone numbers or email addresses at the top of this fact sheet. Those with impaired hearing or speech may contact a TDD operator at 1-800-833-6384. Ask to be connected to Willie Olandria or Kelly Huynh at the above phone number. Additional services can be made available to persons with disabilities by contacting Willie Olandria or Kelly Huynh.

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APPENDICES

I. APPLICANT

Confederated Tribes of the Warm Springs Reservation of Oregon
NPDES Permit No.: OR-003263-8

P.O. Box 1196
Warm Springs, Oregon 97761

Facility contact: Herb Graybael, Tribal Utilities Manager

II. FACILITY ACTIVITY

The Confederated Tribes of Warm Springs Reservation of Oregon (CTWSRO) owns and operates a wastewater treatment plant (WWTP) that is located at the east end of Victory Lane just south of highway 26. The WWTP currently provides treatment equivalent to secondary using a series of aerated and facultative lagoons. Chlorine disinfection is currently provided prior to discharge. The WWTP has a daily maximum design flow of 0.646 million gallons per day (mgd) however, the chlorine contact tanks and the lagoon system were designed for an average flow of 0.372 mgd. The original design was for a population of 2,860 and based on a unit flow of 130 gallons per capita per day.

The CTWSRO is currently in the process of upgrading the WWTP. Improvements are being made to the existing lagoons, a wetland treatment facility is being constructed to polish the lagoon effluent, and ultraviolet (UV) radiation disinfection will replace chlorination. The upgraded WWTP is being designed for an average daily flow rate of 0.87 mgd. Details about the wastewater treatment processes and waste streams are included in Appendix A.

The WWTP receives residential and commercial domestic wastewater from the Warm Springs Agency Campus area. There are no industrial dischargers to the system and the collection system consists of separate sewer lines. Appendix B includes a map of the location of the treatment plant and discharge.

III. RECEIVING WATER

The CTWSRO plant discharges to Shitike Creek, a tributary of the Deschutes River. Because the Creek is within the Warm Springs Reservation, the permit was written to meet the water quality standards set by the CTWSRO Tribal Council. The Tribe's water quality standards are at least as stringent as the State of Oregon's water quality standards for the Deschutes River. The existing uses for Shitike Creek are found in Tables 1 and 4 of the Tribes water quality standards and include industrial water supply; salmonid fish rearing; resident fish and aquatic life; wildlife and hunting; fishing; and water contact recreation. United States Geological Survey (USGS) data from 1913 through 1974 (Station 14093000) indicates that the 7Q10 for this reach of Shitike Creek is 33 cubic feet per second (cfs) and the 1Q10 is 31 cfs.

IV. FACILITY BACKGROUND

The original wastewater treatment system, constructed in 1966, for the Warm Springs community consisted of one primary cell and one secondary cell. The wastewater treatment plant was then refurbished in 1974. In 1981, an additional 4.5 acre cell (cell No. 3) was constructed and four 7.5 horsepower aerators were installed in cell No. 2. In 1982, the lagoon cells were lined with an impervious vinyl material and a gas chlorination (disinfection) system was installed. An application for an NPDES permit was received by EPA on October 28, 1988.

V. EFFLUENT LIMITATIONS

EPA followed the Clean Water Act, federal regulations, CTWSRO Water Quality Standards and EPA's 1991 Technical Support Document for Water Quality-Based Toxics Control (TSD) to develop the draft interim and final effluent limits.

In general, the Clean Water Act requires that the effluent limits for a particular pollutant be the more stringent of either the technology-based or water quality-based limits. Technology-based limits are set based on the level of treatment that is achievable using available technology. Water quality-based limits are required for pollutants that are discharged at levels that could cause or contribute to an excedence of the CTWSRO's Water Quality Standards (WQS) in Shitike Creek. The determination of the need for water quality-based limits is presented in Appendix C.

A. Interim Permit Limits.

The Tribe is in the process of upgrading the WWTP. Construction is expected to be complete before the NPDES permit expires. Therefore, the draft permit contains interim limits that apply from the permit effective date to five years minus one day from the permit effective date. The interim limits for five day Biochemical Oxygen Demand (BOD_5) and total suspended solids (TSS) are based on the technology available for treatment works that provide equivalent to secondary treatment. Water quality-based limits were also developed, consistent with the CTWSRO's WQS, for chlorine, pH, and E. coli. The interim limits are contained in Table V-1.

Table V-1: Interim Effluent Limitations for Outfall 001

PARAMETER	EFFLUENT LIMITATIONS		
	Average Monthly Limit	Average Weekly Limit	Daily Maximum Limit
BOD_5[1]	45 mg/L 140 lbs/day	65 mg/L 202 lbs/day	--- ---
TSS[1]	45 mg/L 140 lbs/day	65 mg/L 202 lbs/day	--- ---

Table V-1: Interim Effluent Limitations for Outfall 001			
	EFFLUENT LIMITATIONS		
PARAMETER	**Average Monthly Limit**	**Average Weekly Limit**	**Daily Maximum Limit**
E. Coli Organisms	126/100 ml	---	406/100 ml
Total Residual Chlorine	0.140 mg/L 0.47 lbs/day	---	0.272 mg/L 0.844 lbs/day
pH[2]	---	---	---
Notes: 1 The monthly average percent removal for BOD_5 and TSS shall be greater than or equal to 65%. 2 The effluent pH shall be within the range of 6.5 - 8.5 standard units at all times.			

The draft permit also requires that during the interim period discharges be free from floating, suspended, or submerged matter in concentrations that cause/may cause a nuisance. The permit also prohibits discharges of waste streams that are not part of the normal operation of the facility, as reported in the permit application.

B. Final Permit Limits.

The upgraded WWTP will be secondary (i.e. provides biological treatment) and utilize UV disinfection instead of chlorine. Therefore, beginning one day minus five years from the effective date of the permit the tribe's WQSs apply for the BOD_5, TSS, E. coli, pH and ammonia limits. These final effluent limits are contained in Table V-2.

Table V-2: Final Effluent Limitations for Outfall 001			
	EFFLUENT LIMITATIONS		
PARAMETER	**Average Monthly Limit**	**Average Weekly Limit**	**Daily Maximum Limit**
BOD_5[1] April 1-October 31 November 1-March 31	 10 mg/L, 73 lbs/day 30mg/L, 217 lbs/day	 15 mg/L, 109 lbs/day 45 mg/L, 327 lbs/day	 --- ---
TSS[1] April 1-October 31 November 1-March 31	 10 mg/L, 73 lbs/day 30mg/L, 217 lbs/day	 15 mg/L, 109 lbs/day 45 mg/L, 327 lbs/day	 --- ---
E. Coli	126/100 ml	---	406/100 ml
Total Ammonia (as N)	2.4 mg/L 17.4 lbs/day	---	6.8 mg/L 49.3 lbs/day

Table V-2: Final Effluent Limitations for Outfall 001			
PARAMETER	EFFLUENT LIMITATIONS		
	Average Monthly Limit	Average Weekly Limit	Daily Maximum Limit
pH[2]	---	---	---

Notes:
1 The monthly average percent removal for BOD_5 and TSS shall be greater than or equal to 85%.
2 The effluent pH shall be within the range of 6.5 - 8.5 standard units at all times.

The draft permit also requires that at all times discharges be free from floating, suspended, or submerged matter in concentrations that cause/may cause a nuisance. It also prohibits discharges of waste streams that are not part of the normal operation of the facility, as reported in the permit application.

VI. MUNICIPAL SEWAGE SLUDGE/BIOSOLIDS MANAGEMENT

Currently, biosolids from the CTWSRO WWTP are stored at the bottom of the facultative ponds. The permittee does not anticipate having to remove the biosolids from the bottom of the ponds during the term of the permit (five years).

Section 405(f) of the CWA requires sludge use and disposal requirements to be incorporated into NPDES permits issued to a treatment works treating domestic wastewater. In addition, the biosolids permitting regulations in 40 CFR 122 and 124 apply to all treatment works treating domestic wastewater.

General conditions have been incorporated into the draft permit requiring the permittee to comply with all existing federal and state laws, and all regulations applying to biosolids use and disposal.

VII. MONITORING REQUIREMENTS

A. Influent/Effluent Monitoring.

Section 308 of the Clean Water Act and federal regulation 40 CFR 122.44(i) requires that monitoring be included in permits to determine compliance with effluent limitations. Monitoring may also be required to gather data for future effluent limitations or to monitor effluent impacts on receiving water quality. The Permittee is responsible for conducting the monitoring and for reporting results on quarterly Discharge Monitoring Reports (DMRs) to EPA.

Table VII-1 presents the draft monitoring requirements based on the minimum sampling necessary to adequately monitor the facility's performance. Effluent

monitoring shall occur after the last treatment unit and prior to discharge to Shitike Creek.

TABLE VII-1. Monitoring Requirements for Outfall 001		
Parameter[1]	**Sample Frequency**	**Sample Location**
Flow, mgd	Continuous	Influent or Effluent
BOD_5, mg/L[2]	1/week	Influent and Effluent
TSS, mg/L[2]	1/week	Influent and Effluent
pH, standard units[3]	2/week	Effluent
E. coli, organisms/100 ml	1/week	Effluent
Total Residual Chlorine, mg/L[4]	5/week	Effluent
Total Ammonia as N, mg/L	1/month	Effluent
Temperature, EC	1/month	Effluent

Notes:

1 If the discharge concentration falls below the method detection limit (MDL), the permittee shall report the effluent concentration as "less than {numerical MDL}" on the DMR. Actual analytical results shall be reported on the DMR when the results are greater than the MDL. For averaging, samples below the MDL shall be assumed equal to zero. See Section VII.D for the MDLs. The permittee shall report the number of non-detects for the month in the "Comments Section" of the DMR.

2 The percent BOD_5 and TSS removal will be reported on each quarterly DMR form.

3 The permittee shall report the pH values and number and duration of pH excursions during the quarter with the DMR for that quarter.

4 Monitoring is only required when chlorine is being used.

B. Representative Sampling.

The draft permit has expanded the requirement in the federal regulations regarding monitoring (40 CFR 122.41[j]). This provision now specifically requires representative sampling whenever a bypass, spill, or non-routine discharge of pollutants occurs, if the discharge may reasonably be expected to cause or contribute to a violation of an effluent limit under the permit. This provision is included in the draft permit because routine monitoring could easily miss permit violations and/or water quality standards excedences that could result from bypasses, spills, or non-routine discharges. This requirement directs the permittee to conduct additional, targeted monitoring to quantify the effects of these occurrences on the final effluent discharge.

C. Ambient Monitoring.

The draft permit requires the Permittee to conduct and submit quarterly ambient (in-stream) monitoring upstream of outfall 001 with the quarterly DMRs. The Permittee shall submit the monitoring site to EPA on the first quarterly DMR.

The ambient information will be used to verify background concentrations and determine compliance limits consistent with the ammonia criteria when the permit is reissued. Table VII-2 presents the monitoring requirements.

TABLE VII-2. Ambient Monitoring Requirements	
Parameter	**Sample Frequency**
Ammonia, mg/L	Quarterly
pH, standard units	Quarterly
Temperature, EC	Quarterly

D. Method Detection Limits.

The draft water quality-based effluent limits for chlorine are close to the capability of current analytical technology to detect and/or quantify. To address this concern, the permit contains a provision requiring the CTWSRO to use methods that can achieve a method detection limit (MDL) equal to 0.1 times the effluent limitation or the most sensitive EPA approved method, whichever is greater. Method Detection Limits are the minimum levels that can be accurately detected by current analytical technology. For purposes of averaging results, the draft permit requires the CTWSRO to use 0 for all values below the MDL.

VIII. OTHER PERMIT CONDITIONS

A. Quality Assurance Plan.

Federal regulation 40 CFR 122.41(e) requires the Permittee to develop and submit a Quality Assurance Plan to ensure that the monitoring data submitted is accurate and to explain data anomalies if they occur. The Permittee is required to submit a Quality Assurance Plan within 120 days of the effective date of the permit that consists of standard operating procedures the Permittee must follow for collecting, handling, storing and shipping samples, laboratory analysis, and data reporting.

B. Operation & Maintenance Plan.

Section 402 of the Clean Water Act and federal regulations 40 CFR 122.44(k)(2) and (3) authorize EPA to require best management practices, or BMPs, in NPDES permits. BMPs are measures for controlling the generation of pollutants and their release to waterways. For municipal facilities, these measures are typically included in the facility Operation & Maintenance (O&M) plans. These measures are important tools for waste minimization and pollution prevention.

The draft permit requires the CTWSRO to incorporate appropriate BMPs into their O&M plan within 180 days of permit issuance. Specifically, the Permittee

must consider spill prevention and control, optimization of chlorine and other chemical use, public education aimed at controlling the introduction of household hazardous materials to the sewer system, and water conservation. To the extent that any of these issues have already been addressed, the Permittee need only reference the appropriate document in its O&M plan. The O&M plan shall be revised as new practices are developed.

C. Additional Permit Provisions.

Sections III and IV of the draft permit contain "boilerplate" requirements. Boilerplate is standard regulatory language that applies to all Permittees and must be included in NPDES permits. Because they are regulations, they cannot be challenged in the context of an NPDES permit action. The boilerplate covers requirements such as monitoring, recording, reporting requirements, compliance responsibilities, and general requirements.

IX. OTHER LEGAL REQUIREMENTS

A. Endangered Species Act.

The Endangered Species Act requires federal agencies to consult with the National Marine Fisheries Service and the U.S. Fish and Wildlife Service if their actions could beneficially or adversely affect any threatened or endangered species. EPA has determined that issuance of this permit is not likely to adversely affect any of the threatened or endangered species in the vicinity of the discharge. See Appendix G for further details.

B. Certification.

Section 401 of the Clean Water Act requires EPA to seek certification from the Tribe that the permit is adequate to meet Tribal water quality standards before issuing the final permit. On May 21, 1999 the Tribe received approval from the Regional Administrator to administer the water quality standards program consistent with Section 303(c) of the Clean Water Act. The Clean Water Act allows for the CTWSRO to stipulate more stringent conditions in the permit, if the certification sites the Clean Water Act or Tribal law upon which that condition is based. In addition, the regulations require a certification to include statements of the extent to which each condition of the permit can be made less stringent without violating the requirements of Tribal law.

Part of the Tribe's certification is authorization of a mixing zone. Permit limits for chlorine and ammonia were developed using 25 percent of the low Creek flow. If the Tribe authorizes a different mixing zone in its final certification, EPA will recalculate the effluent limitations based on the dilution available in the final mixing zone. If the Tribe does not certify a mixing zone, EPA will recalculate the permit limitations based on meeting water quality standards at the point of

discharge (rather than at the point of discharge back-calculated from the edge of the mixing zone).

C. Interstate Waters.

The Federal Regulation found at 40 CFR 124.10(c)(1)(iii) requires the EPA to give notice of this permit action to any affected state. Notice has been given to the Oregon Department of Environmental Quality and other Oregon state agencies (as defined in this regulation) potentially impacted by this action.

D. Permit Expiration.

The permit will expire five years from the permit effective date.

REFERENCES

EPA 1991. Technical Support Document for Water Quality-based Toxics Control. Office of Water Enforcement and Permits, Office of Water Regulations and Standards. Washington, D.C., March 1991. EPA/505/2-90-001.

EPA, 1996a. EPA Region 10 Guidance For WQBELs Below Analytical Detection/Quantization Level. NPDES Permits Unit, EPA Region 10, Seattle, WA, March, 1996.

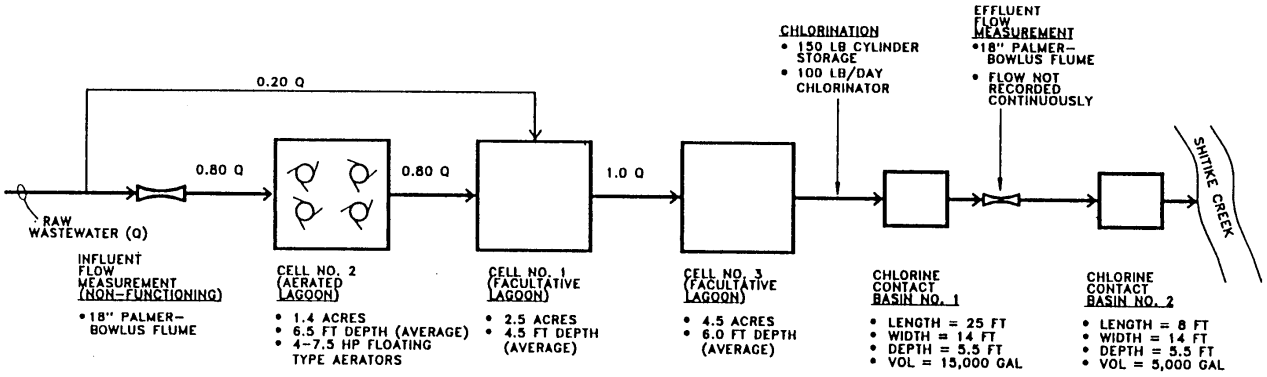
LIST OF ACRONYMS

AML	Average Monthly Limit
BMP	Best Management Practices
BOD	Biochemical Oxygen Demand
CFR	Code of Federal Regulations
cfs	Cubic feet per second
CTWSRO	Confederated Tribes of Warm Springs Reservation of Oregon
CWA	Clean Water Act
DMR	Discharge Monitoring Report
CV	Coefficient of Variation
EPA	Environmental Protection Agency
MDL	Maximum Daily Limit
mgd	Million gallons per day
mg/L	Milligrams per liter
MSWLF	Municipal Solid Waste Landfill
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
O&M	Operation and Maintenance
POTW	Publicly Owned Treatment Works
RP	Reasonable Potential
SS	Suspended Solids
TSD	Technical Support Document for Water Quality-based Toxics Control (EPA 1991)
TSS	Total Suspended Solids
Fg/L	Micrograms per liter
USFWS	United State Fish and Wildlife Service
USGS	United States Geological Survey
UV	Ultraviolet Radiation
WLA	Wasteload Allocation
WQS	Water Quality Standards
WWTP	Wastewater Treatment Plant

APPENDIX A - CTWSRO WASTEWATER TREATMENT PLANT DESCRIPTIONS AND PROCESS DIAGRAMS

I. Existing Facility

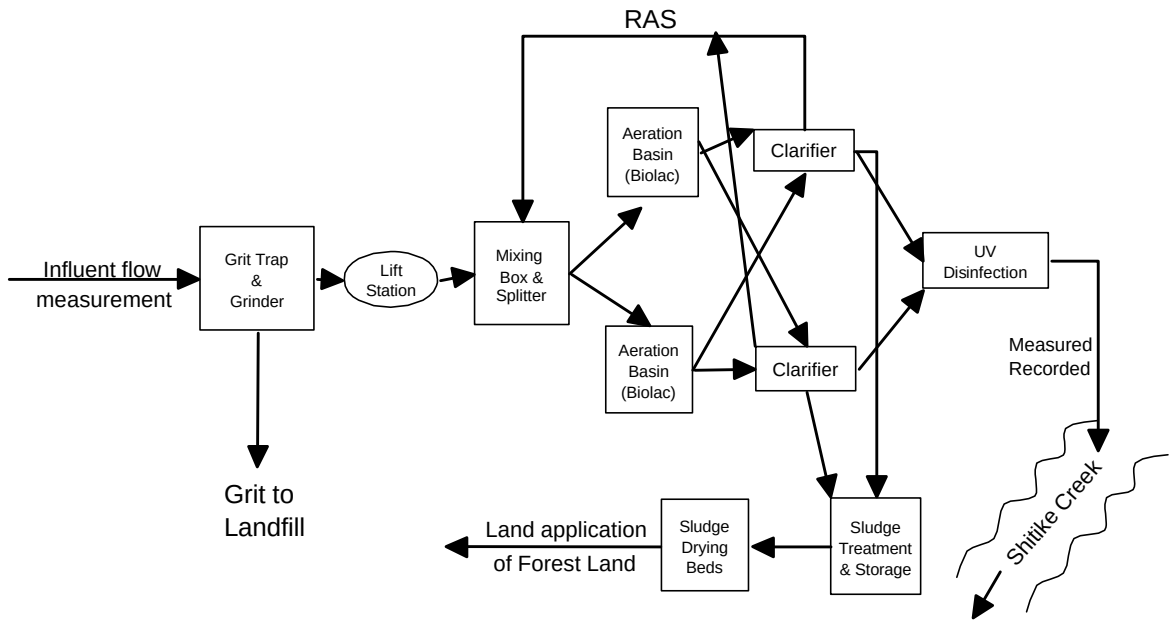
The existing Warm Springs WWTP divides eighty percent of the influent wastewater from the collection system into Cell 2 and twenty percent to Cell 1. Cell 2 is a 1.4 acre aerated lagoon equipt with four 7.5 horsepower floating aerators. Cell 1 is a 2.5 acre facultative lagoon. The aerated wastewater from Cell 2 is recombined in Cell 1 before entering Cell 3, a facultative lagoon. The effluent is then chlorinated before flowing into the 15,000 gallon chlorine contact basin and the 5,000 gallon chlorine contact basin before discharge into Shitike Creek at River Mile 1.75.



Process Diagram 1 for Existing Facility

II. Upgraded Facility

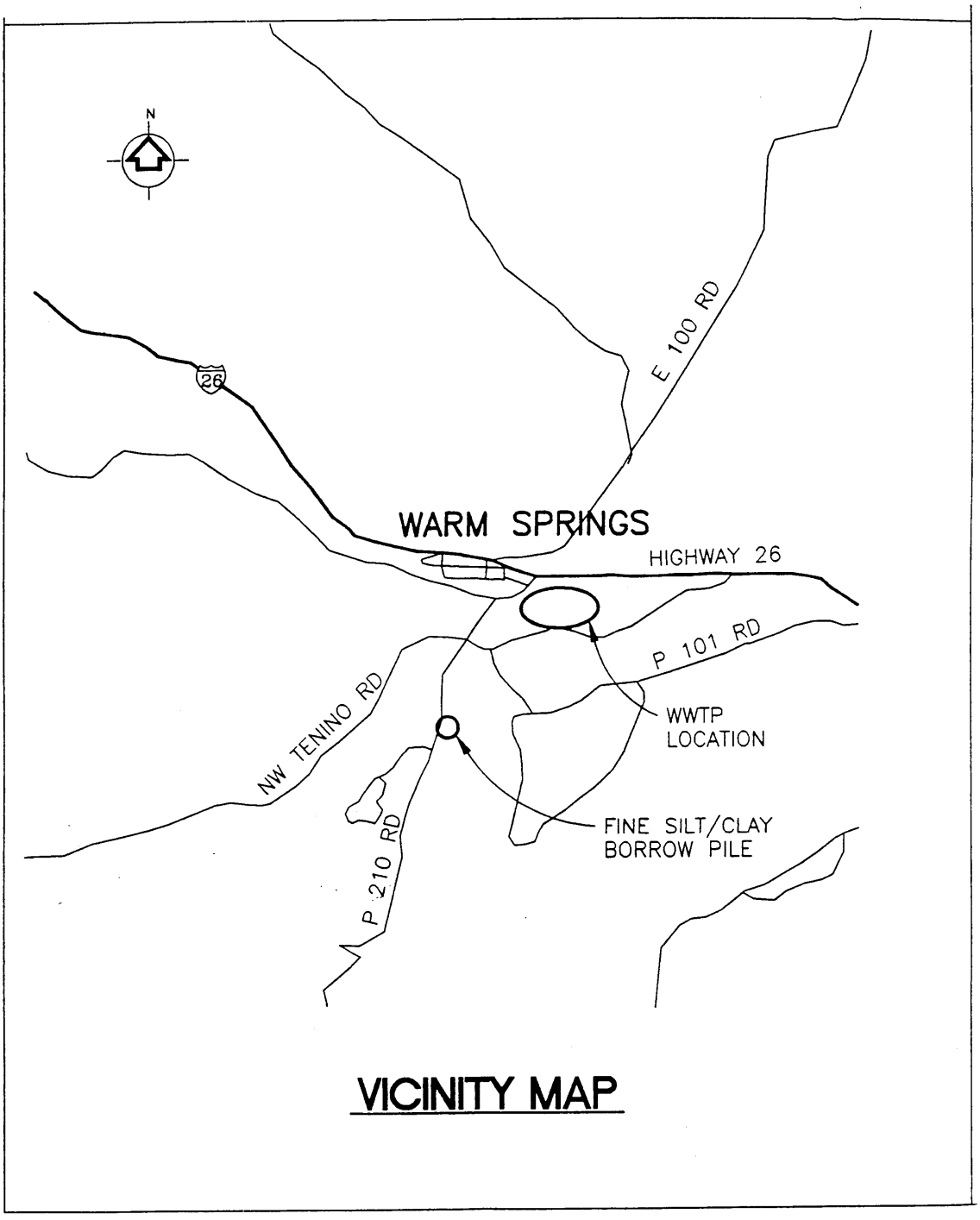
The CTWSRO is currently upgrading its WWTP. The upgrades include an influent flow meter, headworks (grit trap and grinder), lift station, mixing/splitter box, two aeration basins with Biolac systems, two clarifiers, sludge treatment/storage, ultraviolet (UV) disinfection, effluent flow meter and four drying beds. After the upgrades, wastewater from the collection system is measured before passing through a grit trap and grinder at the headworks. The lift station then pumps the wastewater to the mixing/splitter box before discharging into one of two Biolac aeration basins. The effluent then proceeds to one of two clarifiers where the solids are removed, treated, and stored. The sludge solids are dried in one of four beds before they are land applied on forest land. Finally, the wastewater from the clarifiers receive UV disinfection before being measured and discharged into Shitike Creek at River Mile 1.75.



Confederated Tribes of Warm Springs
Proposed Treatment Plant Upgrade

Process Diagram 2 for Upgraded Facility

APPENDIX B - MAP OF CTWSRO WASTEWATER TREATMENT PLANT



APPENDIX C - BASIS FOR EFFLUENT LIMITATIONS

I. Statutory and Regulatory Basis for Limits

Sections 101, 301(b), 304, 308, 401, 402, and 405 of the Clean Water Act (CWA) provide the basis for the effluent limitations and other conditions in the draft permit. The EPA evaluates discharges with respect to these sections of the CWA and the relevant NPDES regulations to determine which conditions to include in the draft permit.

In general, the EPA first determines which technology-based limits must be incorporated into the permit. EPA then evaluates the effluent quality expected to result from these controls, to see if it could result in any excedences of the water quality standards in the receiving water. If excedences could occur, EPA must include water quality-based limits in the permit. The draft permit limits reflect whichever requirements (technology-based or water quality-based) are more stringent. The limits which EPA is proposing in the draft permit are found in Section V.A of this fact sheet.

II. Technology-based Evaluation

The 1972 CWA required publicly owned treatment works (POTWs) to meet performance-based requirements based on available wastewater treatment technology. Section 301 of the CWA established a required performance level, referred to as "secondary treatment," that all POTWs were required to meet by July 1, 1977.

More specifically, Section 301(b)(1)(B) of the CWA requires that EPA develop secondary treatment standards for POTWs as defined in Section 304(d)(1) of the CWA. Based on this statutory requirement, EPA developed secondary treatment regulations, found in 40 CFR Part 133.102. These technology-based regulations apply to all municipal wastewater treatment plants and identify the minimum level of effluent quality attainable by secondary treatment in terms of BOD_5, TSS and pH. In accordance with 40 CFR 122.2, a municipality refers to a city town, borough, county, parish, district, association or Indian tribe or an authorized Indian tribal organization. Section 103 of 40 CFR 133 provides for special considerations regarding combined sewers, industrial wastes, waste stabilization ponds, and less concentrated influent wastewater for combined and separate sewers. Pursuant to Section 304(d)(4) of the CWA, the regulations also define "treatment equivalent to secondary treatment" and the alternative standards that apply to facilities meeting this definition.

The CTWSRO Water Quality Standards (WQS) include technology-based limits for BOD and suspended solids (SS) for all waters within the reservation. Section 432.200(1)(c) of the Tribe's WQS states that during periods of low stream flow, treatment is required that results in meeting monthly average concentrations of 10 mg/L of BOD and SS. This regulation also requires that during periods of high stream flow, a minimum of secondary treatment or equivalent control be used unless otherwise specifically authorized by the Tribe. The operation of all waste treatment and control facilities must be at maximum practicable efficiency and effectiveness so as to minimize waste discharges to public waters.

III. Water Quality-based Evaluation

In addition to technology-based limits, EPA evaluated the discharge to determine compliance with Section 301(b)(1)(C) of the CWA. This section requires the establishment of limitations in permits necessary to meet WQS by July 1, 1977. Discharges to waters of the United States must also comply with limitations imposed by the Tribe as part of its certification of NPDES permits under section 401 of the CWA.

The NPDES regulation at 40 CFR 122.44(d)(1) requires that permits include limits for all pollutants or parameters which "are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any Tribal/federal water quality standard, including the Tribes narrative criteria for water quality." The limits must be stringent enough to ensure that water quality standards are met, and must be consistent with any available wasteload allocation (WLA).

The CTWSRO WQS contain water quality criteria for bacteria (E. coli) and incorporates by reference the EPA Quality Criteria for Water (1986) which includes criteria for chlorine and ammonia.

In determining whether water quality-based limits are needed and when developing those limits when necessary, EPA uses the approach outlined below:

1. Determine the appropriate water quality criteria (from Tribes WQS)
2. Determine whether there is "reasonable potential" to exceed the criteria
3. If there is reasonable potential to exceed the criteria, then develop a WLA
4. Develop effluent limitations, based on WLAs

The following sections below provide a detailed discussion of each step. Appendix D contains calculations for chlorine and ammonia to illustrate how these steps are implemented.

A. Determine Water Quality Criteria

The first step in developing water quality-based limits is to determine the applicable water quality criteria. The applicable criteria are determined based on the beneficial uses of the receiving water as identified in Section III of the Fact Sheet. For any given pollutant, different uses may have different criteria. To protect all beneficial uses, "reasonable potential" and the permit limits are based on the most stringent of the water quality criteria applicable to those uses. The criteria applicable to the CTWSRO wastewater discharge are found in Sections 1 through 5 below.

1.

TABLE C - 1 Criteria for the protection of cold water biota			
Parameter	**Aquatic Life Criteria[1]**		**Human Health Criteria**
	Acute criteria	**Chronic criteria**	
Chlorine (µg/L)	19	11	NA
Ammonia[1] (Fg/L)	2710	520	NA

Note:
1. The ammonia criteria is dependent on pH and temperature. The 95th percentile data collected upstream of the facility between December 1995 and July 1996 was used to determine the appropriate criteria. The 95th percentile of temperature and pH is 16EC and 8.44 standard units respectively.

2. pH values must be within the range of 6.5 - 9.5.

3. E. coli shall not exceed a 30-day log mean of 126 organisms per 100 ml, based on a minimum of five samples and no single sample shall exceed 406 organisms per 100 ml.

4. Surface waters shall be free from floating, suspended or submerged materials.

B. Reasonable Potential Evaluation

To determine if there is "reasonable potential" to cause or contribute to an excedence of the water quality criteria for a given pollutant, the EPA compares applicable water quality criteria to the maximum expected receiving water concentrations for a particular pollutant. If the expected receiving water concentration exceeds the criteria, there is reasonable potential and a water quality-based effluent limit must be included in the permit.

EPA used the recommendations in Chapter 3 of the *Technical Support Document for Water Quality-based Toxics Control* (TSD, EPA 1991) to conduct the reasonable potential analysis for the CTWSRO WWTP.

The maximum expected receiving water concentration C_d is determined using the following mass balance equation:

$$C_d \times Q_d = (C_e \times Q_e) + (C_u \times Q_u) \quad \text{or}$$

$$C_d = \frac{(C_e \times Q_e) + (C_u \times Q_u)}{Q_d}$$

where,
C_d = receiving water concentration downstream of the effluent discharge

C_e = maximum projected effluent concentration
= maximum reported effluent value X reasonable potential multiplier
Q_e = maximum effluent flow
C_u = upstream concentration of pollutant
Q_d = receiving water flow downstream of the effluent discharge
= $Q_e + Q_u$
Q_u = upstream flow
= upstream flow X %MZ (if a mixing zone is available)

Sections 1 through 4 below discuss each of the factors used in the mass balance equation to calculate C_d. Section 5 presents the reasonable potential calculations for the CTWSRO discharge.

1. Effluent Concentration

The maximum projected effluent concentration (C_e) in the mass balance equation is represented by the 99th percentile, calculated using the statistical approach recommended in the TSD. The 99th percentile effluent concentration is calculated by multiplying the maximum reported effluent concentration by a reasonable potential multiplier. The reasonable potential multiplier accounts for uncertainty in the data. The multiplier decreases as the number of data points increases and variability of the data decreases. Variability is measured by the coefficient of variation (CV) of the data. When there are not enough data to reliably determine a CV, the TSD recommends using 0.6 as a default value. A partial listing of reasonable potential multipliers can be found in Table 3-1 of the TSD. EPA evaluated the CTWSRO permit application and available monitoring data to determine the maximum reported effluent concentrations. See Table C-2 in section 5, below, for a summary of maximum reported effluent concentrations, reasonable potential multipliers, and maximum projected effluent concentrations.

2. Effluent Flow

The effluent flow used in the equation is the design flow of the facility. The design flow of 0.372 mgd (0.577 cfs) was used to calculate the interim permit limits and a design flow of 0.87 mgd (1.35 cfs) was used to calculate the limits that apply five years from the effective date of the permit.

3. Upstream (Ambient) Concentration

The ambient concentration in the mass balance equation is based on a reasonable worst-case estimate of the pollutant concentration upstream from the discharge. For criteria that are expressed as maxima (for example ammonia), the 95th percentile of the ambient data is generally used as an estimate of worst-case. For criteria that are expressed as

minima (for example, dissolved oxygen) the 5th percentile of the ambient data is generally used as an estimate of worst-case. Ambient data was unavailable for chlorine, ammonia, and E. coli, therefore zero concentration was used in the mass balance equations.

4. Upstream Flow

Under the Tribe's water quality standards, dischargers are generally not authorized to use the entire upstream flow for dilution of their effluent. A mixing zone of 25 percent of the volume of the stream flow was used for determining compliance with chronic and acute criteria for total ammonia and total residual chlorine because the Tribe's WQS require that mixing zones "be as small as feasible."

The 1Q10[1] and 7Q10[2] flows are 31.0 cfs and 33.0 cfs, respectively. Based on the above standards, twenty five percent of these flows (7.75 and 8.25 cfs, respectively) were used in the mass balance equations for chlorine and ammonia to determine whether there was reasonable potential to cause excedences of the acute and chronic criteria.

In accordance with Section 432.100(4)(c) of the CTWSRO WQS, only the Tribe may authorize mixing zones within the reservation. If the CTWSRO authorizes a different size mixing zone in its 401 certification, EPA will recalculate the effluent limits based on the final mixing zone. If the Tribe does not authorize a mixing zone in its 401 certification, EPA will recalculate the permit limits based on meeting water quality standards at the point of discharge.

5. "Reasonable Potential" Calculation

Table C-2 summarizes the data, multipliers, and criteria used to determine "reasonable potential" to exceed criteria. Section IV, below, provides a detailed discussion of the development of water quality-based effluent limitations for specific pollutants.

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[1] The 1-day, 10-year low flow is the 1-day low flow that has a 10 percent chance of occurring in any given year. The 1Q10 was calculated based on the Log Pearson Type III distribution using United States Geological Survey (USGS) data (Station # 14093000) from 1913 through 1974.

[2] The 7-day, 10-year low flow is the 7-day average low flow that has a 10 percent chance of occurring in any given year. The 7Q10 was calculated based on the Log Pearson Type III distribution using United States Geological Survey (USGS) data (station # 14093000) from 1913 through 1974.

TABLE C-2: Reasonable Potential Calculations							
Parameter	**Max. Reported Effluent Conc.**	**CV**	**RP Multiplier**	**Max. Projected Effluent Conc (C_e)**	**Upstrm Conc (C_u)**	**Projected Downstrm Conc. (C_d)**	**Most Stringent Criterion**
Total Ammonia as N, Fg/L[1/2]	5,400	1.4	6.2	33,480	0	2,189 before upgrade 4,967[3] after upgrade	2,710
Total Residual Chlorine, Fg/L[1]	1,000	0.6	4.2	4,200	0	291[3]	19

Notes:
1 A mixing zone of 25% of the Spokane River flow was assumed.
2 The CV was calculated using all available effluent data (14 data points) collected from November 1997 through February 1998.
3 Maximum projected ambient concentration indicates "reasonable potential" to exceed water quality standards.

C. Wasteload Allocation Development

Once EPA has determined that a water quality-based limit is required for a pollutant, the first step in developing a permit limit is development of a WLA for the pollutant. A WLA is the concentration (or loading) of a pollutant that the permittee may discharge without causing or contributing to an excedence of WQS in the receiving water. The WLAs were calculated based on a mixing zone for ammonia and chlorine and based on meeting water quality criteria at "end-of-pipe" for E. coli and pH.

1. Mixing zone-based WLA

Where the Tribe authorizes a mixing zone for the discharge (according to Section 432.100(4)(c)), the WLA is calculated as a mass balance, based on the available dilution, background concentrations of the pollutant(s) and the water quality criteria. The mass balance equation is the same as that used to calculate reasonable potential, with the acute or chronic criterion substituted for C_d and the WLA substituted for C_e.

Because acute aquatic life and chronic aquatic life apply over different time frames and may have different mixing zones, it is not possible to compare them directly to determine which criterion results in the most stringent limits. The acute criteria are applied as a one-hour average and have a smaller mixing zone, while the chronic criteria are applied as a four-day average and have a larger mixing zone. To allow for comparison, the acute and chronic WLAs are is statistically converted to a long-term average WLAs. The most stringent long-term average WLA is used to calculate the permit limits.

2. "End-of-Pipe" WLA

In some cases, there is no dilution available, either because the receiving water exceeds the criteria or because the tribe has decided not to authorize a mixing zone for a particular pollutant. When there is no dilution, the criterion becomes the WLA. Establishing the criterion as the WLA ensures that the permittee does not contribute to an excedence of the criteria. As with the mixing-zone based WLA, the acute and chronic criteria must be converted to long-term averages and compared to determine which one is more stringent. The more stringent WLA is then used to develop permit limits.

D. Permit Limit Derivation

Once the WLA has been developed, EPA applies the statistical permit limit derivation approach described in Chapter 5 of the TSD to obtain daily maximum and monthly average permit limits. This approach takes into account effluent variability (through the CV), sampling frequency, and the difference in time frames between the monthly average and daily maximum limits.

The daily maximum limit is based on the CV of the data and the probability basis, while the monthly average limit is dependent on these two variables and the monitoring frequency. As recommended in the TSD, EPA used a probability basis of 95 percent for monthly average limit calculation and 99 percent for the daily maximum limit calculation. As with the reasonable potential calculation, when there were not enough data to calculate a CV, EPA assumed a CV of 0.6 for both monthly average and daily maximum calculations.

E. Antidegradation

In addition to water quality-based limitations for pollutants that could cause or contribute to excedences of numeric or narrative criteria, EPA must consider the Tribe's antidegradation policy (Section 432.020). This policy is designed to protect existing water quality when the existing quality is better than that required to meet the standard and to prevent water quality from being degraded below the standard when existing quality just meets the standard. For high quality waters, antidegradation requires that the Tribe find that allowing lower water quality is necessary to accommodate important economic or social development before any degradation is authorized. This means that, if water quality is better than necessary to meet the water quality standards, increased permit limits can be authorized only if they do not cause degradation or if the Tribe makes the determination that it is necessary. Because the limits in the draft permit are protective of the Shitike Creek's designated uses, the draft permit complies with the Tribe's antidegradation policy.

IV. Effluent Limitations

This discussion outlines the basis for each of the effluent limitations in the CTWSRO WWTP draft NPDES permit. The limitations are either based on technology or the CTWSRO WQS.

A. Biochemical Oxygen Demand and Total Suspended Solids

The existing WWTP is a POTW subject to the technology-based requirements for BOD_5 and TSS in Federal Regulation, 40 CFR 133.103(c) for waste stabilization ponds, and 40 CFR 133.105(a) as outlined in Table C-3.

Table C-3: Equivalent to Secondary Treatment Requirements

Parameter	Monthly Average (mg/L)	Weekly Average (mg/L)	Percent Removal (%)
BOD_5	45	65	65
TSS	45	65	65

In addition to the interim concentration limits, 40 CFR 122.45(f) requires that NPDES permits contain mass-based limits for such pollutants as BOD_5 and TSS. The draft permit establishes loading limits based on the WWTPs current design capacity of 0.372 mgd (40 CFR 122.45(b)). The limits are calculated by multiplying the concentration limits by the design flow and a conversion factor of 8.34 pound•liter/milligram•million gallons, as shown below:

Monthly Average Load: = (0.372 mgd)(45 mg/L)(8.34)
= **140 lbs/day**

Weekly Average Load: = (0.372 mgd)(65 mg/L)(8.34)
= **202 lbs/day**

Five years from the effective date of the permit (when the WWTP has completed upgrading), the BOD_5 and TSS CTWSRO WQS (found in Section 432.200(1)(c)) apply. The draft permit also establishes loading limits based on the WWTPs future design capacity of 0.870 mgd. The future limits are outlined in Table C-4 below:

Table C-4: CTWSRO Water Quality Standards			
Parameter	**Average Monthly Limit**	**Average Weekly Limit**	**Percent Removal**
BOD_5			
April 1-October 31	10 mg/L 73 lbs/day	15 mg/L 109 lbs/day	85%
November 1-March 31	30 mg/L 218 lbs/day	45 mg/L 327 lbs/day	85%
TSS			
April 1-October 31	10 mg/L 73 lbs/day	15 mg/L 109 lbs/day	85%
November 1-March 31	30 mg/L 218 lbs/day	45 mg/L 327 lbs/day	85%

B. pH

In addition to limits on BOD_5 and TSS, 40 CFR 133.102 specifies a pH range from 6.0 to 9.0 standard units for POTWs. However Section 432.100(2)(d) of the Tribe's WQS for protection of aquatic requires that ambient pH be within the range of 6.5 - 8.5 standard units. Therefore, the draft permit incorporates the more stringent water quality-based requirements.

C. E. coli Bacteria

When establishing E. coli limits in the draft permit, EPA used Section 432.100(2)(e) of the Tribe's WQS. The standard requires that E. coli be less than 126 organisms per 100 ml over a 30-day log mean, based on a minimum of five (5) samples and that no E. coli sample exceed 406 organisms per 100 ml.

D. Total Residual Chlorine

Table 3 of the Tribe's WQS includes total residual chlorine criteria for the protection of aquatic life. The criteria is 19 µg/L measured as a one-hour average concentration and 11 µg/L measured as a four-day average concentration. These criteria were converted to a daily maximum limit of 272 Fg/L and a monthly average limit of 140 Fg/L. Appendix D contains the permit limit calculations.

E. Total Ammonia (as N)

Low concentrations of ammonia can be toxic to freshwater fish, particularly salmonids. Un-ionized ammonia (NH_3) is the principal toxic form of ammonia. The ammonium ion (NH_4^+) is much less toxic. The relative percentages of these two forms of ammonia in the water vary as the temperature and pH vary. As the

pH and temperature increase, the percentage of ammonia that is in the un-ionized form increases, causing increased toxicity.

As effluent mixes with receiving water, the temperature and pH change, making it difficult to predict how much of the total ammonia in the discharge will convert to the un-ionized form. Therefore, the limits in the draft permit are expressed as total ammonia, not un-ionized ammonia.

Because the toxicity of ammonia is dependent upon pH and temperature, the criteria are also pH and temperature dependent. EPA calculated the total ammonia criteria using 95th percentile ambient pH (8.44 standard units) and temperature values (16 EC). Based on this analysis, the acute and chronic criteria for the protection of cold water biota and salmonid spawning (Table 3 WQ criteria standards) are 2710 Fg/L and 520 Fg/L, respectively. Using the statistical permit derivation method in the TSD, EPA calculated daily maximum and monthly average limits of 6.8 mg/L (49.3 lbs/day) and 2.4 mg/L (17.4 lbs/day), that apply after the upgrades to the system. Appendix D contains the permit limit calculations.

F. Floating, Suspended or Submerged Matter

Section 432.100(4) of the Tribe's WQS requires surface waters of the State to be free from floating, suspended, or submerged matter of any kind in concentrations causing nuisance or objectionable conditions or that may impair designated beneficial uses.

APPENDIX D - EXAMPLE EFFLUENT LIMIT CALCULATION FOR TOTAL RESIDUAL CHLORINE AND TOTAL AMMONIA

The following calculations for total residual chlorine and total ammonia were performed according to procedures outlined in Chapter 5 of the *Technical Support Document for Water Quality-Based Toxics Control* (EPA/505/2-90-001, March 1991). Although a mixing zone was used in the derivation of the permit limits, the procedure translates to end-of -pipe effluent limits.

In calculating water quality-based limits, EPA used the following assumptions:

1Q10 = 31 cfs
7Q10 = 33 cfs
Mixing zone = 25% of Shitike Creek

Step 1 - Determine the appropriate water quality criteria

The water quality criteria is determined based on the use of the receiving water. Shitike Creek is protected for industrial water supply; salmonid fish rearing, resident fish and aquatic life; wildlife and hunting; fishing; and water contact recreation. The Tribe's WQS require that water protected for aquatic life not exceed 19.0 Fg/L measured as one-hour (acute) average concentration and 11.0 Fg/L measured as a four-day (chronic) average concentration for total residual chlorine and 2,710 Fg/L measured as a one-hour average and 520 Fg/L measured as a four day average for total ammonia.

Step 2 - Determine whether there is "reasonable potential" to exceed the criteria

There is RP to exceed water quality criteria if the maximum projected concentration of the pollutant at the edge of the mixing zone exceeds the criterion. The maximum projected concentration is calculated from the following equation:

$$C_d = \frac{(C_e \text{ X } Q_e) + (C_u \text{ X } (Q_u \text{ X } \%MZ))}{Q_e + (Q_u \text{ X } \%MZ)}$$

where,

C_d = receiving water concentration downstream of the effluent discharge
C_e = maximum projected effluent concentration
= maximum reported effluent concentration X reasonable potential multiplier
= 33,480 Fg/L for total ammonia
= 4,200 Fg/L for total residual chlorine
Q_e = maximum effluent flow (0.577 cfs before upgrades and 1.35 cfs after upgrades)
C_u = upstream concentration of pollutant (0 Fg/L)
Q_u = upstream flow (1Q10 for acute and 7Q10 for chronic)

$C_{d\text{-acute-ammonia-before upgrades}}$ = 2,189 Fg/L < 2,710 Fg/L
$C_{d\text{-acute-ammonia-after upgrades}}$ = 4,967 Fg/L > 2,710 Fg/L
$C_{d\text{-chronic-ammonia-before upgrades}}$ = 149 Fg/L < 520 Fg/L
$C_{d\text{-chronic-ammonia-after upgrades}}$ = 4,708 Fg/L > 520 Fg/L
$C_{d\text{-acute-chlorine}}$ = 291 Fg/L > 19 Fg/L

There is reasonable potential to violate the acute chlorine criteria as well as the acute ammonia criteria (after the WWTP is upgraded), therefore limits must be included in the permit.

Step 3 - Calculate Wasteload Allocations

Acute and chronic waste load allocations (WLA_{acute} or $WLA_{chronic}$) are calculated using the same mass balance equation used to calculate the concentration of the pollutant at the edge of the mixing zone. However, C_d becomes the criterion and C_e is replaced by the WLA_{acute} or $WLA_{chronic}$. The WLAs define the appropriate concentration of pollutant allowed in the effluent.

$$WLA = \frac{C_d(Q_u \text{ X } \%MZ) + (C_d Q_e)}{Q_e} - \frac{Q_u C_u (\%MZ)}{Q_e}$$

$WLA_{acute\text{-}chlorine}$ = 274 Fg/L
$WLA_{chronic\text{-}chlorine}$ = 168 Fg/L
$WLA_{acute\text{-}ammonia\text{-}upgraded}$ = 18,268 Fg/L
$WLA_{chronic\text{-}ammonia\text{-}upgraded}$ = 3,698 Fg/L

Step 4 -Develop Permit Limits

a. Convert the WLAs to Long Term Averages (LTAs)
The acute and chronic WLAs are then converted to Long Term Average concentrations (LTA_a and LTA_c) using the following equations from Section 5.4 of EPA's TSD:

$LTA_{acute} = WLA_{acute} \text{ X } e^{[0.5F^2 - zF]}$ where,

F² = ln(CV² + 1)
= 0.307 for chlorine
= 1.09 for ammonia
z = 2.326 for 99th percentile probability basis
CV = coefficient of variation = standard deviation/mean;
= 0.6 for chlorine
= 1.4 for ammonia

$LTA_{acute\text{-}chlorine}$ = 241 Fg/L
$LTA_{acute\text{-}ammonia\text{-}upgraded}$ = 2,774 µg/L

$LTA_{chronic} = WLA_{chronic} \text{ X } e^{[0.5F^2 - zF]}$ where,

F² = ln(CV²/4 + 1)
= 0.09 for chlorine
= 0.40 for ammonia
z = 2.326 for 99th percentile probability basis
CV = 0.6 for chlorine
= 1.4 for ammonia

$LTA_{chronic\text{-}chlorine}$ = 87.4 Fg/L

$LTA_{chronic\text{-}ammonia\text{-}upgraded}$ = 1,039 µg/L

b. Calculate Average Monthly and Maximum Daily Permit Limits

To protect a waterbody from both acute and chronic effects, the more limiting of the calculated LTA_{acute} and $LTA_{chronic}$ is used to derive the effluent limitations. The TSD recommends using the 95th percentile for the Average Monthly Limit (AML) and the 99th percentile for the Maximum Daily Limit (MDL).

The MDL and the AML would be calculated as follows:

$MDL = LTA_{chronic} \times e^{[zF-0.5F^2]}$ where,

F^2 = $\ln(CV^2 + 1)$
= 0.307 for chlorine
= 1.09 for ammonia
z = 2.326 for 99th percentile probability basis

$MDL_{chlorine}$ = **272 µg/L**
$MDL_{ammonia\text{-}upgraded}$ = **6,832 µg/L**

$AML = LTA_{chronic} \times e^{[zF- 0.5F^2]}$ where,

F^2 = $\ln(CV^2/n + 1)$
= 0.10 for chlorine
= 0.40 for ammonia
n = number of sampling events required per month for chlorine = 20
n = number of sampling events required per month for ammonia = 4
z = 1.645 for 95th percentile probability basis

$AML_{chlorine}$ = **140 µg/L**
$AML_{ammonia\text{-}upgraded}$ = **2,408 µg/L**

APPENDIX E - ENDANGERED SPECIES ACT

In a letter dated January 14, 1999, the National Marine Fisheries Service (NMFS) indicated there are not any listed anadromous fish species present in either the Deschutes River or Shitike Creek. However, the following two anadromous fish species may occur in the near action area:

LISTED SPECIES	
Snake River fall chinook salmon	*Oncorhynchus tshawytscha*
Middle Columbia steelhead	*Orcorhynchus mykiss*

In a letter dated December 1, 1998 and during follow-up conversations the US Fish and Wildlife Service (USFWS) identified the following federally-listed and proposed endangered and threatened species that may occur within the Confederated Tribes of Warm Springs NPDES permit area.

LISTED SPECIES		
Bald Eagle	*Haliaeetus leucocephalus*	T
Northern spotted owl	*Strix occidentalis caurina*	CH-T
Fall Chinook salmon (Snake River runs)	*Oncorhynchus tshawytscha*	PCH
Bull trout	*Salvelinus confluentus*	
Middle Columbia River Steelhead	*Oncorhynchus mykiss*	T
PROPOSED SPECIES		
Canada lynx	*Lynx canadensis*	PT

(T) - Listed Threatened *(CH) - Critical Habitat has been designated for this species*
(PT) - Proposed Threatened *(PCH) - Critical Habitat has been proposed for this species.*

The fall chinook salmon, bull trout, and middle Columbia steelhead are not expected to be effected by the WWTP discharge because adequate dilution is available in Shitike Creek (average flow is 30-40 cfs) while the upgraded WWTP will only have a maximum design flow of 0.870 cfs. The limits in the draft permit for the upgraded facility are as stringent or more so than the state of Idaho's for pH, BOD, TSS, chlorine, ammonia, E. coli. In addition, the fall chinook salmon do not use Shitike Creek for spawning or rearing. The activities responsible for the decline of the steelhead include logging, recreational fishing, predation by marine mammals, birds, and native and non-native fish species, adverse environmental conditions resulting from natural factors such as droughts, floods, and poor ocean conditions, non-point and point source pollution caused by agriculture and urban development, disease outbreaks by hatchery introduction and warm water temperature, unscreened irrigation inlets, loss and alteration of estuaries, and loss of habitat by dam construction.

The issuance of the permit will not involve the removal of any large trees, therefore permit issuance will not affect the habitat of, or disturb the nesting or perch activities of either the Bald eagle or the northern spotted owl. The permit does not effect the Canada lynx because the permit authorizes discharge of effluent to Shitike Creek. The eagle, owl and lynx have not been spotted in the Warm Springs Agency area nor is the habitat conducive to likely habitance.

The EPA is in the process of informal consultation with the NMFS and USFWS. EPA has made the finding that the discharge from the Warm Springs WWTP is *not likely to adversely affect* the above listed and proposed species.