Region 10, NPDES Permits Unit
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Seattle, WA 98101

Fact Sheet

Public Comment Start Date: October 28, 2011
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Proposed Reissuance of a National Pollutant Discharge Elimination System (NPDES) Permit to Discharge Pollutants Pursuant to the Provisions of the Clean Water Act (CWA)

City of Plummer
Wastewater Treatment Plant

EPA Proposes To Reissue NPDES Permit
EPA proposes to reissue an NPDES permit for the facility referenced above. The draft permit places conditions on the discharge of pollutants from the wastewater treatment plant to waters of the United States. 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 from the facility.

This Fact Sheet includes:
- information on public comment, public hearing, and appeal procedures
- a listing of proposed effluent limitations and other conditions for the facility
- a map and description of the discharge location
- technical material supporting the conditions in the permit

Public Comment
Persons wishing to comment on, or request a Public Hearing for the draft permit for this facility may do so in writing by the expiration date of the Public Comment period. A request for a Public Hearing must state the nature of the issues to be raised as well as the requester's name, address and telephone number. All comments and requests for Public Hearings must be in writing and should be submitted to EPA as described in the Public Comments Section of the attached Public Notice.

After the Public Notice expires, and all comments have been considered, EPA's regional Director for the Office of Water and Watersheds 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 substantive comments

are received, EPA will address the comments and issue the permit. The permit will become effective no less than 30 days after the issuance date, unless an appeal is submitted to the Environmental Appeals Board 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 Regional Office in Seattle between 8:30 a.m. and 4:00 p.m., Monday through Friday at the address below. The draft permits, fact sheet, and other information can also be found by visiting the Region 10 NPDES website at "http://epa.gov/r10earth/waterpermits.htm."

United States Environmental Protection Agency
Region 10
1200 Sixth Avenue, OWW-130
Seattle, Washington 98101
(206) 553-0523 or
Toll Free 1-800-424-4372 (within Alaska, Idaho, Oregon and Washington)

The fact sheet and draft permits are also available at:

US EPA Region 10
1435 N. Orchard
Boise, ID 83706
(208) 378-5746

Plummer Public Library
800 D St
Plummer, ID 83851
(208) 686-1812

Table of Contents

Acronyms

1Q10	1 day, 10 year low flow
7Q10	7 day, 10 year low flow
30Q10	30 day, 10 year low flow
30B3	Biologically-based design flow intended to ensure an excursion frequency of less than once every three years, for a 30-day average flow.
AML	Average Monthly Limit
AWL	Average Weekly Limit
BOD_5	Biochemical oxygen demand, five-day
BMP	Best Management Practices
ºC	Degrees Celsius
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
CV	Coefficient of Variation
CWA	Clean Water Act
DMR	Discharge Monitoring Report
DO	Dissolved oxygen
EFH	Essential Fish Habitat
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
IDEQ	Idaho Department of Environmental Quality
I/I	Infiltration and Inflow
lbs/day	Pounds per day
LTA	Long Term Average
mg/L	Milligrams per liter
ML	Minimum Level
µg/L	Micrograms per liter
mgd	Million gallons per day
MDL	Maximum Daily Limit or Method Detection Limit
N	Nitrogen
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System

OWW	Office of Water and Watersheds
O&M	Operations and maintenance
POTW	Publicly owned treatment works
QAP	Quality assurance plan
RP	Reasonable Potential
RPM	Reasonable Potential Multiplier
RWC	Receiving Water Concentration
SS	Suspended Solids
s.u.	Standard Units
TKN	Total Kjeldahl Nitrogen
TMDL	Total Maximum Daily Load
TRC	Total Residual Chlorine
TSD	Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001)
TSS	Total suspended solids
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
WQBEL	Water quality-based effluent limit
WQS	Water Quality Standards
WWTP	Wastewater treatment plant

I. Applicant

A. General Information

This fact sheet provides information on the draft NPDES permit for the following entity:

City of Plummer
Wastewater Treatment Plant

Physical Location:
Totely Road
SE ¼ SE ¼ Section 7, Range 4 west, township 46 north
Plummer, Idaho

Mailing Address:
P.O. Box B
Plummer, ID 83851

Contact: Melanie Meagher, City Clerk

II. Facility Information

A. Treatment Plant Description

The City of Plummer owns, operates, and has maintenance responsibility for a wastewater treatment facility which treats domestic sewage from local residents and commercial establishments. According to the permit application, no industrial wastewater discharges are collected and none are anticipated to connect to the City's wastewater system. The facility is a publicly owned treatment works (POTW) as that term is defined in federal regulations (40 CFR 403.3).

The facility provides advanced treatment of wastewater using an extended aeration activated sludge process with an anaerobic tank and fermenter for biological phosphorus removal. After the wastewater undergoes biological treatment, additional phosphorus removal is provided by ferric sulfate addition and filtration. The facility uses ultraviolet disinfection. Waste sludge is dewatered using belt filter presses.

The design flow of the POTW is 0.32 million gallons per day (mgd), or 0.495 cubic feet per second (CFS).

B. Background Information

The City of Plummer's prior permit was issued on July 7th, 2005, became effective September 1st 2005, and expired on August 31st, 2010. EPA received a timely and complete application for renewal of the 2005 permit on January 12, 2009. Therefore, the 2005 permit has been administratively continued and remains fully effective and enforceable until a new permit can be issued (40 CFR 122.6).

The prior permit authorized discharges from the City's aerated lagoon wastewater treatment plant. The lagoon wastewater treatment plant has since been decommissioned and replaced with

the new extended aeration activated sludge wastewater treatment plant described above. The proposed permit would authorize discharges from the new wastewater treatment plant through a new outfall.

III. Receiving Water

This facility discharges to Plummer Creek, within the exterior boundaries of the Coeur d'Alene Tribe Indian Reservation. Plummer Creek flows into Lake Chatcolet which is a part of Lake Coeur d'Alene.

A. Low Flow Conditions

Appendix D to the *Technical Support Document for Water Quality-Based Toxics Control* (hereinafter referred to as the TSD) (EPA 1991) and Section 12, paragraph 2 of the Coeur d'Alene Tribe's Water Quality Standards (WQS) recommend the flow conditions for use in calculating water quality-based effluent limits (WQBELs) using steady-state modeling. The TSD and the WQS state that WQBELs intended to protect aquatic life uses should be based on the lowest seven-day average flow rate expected to occur once every ten years (7Q10) for chronic criteria and the lowest one-day average flow rate expected to occur once every ten years (1Q10) for acute criteria. Because the chronic criterion for ammonia is a 30-day average concentration not to be exceeded more than once every three years, the 30B3 should be used for the chronic ammonia criterion instead of the 7Q10. The 30B3 is a biologically-based flow rate designed to ensure an excursion frequency of no more than once every three years for a 30-day average flow rate. For human health criteria, the Coeur d'Alene Tribe's water quality standards require the use of the 30Q5 flow rate for non-carcinogens, and the harmonic mean flow rate for carcinogens.

Flow data collected by the Coeur d'Alene Tribe for Plummer Creek upstream from the point of discharge shows that Plummer Creek sometimes has zero flow, or flows that are too low to measure. According to the permit application, the critical low flow rate of the receiving water is zero.

Flow information from the United States Geological Survey (USGS) was used to determine the flow conditions for Plummer Creek near its mouth (several miles downstream from the outfall). USGS gauging station number12415250 (Plummer Creek near Plummer, Idaho) has flow data from 1991 through 1992 and is now inactive. Because of the limited monitoring data, EPA calculated the design flows using a correlation between the Plummer Creek flow data and a nearby station with a long-term record (USGS 12415350 Wolf Lodge Creek near Coeur D'Alene Idaho). The 1Q10, 7Q10, 30B3, 30Q5, and harmonic mean flow rates of Plummer Creek near its mouth are 0.18, 0.20, 0.23, 0.24, and 0.89 CFS, respectively.

B. Water Quality Standards

Overview

Federal regulations at 40 CFR 122.4(d) require that the conditions in NPDES permits ensure compliance with the water quality standards of all affected States. A State or Tribe's water quality standards are composed of use classifications, numeric and/or narrative water quality criteria, and an anti-degradation policy. The use classification system designates the beneficial

uses (such as drinking water supply, contact recreation, and aquatic life) that each water body is expected to achieve. The numeric and/or narrative water quality criteria are the criteria deemed necessary by the State or Tribe to support the beneficial use classification of each water body. The anti-degradation policy represents a three-tiered approach to maintain and protect various levels of water quality and uses.

Tribal Water Quality Standards

In 1987, Congress amended the CWA to add Section 518 which allows the Administrator of EPA to treat a Tribe in the same manner as a State (*i.e.*, commonly referred to as "treatment as a State" (TAS)) for purposes of various CWA provisions (*e.g.*, implementing the water quality standards program and developing water quality standards for CWA purposes) provided the Tribe meets certain eligibility criteria. EPA's implementing regulations at 40 CFR 131.8 contain the criteria in Section 518 of the CWA that Tribes must meet in order to be eligible to administer a water quality standards program. The regulation at 40 CFR 131.8 also establishes procedures for the EPA Regional Administrator to receive and make determinations on Tribal applications.

This facility discharges to Plummer Creek (HUC 17010304), within the exterior boundaries of the Coeur d'Alene Indian Reservation. The Coeur d'Alene Tribe has TAS for the St. Joe River and the portion of Lake Coeur d'Alene that is within the boundaries of the Reservation, excluding Lake Chatcolet. In addition, the Coeur d'Alene Tribe has submitted to EPA for approval water quality standards for TAS waters only. The WQS for TAS waters, which have been submitted to EPA for approval, are referred to as "TAS WQS" in this fact sheet. At this time, EPA has not taken an approval or disapproval action on these water quality standards. All of the TAS waters are located downstream of the facility's discharge point.

With regard to the discharge point, the Coeur d'Alene Tribe does not have TAS for Plummer Creek or Lake Chatcolet, and there are no EPA-approved water quality standards that apply to those waters. However, in addition to the TAS WQS that the Tribe has submitted to EPA for approval, the Tribe has also adopted tribal water quality standards that apply to the other waters of the Reservation, including where the discharge occurs. These WQS are referred to as "Reservation WQS" in this fact sheet.

In 1993, EPA issued the *Guidance on EPA's NPDES and Sludge Management Permit Procedures on Federal Indian Reservations* (from Cynthia Doughtery to Water Management Division Directors Regions I-X, November 16, 1993) which set forth EPA's position on NPDES permitting on tribal lands. This memo states that EPA Regions should work with the Tribes who have adopted water quality standards not yet approved by EPA to ensure that, to the extent practicable, NPDES permits issued on the Reservation achieve compliance with those water quality standards. In addition, the memo states that "[u]ntil a Tribe is authorized under Section 303 [i.e., has TAS], EPA is the certification authority." 40 CFR 121.21(b) requires that EPA issue 401 certifications where water quality standards have been established but there is no state/agency who has the authority to issue the certification. This regulatory section implements Section 401(d) of the CWA which requires that a certification set forth the effluent limitations and monitoring requirements necessary to assure that the permittee complies with the appropriate sections of the CWA, and with any appropriate requirements of State law.

Given the EPA guidance memo as well as the regulatory/statutory provisions, EPA believes it is appropriate to consider the Coeur d'Alene Tribe's water quality standards in determining the

applicable designated uses and criteria for Plummer Creek as long as the water quality standards are consistent with Section 303 of the CWA, as well as EPA's implementing regulations at 40 CFR 131, and they are protective of downstream waters (*i.e.,* TAS waters of the Coeur d'Alene Tribe).

Moreover, it should be noted that since the Coeur d'Alene Tribe's WQS are generally as stringent as or more stringent than the State of Idaho's WQS, the effluent limits in the permit will also ensure compliance with Idaho's WQS, which apply to the portion of Lake Coeur d'Alene that is not within the Coeur d'Alene Reservation.

In the Coeur d'Alene Tribe's WQS addressing non-TAS waters, Plummer Creek is designated for agricultural water supply, recreational and cultural use, and aquatic life uses including cutthroat trout (see the Reservation WQS at Section 21). In addition, all Reservation TAS waters are designated for the uses of industrial water supply, aesthetics, and wildlife habitat (see the Reservation WQS at Section 20).

In the Coeur d'Alene Tribe's TAS WQS, Lake Coeur d'Alene is designated for domestic water supply, recreational and cultural use, and aquatic life uses including bull trout and cutthroat trout (see the WQS at section 21). Water quality criteria that ensure protection of these uses appear in Sections 7 and 19 of the TAS WQS. In addition, all Reservation TAS waters are designated for the uses of industrial water supply, aesthetics, and wildlife habitat. Water quality criteria for industrial water supply, aesthetics, and wildlife habitat uses will generally be satisfied by implementation of the general conditions in section 3 of the TAS WQS, and the narrative water quality criteria in section 5 of the WQS (see the TAS WQS at section 20).

Antidegradation

Overview

EPA is required by Section 301(b)(1)(C) of the Clean Water Act and implementing regulations (40 CFR 122.4(d) and 122.44(d)) to establish conditions in NPDES permits that ensure compliance with State or Tribal water quality standards, including those of downstream States that are affected by the discharge, and including antidegradation requirements. The fact that the Coeur d'Alene Tribe has not identified methods for implementing its antidegradation policy does not prevent EPA from establishing such conditions.

As explained below, the draft City of Plummer WWTP NPDES permit is as stringent as necessary to ensure compliance with all applicable water quality standards, including the Coeur d'Alene Tribe's antidegradation policy (section 6 of both the Reservation and TAS WQS). The level of antidegradation protection applicable to a waterbody depends upon whether the waterbody is "high quality;" that is to say, whether the quality of the waters exceeds levels necessary to support propagation of fish, shellfish and wildlife and recreation in and on the water (see section 6, paragraph 2 of both the Reservation and TAS WQS). If the waterbody is high quality, then the receiving water receives Tier II antidegradation protection in addition to Tier I protection. All waters receive Tier I protection (see the Reservation and TAS WQS at section 6, paragraph 1). A Tier I analysis involves analyzing whether the permit ensures that "the existing in stream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected" consistent with the requirements of 40 CFR 131.12(a)(1) and section 6, paragraph 1 of the Reservation and TAS WQS (i.e., Tier I analysis). As explained below, Plummer Creek does not warrant Tier II protection; therefore, a Tier II analysis is not required.

The antidegradation policy for outstanding resource waters is inapplicable in this permit because no waters of the Coeur d'Alene Tribe are designated as "outstanding resource waters" (Reservation and TAS WQS Section 6 paragraph 3).

EPA Antidegradation Analysis

Determining the Applicable Level of Protection

Unlike the State of Idaho, the Coeur d'Alene Tribe does not have implementation methods for its antidegradation policy that define how an antidegradation evaluation should be performed. The evaluation of whether a waterbody receives Tier II protection in addition to Tier I protection may be done on a pollutant-by-pollutant or a waterbody-by-waterbody basis (63 FR 36782-36783). Within the State of Idaho, antidegradation analyses for NPDES permits are done on a waterbody-by-waterbody basis, per Idaho Code Section 39-3603(2)(b). To ensure consistency with the State of Idaho, EPA has chosen a waterbody-by-waterbody basis for the antidegradation analysis for the City of Plummer permit.

EPA has reviewed available water quality data for Plummer Creek upstream from the point of discharge to determine whether the receiving waters should receive Tier II protection in addition to Tier I protection. The data are summarized in Table 1, below. As shown in Table 1, water quality for dissolved oxygen (DO) and pH do not consistently meet the Tribe's numeric water quality criteria for these parameters, for aquatic life uses (Reservation WQS section 19, paragraph 4(b)(ii)).

The Coeur d'Alene Tribe does not have numeric water quality criteria for nutrients (i.e. total phosphorus and total nitrogen), however, the Tribe does have a narrative criterion for nutrients, which reads, "nutrients or other substances from anthropogenic causes shall not be present in concentrations which will produce objectionable algal densities or nuisance aquatic vegetation, result in a dominance of nuisance species, or otherwise cause nuisance conditions." For total phosphorus (TP), EPA has interpreted the Tribe's narrative criterion for nutrients using the recommendations in *Quality Criteria for Water 1986*, which states that, "to prevent the development of biological nuisances and to control accelerated or cultural eutrophication, total phosphates as phosphorus (P) should not exceed 50 µg/L in any stream at the point where it enters any lake or reservoir…." Plummer Creek is a tributary to Lake Chatcolet, which is part of Lake Coeur d'Alene, so TP should not exceed 50 µg/L in Plummer Creek. The maximum concentration of TP in Plummer Creek, upstream from the discharge, is 548 µg/L, and the average concentration is 130 µg/L. For total nitrogen (TN), EPA has interpreted the Tribe's narrative water quality criterion for nutrients using *EPA's Ambient Water Quality Criteria Recommendations: Information Supporting the Development of State and Tribal Nutrient Criteria: Rivers and Streams in Nutrient Ecoregion II* (EPA 2000). This document recommends an average TN concentration of 0.12 mg/L. The average total nitrogen concentration in Plummer Creek is 1.41 mg/L, and the median TN concentration is 0.86 mg/L. The concentrations of TP and TN in Plummer Creek are higher than the levels necessary to ensure compliance with the Tribe's narrative water quality criterion for nutrients.

The Tribe's water quality criteria for turbidity, for aquatic life uses, are dependent upon natural background conditions (see the Reservation WQS at section 19, paragraph 4(b)(iv)). The Tribe's WQS define natural background conditions as "surface water quality that would be present without human-caused pollution." The natural background turbidity of Plummer Creek is unknown, so EPA cannot determine whether Plummer Creek meets the Tribe's numeric water

quality criteria for turbidity. The Tribe also has a narrative criterion for turbidity, which states, "turbidity shall not be at a level to impair designated uses or aquatic biota."

Table 1: Ambient Water Quality Data Summary for Plummer Creek Upstream from the WWTP

Parameter:	Dissolved Oxygen (mg/L)	Nitrate as N (mg/L)	Total Nitrogen (mg/L)	E. Coli (#/100 ml)		Total Phosphorus as P (µg/L)
Minimum	1.61	0.010	0.16	10 (one sample)		31
5th Percentile	1.99	0.014	0.31			54
Median	8.04	0.186	0.86			96
Average	7.70	0.809	1.41			130
95th Percentile	12.24	3.83	5.05			273
Maximum	12.65	5.60	7.20			548
Numeric Water Quality Criterion	9.5 mg/L min. 7-day average and 8.0 mg/L min. at all times.	N/A	N/A	126		N/A
Parameter:	Total Suspended Solids (mg/L)	Turbidity (NTU)	pH (s.u.)	Temperature[3] (°C)		Ammonia[2] (mg/L)
				Feb - June	July - Jan	
Minimum	2.00	1.20	6.50	0.52	-0.10	0.020
5th Percentile	2.88	4.78	6.69	0.53	1.01	N/A
Median	11.0	15.9	7.25	6.70	12.4	0.030
Average	30.2	25.9	7.21	8.00	10.1	0.043
95th Percentile	138	85.6	7.82	14.7	16.3	N/A
Maximum	202	130	9.25	16.6	16.6	0.120
Numeric Water Quality Criterion	N/A	Varies based on natural background conditions	6.5 – 8.5	18	21	2.77

Notes:
1. Only a minimum and a maximum value are reported for nitrite because most values were reported as "less than" some value (left-censored) or non-detect.
2. 5th percentile and 95th percentile values are not reported for ammonia because there too few data points to calculate these statistics.
3. There are additional criteria for temperature that are expressed as 7-day average of the daily maximum (7DADM) temperatures but there are not enough data to evaluate compliance with these criteria.

The Tribe's Reservation WQS do not contain numeric water quality criteria for total suspended solids (TSS) for aquatic life or recreation uses, however, the Tribe's narrative criteria state that Reservation waters "shall be free from …suspended substances of a persistent nature resulting from anthropogenic causes." Suggested limits for suspended sediment have been developed by the European Inland Fisheries Advisory Commission and the National Academy of Sciences. A limit of 25 mg/L of suspended sediment provides a high level of protection of aquatic organisms; 80 mg/L moderate protection; 400 mg/L low protection; and over 400 mg/L very low protection (Thurston et al. 1979). The maximum concentration of TSS in Plummer Creek upstream from the point of discharge is 202 mg/L. Thus, TSS concentrations in Plummer Creek do not consistently provide even a moderate level of protection for aquatic communities.

Because water quality data for DO, pH, TSS, TN, and TP indicate that Plummer Creek does not consistently meet the Tribe's numeric and narrative water quality criteria for these parameters,

EPA believes that the water quality of Plummer Creek does not exceed levels necessary to support propagation of fish and wildlife. Therefore, Plummer Creek receives only Tier I protection for aquatic life uses.

The only water quality parameter for which criteria have been established specifically for recreation uses is E. coli. Only one data point is available for this parameter, thus, it is unclear whether the Tribe's numeric water quality criteria for E. coli are attained in Plummer Creek. Recreation uses would not be affected by the DO and pH exceedances discussed above. However, the elevated nutrient and sediment concentrations could impair recreation uses in Plummer Creek. High turbidity can also interfere with recreational uses (EPA 1976). Therefore, EPA believes that the water quality of Plummer Creek does not exceed levels necessary to support recreation in and on the water. Therefore Plummer Creek receives only Tier I protection for recreation uses.

Protection of Existing Uses or Tier I Protection (WQS Section 6 Paragraph 1 and 40 CFR 131.12(a)(1))

In the Reservation WQS, Plummer Creek is designated for agricultural water supply, recreational and cultural use, and aquatic life uses including cutthroat trout (see the Reservation WQS at Section 21). In addition, all Reservation TAS waters are designated for the uses of industrial water supply, aesthetics, and wildlife habitat (see the Reservation WQS at Section 20).

Lake Coeur d'Alene, downstream from the point of discharge, has these same designated beneficial uses, except that Lake Coeur d'Alene is designated for both bull trout and cutthroat trout (see TAS WQS at sections 20 and 21). The numeric and narrative water quality criteria are set at levels that ensure protection of the designated uses. As there is no information indicating the presence of existing beneficial uses in Plummer Creek or Lake Coeur d'Alene other than those that are designated, the draft permit ensures a level of water quality necessary to protect the designated uses and, in compliance with section 6, paragraph 1 of the Reservation and TAS WQS and 40 CFR 131.12(a)(1), also ensures that the level of water quality necessary to protect existing uses is maintained and protected.

If EPA receives information during the public comment period demonstrating that there are existing uses in Plummer Creek or Lake Coeur d'Alene for which these waters are not designated, EPA will consider this information before issuing a final permit and will establish additional or more stringent permit conditions if necessary to ensure protection of existing uses.

Summary

Effluent limits for all parameters are set at a level that will protect and maintain designated and existing uses. Therefore the draft permit complies with Section 6, paragraph 1 of the Tribe's WQS, or Tier I antidegradation protection. As explained above, the quality of the receiving water does not exceed the levels necessary to support propagation of fish and wildlife and recreation in and on the water, thus the receiving water does not receive Tier II antidegradation protection under Section 6, paragraph 2 of the Tribe's Reservation and TAS WQS.

C. Restrictions on Permitting New Dischargers

Although the City previously owned and operated a POTW treatment plant, and held an NPDES permit authorizing the discharge of pollutants from that treatment plant, the draft NPDES permit authorizes a discharge from a new treatment plant. The new treatment plant is located at a

different site from the old treatment plant, and it discharges pollutants from a new outfall which is located about 4,000 feet from the old treatment plant's outfall.

40 CFR 122.2 defines a "new discharger" as "any building, structure, facility or installation (a) from which there is or may be a 'discharge of pollutants;' (b) that did not commence the 'discharge of pollutants' at a particular 'site' prior to August 13, 1979; (c) which is not a 'new source;' and (d) which has never received a finally effective NPDES permit for discharges at that 'site." The subject facility will be discharging pollutants to waters of the U.S.; it did not commence the discharge at this particular site prior to August 13, 1979; it is not a new source; and, it has never received a finally effective NPDES permit for discharges at this particular site. Therefore, the City of Plummer WWTP is a new discharger as that term is defined in 40 CFR 122.2.

40 CFR 122.4(i) places restrictions on the issuance of NPDES permits to new sources or new dischargers. Specifically, it states that:

> No permit may be issued … to a new source or a new discharger if the discharge from its … operation will cause or contribute to the violation of water quality standards. The owner or operator of a new source or new discharger proposing to discharge into a water segment which does not meet applicable water quality standards or is not expected to meet those standards … and for which the State … has performed a pollutants load allocation for the pollutant to be discharged, must demonstrate … that (1) There are sufficient remaining pollutant load allocations to allow for the discharge; and (2) The existing dischargers into the segment are subject to compliance schedules designed to bring the segment into compliance with applicable water quality standards (40 CFR 122.4(i)).

The City of Plummer WWTP discharge will not cause or contribute to the violation of water quality standards. While EPA determined that the proposed discharge has the reasonable *potential* to cause or contribute to violations of water quality standards for sediment, dissolved oxygen, bacteria, ammonia, phosphorus and pH (see Appendices C and D), the draft permit contains water quality-based effluent limits which will ensure that the level of water quality for these parameters to be achieved by these effluent limits is derived from and complies with applicable water quality standards (40 CFR 122.44(d)(1)). When calculating effluent limits, water quality criteria for sediment, bacteria, ammonia, phosphorus and pH have been applied at the end of pipe; dilution was not considered in the calculation of effluent limits for these pollutants. A DO sag analysis for the discharge found that, with an effluent BOD concentration of 15 mg/L, there is no DO sag but rather immediate reaeration of Plummer Creek (Bartelsen 2006). Therefore, EPA has established water quality-based effluent limits for BOD_5 of 10 mg/L as an average monthly limit and 15 mg/L as an average weekly limit. Therefore, the discharge of these pollutants, as authorized by the permit, will not cause or contribute to violations of water standards. Furthermore, as explained above, the conditions in the permit will ensure compliance with the Coeur d'Alene Tribe's antidegradation policy.

The receiving water is not listed under Section 303(d) of the Clean Water Act as not attaining or not being expected to attain water quality standards. The Coeur d'Alene Tribe has not performed

a pollutants load allocation or total maximum daily load (TMDL) for the receiving water for any pollutant. Thus, there is no need to demonstrate that there are sufficient remaining load allocations to allow for the discharge or that the existing dischargers into the segment are subject to compliance schedules before issuing this permit.

IV. Effluent Limitations

A. Basis for Effluent Limitations

In general, the CWA requires that the effluent limits for a particular pollutant be the more stringent of either technology-based limits or water quality-based limits. Technology-based limits are set according to the level of treatment that is achievable using available technology. A water quality-based effluent limit is designed to ensure that the water quality standards applicable to a waterbody are being met and may be more stringent than technology-based effluent limits. The basis for the effluent limits proposed in the draft permit is provided in Appendices C, D, and E.

B. Proposed Effluent Limitations

Below are the proposed effluent limits that are in the draft permit.

1. Except as specifically authorized in Table 1, the permittee must not discharge visible oils, scum, foam, grease, or other floating materials and suspended substances.
2. Removal Requirements for BOD_5 and TSS: The monthly average effluent concentration must not exceed 15 percent of the monthly average influent concentration. Percent removal of BOD_5 and TSS must be reported on the Discharge Monitoring Reports (DMRs). For each parameter, the monthly average percent removal must be calculated from the arithmetic mean of the influent values and the arithmetic mean of the effluent values for that month. Influent and effluent samples must be taken over approximately the same time period.
3. The permittee must not use chlorine for disinfection or elsewhere in the treatment process.

Table 2 (below) presents the proposed numeric effluent limits.

Table 2: Proposed Effluent Limits				
Parameter	**Units**	**Effluent Limits**		
		Average Monthly Limit	**Average Weekly Limit**	**Maximum Daily Limit**
Five-Day Biochemical Oxygen Demand (BOD_5)	mg/L	10	15	—
	lb/day	27	40	—
	% removal	85% (min.)	—	—
Total Suspended Solids (TSS)	mg/L	17	25	—
	lb/day	45	67	—
	% removal	85% (min.)	—	—
E. Coli	#/100 ml	126[1]	—	235[2]
pH	s.u.	6.5 – 8.5 at all times		
Total Ammonia as N	mg/L	2.50	—	7.80
	lb/day	6.67	—	20.8
Total Phosphorus as P	µg/L	50	131	—
	lb/day	0.133	0.350	—

Notes:
1. Geometric mean.
2. Instantaneous/single sample maximum.

V. Monitoring Requirements

A. Basis for Effluent and Surface Water Monitoring

Section 308 of the CWA and federal regulation 40 CFR 122.44(i) require monitoring in permits to determine compliance with effluent limitations. Monitoring may also be required to gather effluent and surface water data to determine if additional effluent limitations are required and/or to monitor effluent impacts on receiving water quality.

The permittee is responsible for conducting the monitoring and for reporting results on Discharge Monitoring Reports (DMRs) and on the application for renewal, as appropriate, to the U.S. Environmental Protection Agency (EPA).

B. Effluent Monitoring

Monitoring frequencies are based on the nature and effect of the pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance. Permittees have the option of taking more frequent samples than are required under the permit. These samples can be used for averaging if they are conducted using EPA-approved test methods (generally found in 40 CFR 136) and if the method detection limits are less than the effluent limits.

Table 3, below, presents the proposed effluent monitoring requirements for the City of Plummer WWTP. The sampling location must be after the last treatment unit and prior to discharge to the receiving water. If no discharge occurs during the reporting period, "no discharge" shall be reported on the DMR.

The monitoring frequencies are generally consistent with monitoring frequencies required of other POTWs in Idaho with similar design flows. Once per week monitoring is proposed for ammonia and TP, in order to determine compliance with water quality-based effluent limits for those parameters. The five sample per month monitoring frequency for E. coli is based on the Tribe's water quality criterion for E. coli (Reservation WQS Section 19 paragraph 3). Twice per month monitoring is proposed for BOD_5 and TSS in order to determine compliance with water quality-based effluent limits for those parameters.

The draft permit proposes to require quarterly monitoring for all parameters listed in Part B.6 of the application form for POTWs (EPA Form 3510-2A, revised 1-99, see also Appendix J to 40 CFR Part 122) that are not subject to effluent limitations, except for total residual chlorine, which may be deleted because the facility does not use chlorine for disinfection.[1] Effluent dissolved oxygen is to be sampled once per month.

Table 3: Effluent Monitoring Requirements

Parameter	Units	Sample Location	Sample Frequency	Sample Type
Flow	mgd	Influent & Effluent	Continuous	recording
Temperature	°C	Effluent	Continuous	recording
BOD_5	mg/L	Influent & Effluent	2/month	24-hour composite
	lb/day	Influent & Effluent		calculation[1]
	% Removal	% Removal	1/month	calculation[2]
TSS	mg/L	Influent & Effluent	2/month	24-hour composite
	lb/day	Influent & Effluent		calculation[1]
	% Removal	% Removal	1/month	calculation[2]
E. Coli	#/100 ml	Effluent	5/month	grab
pH	standard units	Effluent	1/week	grab
Total Ammonia as N	mg/L	Effluent	1/week	24-hour composite
	lb/day			calculation[1]
Total Phosphorus as P	mg/L	Effluent	1/week	24-hour composite
	lb/day			calculation[1]
Alkalinity	mg/L as $CaCO_3$	Effluent	1/quarter	24-hour composite
Dissolved Oxygen	mg/L	Effluent	1/month	grab
Oil and Grease	mg/L	Effluent	1/quarter	grab
Nitrate + Nitrite as N	mg/L	Effluent	1/quarter	24-hour composite
Total Dissolved Solids	mg/L	Effluent	1/quarter	24-hour composite
Total Kjeldahl Nitrogen	mg/L	Effluent	1/quarter	24-hour composite

Notes:
1. Loading is calculated by multiplying the concentration in mg/L by the flow in mgd and a conversion factor of 8.34. If the concentration is measured in µg/L, the conversion factor is 0.00834.
2. Percent removal is calculated using the following equation:
(average monthly influent concentration – average monthly effluent concentration) ÷ average monthly influent concentration.

C. Surface Water Monitoring

Table 4 presents the proposed surface water monitoring requirements for the draft permit. Surface water monitoring results must be submitted annually by January 10th. EPA proposes to discontinue the surface water monitoring for that had been required in the City's prior NPDES permit for pH, ammonia, TP and flow. The pH and ammonia surface water monitoring was

[1] See 40 CFR 122.21(j)(4)(iii)

included in the prior permit in order to determine if the discharge had the reasonable potential to cause or contribute to excursions above water quality standards for ammonia, and, similarly, the surface water monitoring requirement for TP was included in the prior permit in order to determine if the TP in the discharge had the reasonable potential to cause or contribute to excursions above the Tribe's water quality standards for nutrients. EPA has determined that the discharge has the reasonable potential to cause or contribute to excursions above water quality standards for ammonia and TP, and has established water quality-based effluent limits for ammonia and TP, as required by federal regulations (40 CFR 122.44(d)(1)). Because the critical low flow of the receiving water is too low to consistently provide significant dilution of the effluent, the ammonia effluent limits require compliance with water quality criteria for ammonia and TP at the end of pipe. Furthermore, the permit contains water quality-based effluent limits for pH, which apply water quality criteria at the end-of-pipe. It is therefore no longer necessary to monitor the receiving water concentration of pH, ammonia or phosphorus.

Table 4: Receiving Water Monitoring Requirements

Parameter (units)	Sample Locations	Sample Frequency
Dissolved oxygen (mg/L)	Upstream and downstream	1/month[1]
Five-day biochemical oxygen demand (mg/L)	Upstream and downstream	1/month[1]
Temperature (°C)	Upstream and downstream	1/month[1]

Notes:
1. Monitoring must take place once during each of the following months: June, July, August, and September.

VI. Sludge (Biosolids) Requirements

EPA Region 10 separates wastewater and sludge permitting. EPA has authority under the CWA to issue separate sludge-only permits for the purposes of regulating biosolids. EPA may issue a sludge-only permit to each facility at a later date, as appropriate.

Until future issuance of a sludge-only permit, sludge management and disposal activities at each facility continue to be subject to the national sewage sludge standards at 40 CFR Part 503 and any requirements of the State's biosolids program. The Part 503 regulations are self-implementing, which means that facilities must comply with them whether or not a permit has been issued.

VII. Other Permit Conditions

A. Quality Assurance Plan

The federal regulation at 40 CFR 122.41(e) requires the permittee to develop procedures to ensure that the monitoring data submitted is accurate and to explain data anomalies if they occur. The City is required to update the Quality Assurance Plan for the wastewater treatment plant within 180 days of the effective date of the final permit. The Quality Assurance Plan shall consist of standard operating procedures the permittee must follow for collecting, handling, storing and shipping samples, laboratory analysis, and data reporting.

B. Operation and Maintenance Plan

The permit requires the City to properly operate and maintain all facilities and systems of treatment and control. Proper operation and maintenance is essential to meeting discharge limits, monitoring requirements, and all other permit requirements at all times. The permittee is required to develop and implement an operation and maintenance plan for their facility within 180 days of the effective date of the final permit. The plan shall be retained on site and made available to EPA and IDEQ upon request.

C. Sanitary Sewer Overflows and Proper Operation and Maintenance of the Collection System

Untreated or partially treated discharges from separate sanitary sewer systems are referred to as sanitary sewer overflows (SSOs). SSOs may present serious risks of human exposure when released to certain areas, such as streets, private property, basements, and receiving waters used for drinking water, fishing and shellfishing, or contact recreation. Untreated sewage contains pathogens and other pollutants, which are toxic. SSOs are not authorized under this permit. Pursuant to the NPDES regulations, discharges from separate sanitary sewer systems authorized by NPDES permits must meet effluent limitations that are based upon secondary treatment. Further, discharges must meet any more stringent effluent limitations that are established to meet State or Tribal water quality standards.

The permit contains language to address SSO reporting and public notice and operation and maintenance of the collection system. The permit requires that the permittee identify SSO occurrences and their causes. In addition, the permit establishes reporting, record keeping and third party notification of SSOs. Finally, the permit requires proper operation and maintenance of the collection system. The following specific permit conditions apply:

Immediate Reporting – The permittee is required to notify the EPA of an SSO within 24 hours of the time the permittee becomes aware of the overflow. (See 40 CFR 122.41(l)(6)).

Written Reports – The permittee is required to provide the EPA a written report within five days of the time it became aware of any overflow that is subject to the immediate reporting provision. (See 40 CFR 122.41(l)(6)(i)).

Third Party Notice – The permit requires that the permittee establish a process to notify specified third parties of SSOs that may endanger health due to a likelihood of human exposure; or unanticipated bypass and upset that exceeds any effluent limitation in the permit or that may endanger health due to a likelihood of human exposure. The permittee is required to develop, in consultation with appropriate authorities at the local, county, tribal and/or state level, a plan that describes how, under various overflow (and unanticipated bypass and upset) scenarios, the public, as well as other entities, would be notified of overflows that may endanger health. The plan should identify all overflows that would be reported and to whom, and the specific information that would be reported. The plan should include a description of lines of communication and the identities of responsible officials. (See 40 CFR 122.41(l)(6)).

Record Keeping – The permittee is required to keep records of SSOs. The permittee must retain the reports submitted to the EPA and other appropriate reports that could include work orders associated with investigation of system problems related to a SSO, that describes the steps taken or planned to reduce, eliminate, and prevent reoccurrence of the SSO. (See 40 CFR 122.41(j)).

Proper Operation and Maintenance – The permit requires proper operation and maintenance of the collection system. (See 40 CFR 122.41(d) and (e)). SSOs may be indicative of improper operation and maintenance of the collection system. The permittee may consider the development and implementation of a capacity, management, operation and maintenance (CMOM) program.

The permittee may refer to the Guide for Evaluating Capacity, Management, Operation, and Maintenance (CMOM) Programs at Sanitary Sewer Collection Systems (EPA 305-B-05-002). This guide identifies some of the criteria used by EPA inspectors to evaluate a collection system's management, operation and maintenance program activities. Owners/operators can review their own systems against the checklist (Chapter 3) to reduce the occurrence of sewer overflows and improve or maintain compliance.

D. Standard Permit Provisions

Sections III, IV, and V of the draft permit contain standard regulatory language that must be included in all NPDES permits. Because these requirements are based directly on NPDES regulations, they cannot be challenged in the context of an NPDES permit action. The standard regulatory language covers requirements such as monitoring, recording, and reporting requirements, compliance responsibilities, and other general requirements.

VIII. Other Legal Requirements

A. Endangered Species Act

The Endangered Species Act requires federal agencies to consult with National Oceanic and Atmospheric Administration Fisheries (NOAA Fisheries) and the U.S. Fish and Wildlife Service (USFWS) if their actions could beneficially or adversely affect any threatened or endangered species. EPA has determined that the issuance of this NPDES permit will have no effect on threatened or endangered species. Therefore, consultation is not required for this action. However, EPA will notify USFWS and NOAA Fisheries of the issuance of this draft permit and will consider any comments made by the Services prior to issuance of a final permit. See Appendix F of this fact sheet for more information.

B. Essential Fish Habitat

Essential fish habitat (EFH) is the waters and substrate (sediments, etc.) necessary for fish to spawn, breed, feed, or grow to maturity. The Magnuson-Stevens Fishery Conservation and Management Act (January 21, 1999) requires EPA to consult with NOAA Fisheries when a proposed discharge has the potential to adversely affect (reduce quality and/or quantity of) EFH. EPA has determined that the discharge from the City of Plummer WWTP will not affect any EFH species in the vicinity of the discharge, therefore consultation is not required for this action. See Appendix F of this fact sheet for more information.

C. Permit Expiration

The permit will expire five years from the effective date.

IX. References

Bertelsen, K. 2006. Memorandum to Alan Gay, P.E. Subject: 689500 – DO sag curves. USKH. August 15, 2006.

EPA. 1976. *Quality Criteria for Water*. EPA-440-9-76-023. July 1976.

EPA. 1986. *Quality Criteria for Water 1986*. Environmental Protection Agency. Office of Water. Regulations and Standards. Washington, DC. May 1, 1986. EPA-440-5-86-001.

EPA. 1991. *Technical Support Document for Water Quality-based Toxics Control.* US Environmental Protection Agency, Office of Water, EPA/505/2-90-001. March 1991.

EPA. 2000. *Ambient Water Quality Criteria Recommendations: Information Supporting the Development of State and Tribal Nutrient Criteria: Lakes and Reservoirs in Nutrient Ecoregion II*. Office of Water. EPA 822-B-00-007. December 2000.

EPA. 2005. *Guide for Evaluating Capacity, Management, Operation, and Maintenance (CMOM) Programs at Sanitary Sewer Collection Systems*. US Environmental Protection Agency, Office of Enforcement and Compliance Assurance, EPA 305-B-05-002.

Thurston R.V., R.C. Russo, C.M. Fetterolf, T.A. Edsall, Y.M. Barber Jr., editors. 1979. *Review of the EPA Red Book: Quality Criteria for Water.* Bethesda, MD. Water Quality Section, American Fisheries.

Appendix A: Facility Information

General Information

NPDES ID Number:	ID0022781
Physical Location:	Totely Road SE ¼ SE ¼ Section 7, Range 4 west, township 46 north Plummer, Idaho
Mailing Address:	P.O. Box B Plummer, ID 83851
Facility Background:	The permitted facility is new. The City of Plummer's prior NPDES permit authorized discharges from a lagoon wastewater treatment plant that has been decommissioned.

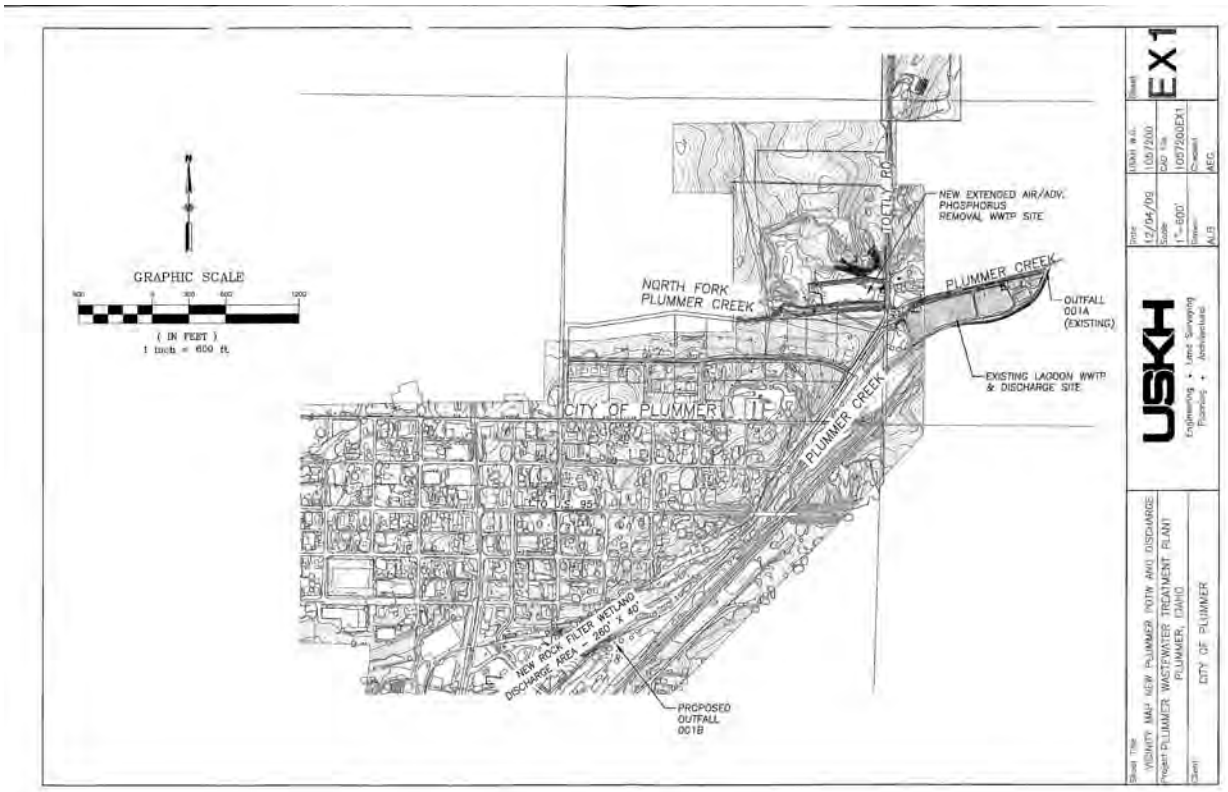
Facility Information

Type of Facility:	Publicly Owned Treatment Works (POTW)
Treatment Train:	The facility consists of an extended aeration activated sludge process with an anaerobic tank and fermenter for biological phosphorus removal. After the wastewater undergoes biological treatment, additional phosphorus removal is provided by ferric sulfate addition and filtration. The facility uses ultraviolet disinfection. Waste sludge is dewatered using belt filter presses.
Flow:	Design flow is 0.32 mgd.
Outfall Location:	47° 19' 55" N, 116° 53' 07" W

Receiving Water Information

Receiving Water:	Plummer Creek
Watershed:	St. Joe (HUC 17010304)
Beneficial Uses:	For Plummer Creek: agricultural water supply, recreational and cultural use, aquatic life uses including cutthroat trout, industrial water supply, aesthetics, and wildlife habitat For Lake Coeur d'Alene: Domestic water supply, industrial water supply, recreational and cultural use, aquatic life uses including bull trout and cutthroat trout, aesthetics, and wildlife habitat.

Appendix B: Facility Map



Appendix C: Basis for Effluent Limits

The following discussion explains in more detail the statutory and regulatory basis for the technology and water quality-based effluent limits in the draft permit. Part A discusses technology-based effluent limits, Part B discusses water quality-based effluent limits in general, and Part C discusses facility specific water quality-based effluent limits.

A. Technology-Based Effluent Limits

Federal Secondary Treatment Effluent Limits

The CWA requires POTWs to meet requirements based on available wastewater treatment technology. Section 301 of the CWA established a required performance level, referred to as "secondary treatment," which all POTWs were required to meet by July 1, 1977. EPA has developed and promulgated "secondary treatment" effluent limitations, which are found in 40 CFR 133.102. These technology-based effluent limits apply to all municipal wastewater treatment plants and identify the minimum level of effluent quality attainable by application of secondary treatment in terms of BOD_5, TSS, and pH. The federally promulgated secondary treatment effluent limits are listed in Table C-1.

Table C-1: Secondary Treatment Effluent Limits
(40 CFR 133.102)

Parameter	Average Monthly Limit	Average Weekly Limit	Range
BOD_5	30 mg/L	45 mg/L	---
TSS	30 mg/L	45 mg/L	---
Removal Rates for BOD_5 and TSS	85% (minimum)	---	---
pH	---	---	6.0 - 9.0 s.u.

Chlorine

The City of Plummer WWTP uses ultraviolet disinfection and does not have the ability to use chlorine for disinfection. Therefore, no technology-based effluent limits for chlorine are applicable to this facility.

Use of Technology-based Effluent Limits in the Draft Permit

As explained below, EPA has determined that more-stringent water quality-based effluent limits are necessary for BOD and TSS concentration and pH, as well as E. coli, ammonia, and total phosphorus (TP), in order to ensure compliance with water quality standards. The draft permit proposes the technology-based 85% removal rate effluent limits from the secondary treatment rule, for BOD_5 and TSS.

B. Water Quality-based Effluent Limits

Statutory and Regulatory Basis

Section 301(b)(1)(C) of the CWA requires the development of limitations in permits necessary to meet water quality standards by July 1, 1977. Discharges to State or Tribal waters must also

comply with limitations imposed by the State or Tribe as part of its certification of NPDES permits under section 401 of the CWA. Federal regulations at 40 CFR 122.4(d) prohibit the issuance of an NPDES permit that does not ensure compliance with the water quality requirements of all affected States. The NPDES regulation 40 CFR 122.44(d)(1) implementing Section 301(b)(1)(C) of the CWA 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 State or Tribal water quality standard, including narrative criteria for water quality, and that the level of water quality to be achieved by limits on point sources is derived from and complies with all applicable water quality standards.

The regulations require the permitting authority to make this evaluation using procedures which account for existing controls on point and nonpoint sources of pollution, the variability of the pollutant in the effluent, species sensitivity (for toxicity), and where appropriate, dilution in the receiving water. The limits must be stringent enough to ensure that water quality standards are met, and must be consistent with any available wasteload allocation.

Reasonable Potential Analysis

When evaluating the effluent to determine if water quality-based effluent limits are needed, based on numeric criteria, EPA projects the receiving water concentration (downstream of where the effluent enters the receiving water) for each pollutant of concern. EPA uses the concentration of the pollutant in the effluent and receiving water and, if appropriate, the dilution available from the receiving water, to project the receiving water concentration. If the projected concentration of the pollutant in the receiving water exceeds the numeric criterion for that specific chemical, then the discharge has the reasonable potential to cause or contribute to an exceedance of the applicable water quality standard, and a water quality-based effluent limit is required.

Mixing Zones

Sometimes it is appropriate to allow a small area of the receiving water to provide dilution of the effluent. These areas are called mixing zones. Mixing zone allowances will increase the mass loadings of the pollutant to the water body and will decrease treatment requirements. Mixing zones can be used only when there is adequate receiving water flow volume and when the receiving water meets the criteria necessary to protect the designated uses of the water body.

It is not appropriate for EPA to use mixing zones or to consider dilution when determining reasonable potential and calculating effluent limits for the City of Plummer NPDES permit. According to the permit application and to measurements performed by the Coeur d'Alene Tribe, the minimum flow rate of the receiving water is zero at the point of discharge. Even near the mouth of Plummer Creek, several miles downstream from the point of discharge, the critical low flow rates (e.g. 1Q10, 7Q10) are less than the design flow of the POTW. Thus, the receiving water cannot consistently provide significant dilution of the effluent.

Procedure for Deriving Water Quality-based Effluent Limits

The first step in developing a water quality-based effluent limit is to develop a wasteload allocation (WLA) for the pollutant. A wasteload allocation is the concentration or loading of a pollutant that the permittee may discharge without causing or contributing to an exceedance of

water quality standards in the receiving water. In cases where a mixing zone is not authorized, the criterion becomes the WLA. Establishing the criterion as the wasteload allocation ensures that the permittee will not cause or contribute to an exceedance of the criterion.

Once a WLA is developed, EPA calculates effluent limits which are protective of the WLA using statistical procedures described in Appendix E. The following discussion details the specific water quality-based effluent limits in the draft permit.

C. Facility-Specific Water Quality-based Limits

Ammonia

The Coeur d'Alene Tribe's water quality standards contain criteria for the protection of aquatic life from the toxic effects of ammonia (see the TAS WQS at sections 7 and 12 and the Reservation WQS at section 7). The Tribe's TAS WQS only contain chronic aquatic life criteria for ammonia that apply where early life stages of fish are absent. The Reservation WQS for ammonia use EPA's Clean Water Act Section 304(a) recommended criteria from 1984 (EPA 440/5-85-001) which have been superseded by more recent recommendations (EPA 1999a).

EPA believes early life stages of fish may be present in Plummer Creek and other tributaries to Lake Coeur d'Alene, and that EPA's current 304(a) recommended criteria should be used in favor of the 1984 criteria. Coeur d'Alene Tribal staff have also indicated that the current 304(a) criteria should be used (personal communication with Scott Fields, Coeur d'Alene Tribe, August 1st, 2011). Therefore, EPA has applied the Clean Water Act Section 304(a) chronic water quality criterion for ammonia, for instances where early life stages of fish are present (EPA 1999a). The criteria are dependent on pH and temperature, because the fraction of ammonia present as the toxic, un-ionized form increases with increasing pH and temperature. Therefore, the criteria become more stringent as pH and temperature increase. The following table details the equations used to determine water quality criteria for ammonia, and the values of these equations at the 95th percentile pH, which is 7.82 standard units, and the 95th percentile temperature observed in Plummer Creek upstream from the discharge, which is 16.3 ºC.

Table C-4: Water Quality Criteria for Ammonia

	Acute Criterion	Chronic Criterion
Equations:	$\frac{0.275}{1+10^{7.204-pH}}+\frac{39}{1+10^{pH-7.204}}$	$\left(\frac{0.0577}{1+10^{7.688-pH}}+\frac{2.487}{1+10^{pH-7.688}}\right)\times MIN\left(2.85,1.45\times10^{0.028\times(25-T)}\right)$
Results	7.80	2.77

As shown in Appendix D, EPA has determined that this discharge has the reasonable potential to cause or contribute to excursions above Idaho's water quality criteria for ammonia. Therefore, EPA has established water quality-based effluent limits for ammonia. The effluent limits for ammonia ensure compliance with water quality criteria at the end-of-pipe; dilution was not considered in the calculation of effluent limits for ammonia.

E. Coli

The Coeur d'Alene Tribe's Reservation WQS state that "waters designated for recreational and cultural use shall not contain concentrations of E. coli bacteria exceeding a 30-day geometric mean of 126 per 100 ml, based on a minimum of 5 samples." The Reservation WQS do not

specify a single sample maximum E coli concentration. The TAS WQS specify a single sample maximum of 235 colonies/100ml. The geometric mean effluent limit is identical to the water quality standard. Consistent with the water quality standard, the permit requires a sampling frequency of five samples per month.

To ensure protection of downstream waters, the permit also includes a single sample maximum effluent limit for E. coli of 235 colonies/100 ml, which is identical to the single sample maximum water quality criterion for TAS waters.

pH

The Tribe's water quality criterion for pH, for aquatic life uses, is a range of 6.5 – 8.5 standard units (Reservation WQS Section 19 paragraph 4(a)). As explained above, no mixing zone was used in determining effluent limits for pH. Thus, the draft permit proposes a pH limit of 6.5 – 8.5 standard units.

Total Suspended Solids

The Coeur d'Alene Tribe has a narrative water quality criterion in both the Reservation and TAS WQS which states that waters of the Reservation shall be free from suspended substances of a persistent nature resulting from anthropogenic causes. Where a State or Tribe has not established a water quality criterion for a specific chemical pollutant that is present in an effluent at a concentration that causes, has the reasonable potential to cause, or contributes to an excursion above a narrative criterion within an applicable State or Tribal water quality standard, the permitting authority must establish effluent limits using one or more of the options provided in 40 CFR 122.44(d)(1)(vi).

EPA is establishing water quality-based effluent limits for total suspended solids based on 40 CFR 122.44(d)(1)(vi)(A), which allows the permitting authority to establish effluent limits using a calculated numeric water quality criterion for the pollutant which the permitting authority demonstrates will attain and maintain applicable narrative water quality criteria and will fully protect the designated use. Suggested limits for suspended sediment have been developed by the European Inland Fisheries Advisory Commission and the National Academy of Sciences. A limit of 25 mg/L of suspended sediment provides a high level of protection of aquatic organisms; 80 mg/L moderate protection; 400 mg/L low protection; and over 400 mg/L very low protection (Thurston et al. 1979). Since Plummer Creek and Lake Coeur d'Alene are designated for sensitive aquatic life uses including bull trout (for Lake Coeur d'Alene only) and cutthroat trout, EPA has interpreted the Tribe's narrative water quality criterion for sediment as requiring a limit of 25 mg/L of suspended sediment, in order to provide a high level of protection for the sensitive aquatic life uses for which the receiving water is designated.

No mixing zone is proposed for TSS, because the receiving water flow rate is too low to provide significant dilution of the effluent, and the 95^{th} percentile concentration of TSS in the receiving water, upstream from the point of discharge (138 mg/L), is higher than the interpreted narrative criterion (25 mg/L). Therefore, the receiving water cannot provide dilution of the TSS in the effluent. NPDES regulations require that effluent limitations for POTWs that discharge continuously be expressed as average monthly and average weekly discharge limitations, unless impracticable (40 CFR 122.45(d)(2)). Therefore, the interpreted narrative criterion (25 mg/L) will be applied at the end-of-pipe, as the average weekly limit. Consistent with the technology-

based effluent limits for TSS, the average monthly limit is equal to two thirds of the average monthly limit, or 17 mg/L. This accounts for effluent variability within a calendar month.

Total Phosphorus as P

As explained below, EPA has determined that the TP in the discharge has the reasonable potential to cause or contribute to excursions above the Coeur d'Alene Tribe's narrative water quality criterion for nutrients.

The Coeur d'Alene Tribe has a narrative water quality criterion in both its Reservation and TAS WQS which reads, "nutrients or other substances from anthropogenic causes shall not be present in concentrations which will produce objectionable algal densities or nuisance aquatic vegetation, result in a dominance of nuisance species, or otherwise cause nuisance conditions." Where a State or Tribe has not established a water quality criterion for a specific chemical pollutant that is present in an effluent at a concentration that causes, has the reasonable potential to cause, or contributes to an excursion above a narrative criterion within an applicable State or Tribal water quality standard, the permitting authority must establish effluent limits using one or more of the options provided in 40 CFR 122.44(d)(1)(vi).

EPA is establishing water quality-based effluent limits for TP based on 40 CFR 122.44(d)(1)(vi)(B), which allows the permitting authority to establish effluent limits using EPA's water quality criteria, published under Section 304(a) of the CWA. EPA has interpreted the Tribe's narrative criterion for nutrients using the recommendations in *Quality Criteria for Water 1986*, which states that, "to prevent the development of biological nuisances and to control accelerated or cultural eutrophication, total phosphates as phosphorus (P) should not exceed 50 µg/L in any stream at the point where it enters any lake or reservoir…." Plummer Creek is a tributary to Lake Chatcolet, which is part of Lake Coeur d'Alene, so TP should not exceed 50 µg/L in Plummer Creek.

The 95th percentile concentration of TP in Plummer Creek, upstream from the discharge, is 273 µg/L, and the average concentration is 130 µg/L. Because the critical low flow rate of the receiving water flow rate is less than the design flow of the POTW and because the concentration of TP in the receiving water upstream from the point of discharge is consistently higher than the interpreted narrative criterion (50 µg/L), the receiving water cannot dilute TP that is present in the effluent, and no mixing zone may be authorized for TP.

EPA has obtained effluent data for TP, for the City's new wastewater treatment plant. The average effluent concentration of TP is 625 µg/L, and the maximum concentration is 2,440 µg/L[2]. Because the effluent concentration of TP is greater than the interpreted narrative criterion (50 µg/L), and because no mixing zone may be authorized for TP, the discharge has the reasonable potential to cause or contribute to excursions above water quality standards for TP, and the permit must contain effluent limits for TP (40 CFR 122.44(d)(1)(i)).

NPDES regulations at 40 CFR 122.45(d)(2) require that effluent limitations for continuous discharges from POTWs be expressed as average monthly and average weekly limits unless impracticable. EPA has set the average monthly limit equal to the 50 µg/L TP wasteload allocation and interpreted narrative criterion. This means the effluent concentration of TP could

[2] One result of 7,380 µg/L, measured early in the plant's operation, was determined to be a statistical outlier and was excluded from consideration.

be greater than 50 µg/L for short periods of time within a calendar month, but such excursions will be of such a short duration and small magnitude that they will be negligible in terms of their effect on phosphorus concentrations in Plummer Creek, Lake Chatcolet and Lake Coeur d'Alene.

Consistent with 40 CFR 122.45(d)(2), EPA has established an average weekly discharge limitation for TP, in addition to the average monthly discharge limitation. To calculate the average weekly limit, EPA used Table 5-3 of the *Technical Support Document for Water Quality-based Toxics Control*. This table provides ratios between the average monthly and the maximum daily limit, however, when the required sampling frequency is once per week or less frequent, there is no practical difference between an average weekly limit and a maximum daily limit. The draft permit proposes a sampling frequency of once per week for TP. The coefficient of variation (CV) for TP, based on effluent data, is 1.1. EPA has used the 95th percentile probability basis for the average monthly limit and the 99th percentile probability basis for the average weekly limit. This results in a ratio between the average monthly and average weekly limit of 2.62:1. Therefore, the average weekly limit is 131 µg/L.

The prior permit authorized a discharge to Plummer Creek six months out of the year (November – April). The lagoon WWTP's average effluent TP load was 4.78 lb/day. Thus, the prior permit authorized the City to discharge roughly 861 lb of TP per year (4.78 lb/day × 180 days = 861 lb).

The draft permit proposes to authorize a discharge to Plummer Creek year-round. The average monthly TP load limit in the draft permit is 0.133 lb/day. Thus, the draft permit would authorize the City to discharge up to 48.5 lb of TP per year (0.133 lb/day × 365 days = 48.5 lb). This is about 5.6% of the TP load that was authorized by the prior permit on an annual basis. That is to say, the TP effluent limits in the proposed permit would require a 94.4% reduction relative to the TP load that was authorized by the City's prior permit, in spite of the fact that the draft permit would authorize a discharge to Plummer Creek year-round.

Total Nitrogen

As explained below, EPA has determined that the TP effluent limits discussed above are adequate to ensure compliance with the Coeur d'Alene Tribe's narrative water quality criterion for nutrients. Thus, except for ammonia, the nitrogen present in the effluent does not have the reasonable potential to cause or contribute to excursions above water quality standards, and no effluent limits are proposed for total nitrogen (TN).

The nutrient limits are being established in the permit to control eutrophication in Plummer Creek, Lake Chatcolet and Lake Coeur d'Alene. Phosphorus is generally the limiting nutrient (i.e., the nutrient that controls primary productivity) in freshwaters, and particularly in lakes and reservoirs. This is because blue-green algae can "fix" elemental nitrogen from the air as a nutrient source and thereby grow in a low-nitrogen environment (EPA 1999b), and because freshwater lakes, reservoirs, rivers, and streams are generally supported by large watershed areas, which capture, accumulate, and mobilize large amounts of nitrogen relative to phosphorus (Paerl 2009). Eutrophication in lakes and reservoirs is generally controlled by the phosphorus concentration, even in cases of low nitrogen-to-phosphorus ratios, which would seem to suggest limitation by nitrogen (Reynolds 2001, Schindler 1974, 1977, 2008, Smith 1982). The TP limits in the draft permit are lower than the concentrations of TP observed in the receiving water, thus, the TP limits will reduce the TP concentration in the receiving water, which will increase the TN:TP ratio and in turn cause productivity to be more strongly limited by TP as opposed to TN.

Because primary productivity in the receiving waters is likely controlled by phosphorus rather than nitrogen, effluent limits on phosphorus will be adequate to ensure compliance with the Coeur d'Alene Tribe's narrative water quality criterion for nutrients, and effluent limits for total nitrogen are not necessary. However, effluent limits for ammonia are necessary to ensure compliance with numeric water quality criteria for ammonia.

Five-day Biochemical Oxygen Demand and Dissolved Oxygen

A DO sag analysis for the discharge found that, with an effluent BOD concentration of 15 mg/L, there is no DO sag but rather immediate reaeration of Plummer Creek (Bartelsen 2006). Therefore, EPA has established a water quality-based effluent limit for BOD_5 of 15 mg/L, as an average weekly limit. NPDES regulations require that effluent limitations for POTWs that discharge continuously be expressed as average monthly and average weekly discharge limitations, unless impracticable (40 CFR 122.45(d)(2)). Consistent with the technology-based effluent limits for BOD_5, the average monthly limit is equal to two thirds of the average monthly limit, or 10 mg/L. This accounts for effluent variability within a calendar month.

Temperature

The Reservation WQS include temperature water quality criteria for protection of cutthroat trout. The criteria are as follows: "The 7 day average of the daily maximum temperatures is not to exceed: (A) 14° C from February 1 to June 30; with no single daily maximum temperature over 18° C. (B) 18° C from July 1 to January 31; with no single daily maximum over 21° C. According to the permit application, the maximum summer temperature for the new facility's outfall 001-B is 16 °C, and the maximum winter temperature is 10 °C. The maximum winter effluent temperature is less than the water quality criteria for February – June, and the maximum summer effluent temperature is less than the water quality criteria for July – January.

The temperature water quality criteria in the TAS WQS only address the temperature of Lake Coeur d'Alene. EPA does not expect that the City of Plummer discharge will have any effect upon the temperature of Lake Coeur d'Alene. Furthermore, according to the permit application, the maximum summer temperature for the new facility's outfall 001-B is 16 °C, which is the same temperature as the numeric criterion that applies to the hypolimnion of Lake Coeur d'Alene from June through September (TAS WQS Section 19 paragraph 4(a)(iii)).

Thus, the discharge does not have the reasonable potential to cause or contribute to excursions above water quality standards for temperature and no effluent limits are proposed for temperature (40 CFR 122.44(d)(1)(i – iii)).

Floating Solids and Oil and Grease

The Tribe has a narrative water quality criterion which reads "all waters shall be free from visible oils, scum, foam, grease, and other floating materials and suspended substances of a persistent nature" except those from natural causes (see both the Reservation and TAS WQS at section 5, paragraph 1). This criterion has been included in the permit as a narrative effluent limit.

Mass-Based Limits

Effluent limits are generally calculated on a concentration basis. However, the federal regulation at 40 CFR 122.45(f) requires that effluent limits be expressed in terms of mass, if possible. The regulation at 40 CFR 122.45(b) requires that effluent limitations for POTWs be calculated based on the design flow of the facility. The mass based limits are expressed in pounds per day and are generally calculated as follows:

Mass based limit (lb/day) = concentration limit (mg/L) × design flow (mgd) × 8.34[3]

Summary of Effluent Limit Bases

The following table summarizes the general statutory and regulatory bases for the limits in the draft permit.

Table C-5 Summary of Effluent Limit Bases

Limited Parameter	Basis for Limit
BOD_5	Clean Water Act (CWA) Section 301(b)(1)(B), 40 CFR 122.45(f), 40 CFR 133 (technology-based, mass limits)
TSS	CWA Section 301(b)(1)(C), 40 CFR 122.44(d)(1)(vi)(A), 40 CFR 122.45(f), Coeur d'Alene Tribe Reservation Water Quality Standards (CDAT Reservation WQS) Section 5 paragraph 1 (water quality-based, mass limits, narrative water quality criteria)
Floating Solids, Oil and Grease	CWA Section 301(b)(1)(C), 40 CFR 122.44(d), CDAT Reservation WQS Section 5 paragraph 1 (water quality-based)
pH	CWA Section 301(b)(1)(C), 40 CFR 122.44(d), CDAT Reservation WQS Section 19 Paragraph 4(a) (water quality-based)
E. Coli	CWA Sections 301(b)(1)(C), 40 CFR 122.44(d), CDAT Reservation WQS Section 19 paragraph 3 (water quality-based)
Ammonia	CWA Section 301(b)(1)(C), 40 CFR 122.44(d), 40 CFR 122.45(f), CDAT TAS WQS Sections 7 and 12, EPA-822-R-99-014 (water quality-based, mass limits)
Total Phosphorus	CWA Section 301(b)(1)(C), 40 CFR 122.44(d)(1)(vi)(B), 40 CFR 122.45(f), CDAT Reservation and TAS WQS Section 5 paragraph 4 (water quality-based, mass limits, narrative water quality criteria)

D. References

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[3] 8.34 is a conversion factor equal to the density of water in pounds per gallon

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Appendix D: Reasonable Potential Calculations

The following describes the process EPA has used to determine if the discharge authorized in the draft permit has the reasonable potential to cause or contribute to a violation of water quality standards. EPA uses the process described in the *Technical Support Document for Water Quality-based Toxics Control* (EPA 1991) to determine reasonable potential.

To determine if there is reasonable potential for the discharge to cause or contribute to an exceedance of water quality criteria for a given pollutant, EPA compares the maximum projected receiving water concentration to the water quality criteria for that pollutant. If the projected receiving water concentration exceeds the criteria, there is reasonable potential, and a water quality-based effluent limit must be included in the permit. This section discusses how the maximum projected receiving water concentration is determined.

A. Mass Balance

For discharges to flowing water bodies, the maximum projected receiving water concentration is determined using the following mass balance equation:

$$C_d Q_d = C_e Q_e + C_u Q_u \qquad \text{(Equation D-1)}$$

where,

C_d = Receiving water concentration downstream of the effluent discharge (that is, the concentration at the edge of the mixing zone)
C_e = Maximum projected effluent concentration
C_u = 95th percentile measured receiving water upstream concentration
Q_d = Receiving water flow rate downstream of the effluent discharge = $Q_e + Q_u$
Q_e = Effluent flow rate (set equal to the design flow of the WWTP)
Q_u = Receiving water low flow rate upstream of the discharge (e.g. 1Q10 or 7Q10)

When the mass balance equation is solved for C_d, it becomes:

$$C_d = \frac{C_e Q_e + C_u Q_u}{Q_e + Q_u} \qquad \text{(Equation D-2)}$$

Equation D-2 can be simplified by introducing a "dilution factor,"

$$D = \frac{Q_e + Q_u}{Q_e} \qquad \text{(Equation D-3)}$$

The above equations are based on the assumption that the discharge is rapidly and completely mixed with the receiving stream, and 100% of the stream flow is available for mixing, under the State or Tribe's mixing zone policies. In this case, the critical low flow of the receiving water is zero. Therefore, no mixing zone may be authorized. If a mixing zone is not allowed, dilution is not considered when projecting the receiving water concentration and,

$$C_d = C_e \qquad \text{(Equation D-4)}$$

B. Maximum Projected Effluent Concentration

Federal regulations require that reasonable potential analyses consider the variability of the pollutant or pollutant parameter in the effluent (40 CFR 122.44(d)(1)(ii)).

To calculate the maximum projected effluent concentration for ammonia, EPA has used the procedure described in section 3.3 of the TSD, "Determining the Need for Permit Limits with Effluent Monitoring Data." In this procedure, the 99th percentile of the effluent data is the maximum projected effluent concentration in the mass balance equation.

Since there are a limited number of data points available, the 99th percentile is calculated by multiplying the maximum reported effluent concentration by a "reasonable potential multiplier" (RPM). The RPM is the ratio of the 99th percentile concentration to the maximum reported effluent concentration. The RPM is calculated from the coefficient of variation (CV) of the data and the number of data points.

The CV is defined as the ratio of the standard deviation of the data set to the mean, but when fewer than 10 data points are available, the TSD recommends making the assumption that the CV is equal to 0.6 (see TSD at Page 53).

Using the equations in section 3.3.2 of the TSD, the reasonable potential multiplier (RPM) is calculated based on the CV and the number of samples in the data set as follows. The following discussion presents the equations used to calculate the RPM, and also works through the calculations for the RPM for ammonia as an example. Reasonable potential calculations for all pollutants can be found in Table D-1.

First, the percentile represented by the highest reported concentration is calculated.

$$p_n = (1 - \text{confidence level})^{1/n} \quad \text{(Equation D-5)}$$

where,
p_n = the percentile represented by the highest reported concentration
n = the number of samples
confidence level = 99% = 0.99

The data set contains 34 ammonia samples collected from the effluent, therefore:

$$p_n = (1 - 0.99)^{1/34}$$
$$p_n = 0.873$$

This means that we can say, with 99% confidence, that the maximum reported effluent copper concentration is greater than the 87^{th} percentile.

The reasonable potential multiplier (RPM) is the ratio of the 99th percentile concentration (at the 99% confidence level) to the maximum reported effluent concentration. This is calculated as follows:

$$RPM = C_{99}/C_p \quad \text{(Equation D-6)}$$

Where,

$$C = \exp(z\sigma - 0.5\sigma^2) \quad \text{(Equation D-7)}$$

Where,
$\sigma^2 = \ln(CV^2 + 1)$ (Equation D-8)
$\sigma = \sqrt{\sigma^2}$
CV = coefficient of variation = (standard deviation) ÷ (mean)
z = the inverse of the normal cumulative distribution function at a given percentile

In the case of ammonia:

CV = coefficient of variation = 2.18
$\sigma^2 = \ln(CV^2 + 1) = 1.75$
$\sigma = \sqrt{\sigma^2} = 1.32$
z = 2.326 for the 99th percentile = 1.142 for the 87th percentile

$C_{99} = \exp(2.326 \times 1.32 - 0.5 \times 1.75) = 9.06$
$C_{90} = \exp(1.142 \times 1.32 - 0.5 \times 1.75) = 1.89$

$RPM = C_{99}/C_{87} = 9.06/1.89$
RPM = 4.80

The maximum projected effluent concentration is determined by simply multiplying the maximum reported effluent concentration by the RPM:

$C_e = (RPM)(MRC)$ (Equation D-9)

where MRC = Maximum Reported Concentration

In the case of ammonia,

$C_e = (4.80)(10.1 \text{ mg/L}) =$ **48.4 mg/L**

C. Maximum Projected Receiving Water Concentration

The discharge has reasonable potential to cause or contribute to excursions above water quality criteria if the maximum projected concentration of the pollutant is greater than the criterion. For ammonia:

$C_d = C_e = 48.4$ mg/L

The maximum projected concentration of ammonia is greater than the criteria, which are an acute criterion of 7.80 mg/L acute and a chronic criterion of 2.77 mg/L (EPA 1999) therefore, the discharge has the reasonable potential to cause or contribute to excursions above water quality standards, and an effluent limit is required.

D. References

EPA. 1991. *Technical Support Document for Water Quality-based Toxics Control.* US Environmental Protection Agency, Office of Water, EPA/505/2-90-001.

EPA. 1999. *1999 Update of Ambient Water Quality Criteria for Ammonia*. EPA-822-R-99-014. December 1999.

Table D-1: Reasonable Potential Calculations

Effluent Percentile value	99%													
		State Water Quality Standard		Max concentration at edge of...										
	Ambient Concentration (metals as dissolved)	Acute	Chronic	Acute Mixing Zone	Chronic Mixing Zone	LIMIT REQ'D?		Max effluent conc. measured (metals as total recoverable)	Coeff Variation		# of samples	Multiplier	Acute Dil'n Factor	Chronic Dil'n Factor
Parameter							*Pn*		*CV*	*s*	*n*			
Ammonia, mg/L		7.80	2.77	48.4	48.4	**YES**	0.873	10.1	2.184	1.324	34	4.80	1.00	1.00
TSS, mg/L			25.0		45.0	**YES**	N/A	45.0	N/A	N/A	N/A	1.00	1.00	1.00
Phosphorus, µg/L			50.0		2440	**YES**	N/A	2440	N/A	N/A	N/A	1.00	1.00	1.00

Appendix E: WQBEL Calculations - Aquatic Life Criteria

The following calculations demonstrate how the water quality-based effluent limits (WQBELs) in the draft permit were calculated based on two-value (acute and chronic) aquatic life criteria. The WQBELs for ammonia are derived from acute and chronic aquatic life criteria.

A. Calculate the Wasteload Allocations (WLAs)

Wasteload allocations (WLAs) are calculated using the same mass balance equations used to calculate the receiving water concentration of the pollutant in the reasonable potential analysis . To calculate the wasteload allocations, C_d is set equal to the acute or chronic criterion and the equation is solved for C_e. The calculated C_e is the acute or chronic WLA. The equation is rearranged to solve for the WLA, becoming:

$$C_e = WLA = D \times (C_d - C_u) + C_u \qquad \text{(Equation E-1)}$$

Or, if no mixing zone is allowed:

$$C_e = WLA = C_d \qquad \text{(Equation E-2)}$$

Effluent limit calculations for ammonia did not use a mixing zone.

In the case of ammonia, for the acute criterion,

WLA_a = 7.80 mg/L

For the chronic criterion,

WLA_c = 2.77 mg/L

The next step is to compute the "long term average" concentrations which will be protective of the WLAs. This is done using the following equations from Chapter 5 of EPA's *Technical Support Document for Water Quality-based Toxics Control* (TSD):

$$LTA_a = WLA_a \times \exp(0.5\sigma^2 - z\,\sigma) \qquad \text{(Equation E-3)}$$
$$LTA_c = WLA_c \times \exp(0.5\,\sigma_{30}^2 - z\,\sigma_{30}) \qquad \text{(Equation E-4)}$$

where,

$\sigma^2 = \ln(CV^2 + 1)$

$\sigma = \sqrt{\sigma^2}$

$\sigma_{30}^2 = \ln(CV^2/30 + 1)$

$\sigma_{30} = \sqrt{\sigma_{30}^2}$

z = 2.326 for 99th percentile probability basis

In the case of ammonia,

$\sigma^2 = \ln(2.18^2 + 1) = 1.75$

$\sigma = \sqrt{\sigma^2} = 1.32$

$\sigma_{30}^2 = \ln(2.18^2/30 + 1) = 0.147$

$\sigma_{30} = \sqrt{\sigma_{30}^2} = 0.383$

z = 2.326 for 99th percentile probability basis

Therefore,

$LTA_a = 7.80 \text{ mg/L} \times \exp(0.5 \times 1.75 - 2.326 \times 1.32)$
$LTA_a = 0.86$ mg/L

$LTA_c = 2.77 \text{ mg/L} \times \exp(0.5 \times 0.147 - 2.326 \times 0.383)$
$LTA_c = 1.22$ mg/L

The LTAs are compared and the more stringent is used to develop the daily maximum and monthly average permit limits as shown below. For ammonia, the acute LTA of 0.86 mg/L is more stringent.

B. Derive the maximum daily and average monthly effluent limits

Using the TSD equations (section 5.4.1), the MDL and AML effluent limits are calculated as follows:

$MDL = LTA \times \exp(z_m \sigma - 0.5 \sigma^2)$ (Equation E-5)
$AML = LTA \times \exp(z_a \sigma_n - 0.5 \sigma_n^2)$ (Equation E-6)

where σ and σ^2 are defined as they are for the LTA equations (E-3 and E-4) and,

$\sigma_n^2 = \ln(CV^2/n + 1)$
$\sigma = \sqrt{\sigma_n^2}$
$z_a = 1.645$ for 95th percentile probability basis
$z_m = 2.326$ for 99th percentile probability basis
n = number of sampling events required per month (minimum of 4)

In the case of ammonia,

$MDL = 0.86 \text{ mg/L} \times \exp(2.326 \times 1.32 - 0.5 \times 1.75)$
MDL = 7.80 mg/L

$AML = 0.86 \text{ mg/L} \times \exp(1.645 \times 0.885 - 0.5 \times 0.783)$
AML = 2.50 mg/L

C. References

EPA. 1991. *Technical Support Document for Water Quality-based Toxics Control.* US Environmental Protection Agency. Office of Water. EPA/505/2-90-001. March 1991.

EPA. 1999. *1999 Update of Ambient Water Quality Criteria for Ammonia*. EPA-822-R-99-014. December 1999.

Appendix F: Endangered Species Act and Essential Fish Habitat

Section 7 of the Endangered Species Act (ESA) requires federal agencies to request a consultation with the National Oceanic and Atmospheric Administration (NOAA) Fisheries and the US Fish and Wildlife Service (USFWS) regarding potential effects that a federal action may have on listed endangered and threatened species.

The subject discharge is located in Benewah County, Idaho. The USFWS species list for Benewah County lists the following threatened and endangered species and critical habitat:

- Bull trout (*Salvelinus confluentus*) listed threatened
- Bull trout critical habitat
- Spalding's catchfly (*Lepidium papilliferum*) listed threatened
- Water howellia (*Howellia aquatilis*) listed threatened
- Canada lynx (*Lynx canadensis*) listed threatened

EPA has determined that the issuance of an NPDES permit to the City of Plummer WWTP will have no effect on bull trout, bull trout critical habitat, Spalding's catchfly, water howellia, or the Canada lynx.

The U.S. Fish and Wildlife Service Draft Bull Trout Recovery Plan (USFWS 2002) identified causes of the bull trout listing. They are operation and maintenance of dams and other diversion structures, forest management practices, livestock grazing, agriculture, agricultural diversions, road construction and maintenance, mining, and introduction of nonnative species. No sewage treatment plant is identified as a contributing factor to the decline in bull trout.

In addition, there are site-specific factors supporting EPA's no effect determination. Plummer Creek is not designated for bull trout use in the Coeur d'Alene Tribe's water quality standards. Plummer Creek is not designated as bull trout critical habitat. The treatment plant is an extended aeration activated sludge facility with biological phosphorus removal and filtration, which is expected to produce a high quality effluent. Expected effluent quality is provided in Table 1, below. The facility is required to meet water quality criteria for ammonia, phosphorus, E. coli, and pH at the end-of-pipe. The facility has ultraviolet disinfection, and the permit prohibits the use of chlorine for disinfection or elsewhere in the treatment process. Therefore, the facility is not expected to discharge chlorine in significant amounts. The water quality-based effluent limits for BOD_5 will ensure compliance with water quality standards for dissolved oxygen.

Table 1: Expected Effluent Quality for the City of Plummer WWTP

Parameter	Concentration	Source
BOD_5	10 mg/L	Effluent Limit
TSS	17 mg/L	Effluent Limit
Ammonia as N	2.50 mg/L	Effluent Limit
Total Phosphorus as P	0.05 mg/L	Effluent Limit
pH	6.5 – 8.5 s.u.	Effluent Limit
Temperature (summer)	16 °C	Permit Application
Temperature (winter)	10 °C	Permit Application

Lake Coeur d'Alene, downstream from the discharge, is designated bull trout critical habitat, however, because of the stringent effluent limits applicable to this discharge described above, the discharge will not affect downstream critical habitat.

The plant will produce a very high-quality effluent, with pollutant concentrations either expected or required to ensure compliance with water quality standards at the end-of-pipe. Effluent limits for total phosphorus and TSS are less than the maximum concentrations of these parameters measured in the receiving water upstream from the discharge. Therefore, threatened and endangered aquatic species will not be exposed to elevated pollutant concentrations as a result of the discharge, and the discharge will have no effect on bull trout or bull trout critical habitat. Furthermore, for these reasons, the discharge will not adversely affect essential fish habitat.

EPA has determined that the issuance of an NPDES permit to the City of Plummer WWTP will have no effect on water howellia. The plant roots in bottom sediments of low-elevation ponds or sloughs. Despite extensive surveys, only one population of water howellia is known in Idaho, occupying three ponds in Latah County (Mincemoyer 2005). There is no indication that water howellia occur near Plummer Creek or downstream waters. Even if water howellia are present near Plummer Creek or waters downstream from the discharge, the discharge does not pose a threat to water howellia. The threats to water howellia include destruction, modification, or curtailment of its habitat or range by a number of human-related factors including timber harvest activities, livestock grazing, invasion by non-native plant species, outright conversion of habitat to other uses, road construction and maintenance, and military training exercises; overutilization for commercial, recreational, scientific, or educational purposes; disease or predation; and natural factors including narrow ecological requirements, lack of genetic variation, climate change, and natural wetland succession (USFWS 1996).

EPA has determined that the issuance of an NPDES permit to the City of Plummer WWTP will have no effect on Canada lynx or Spalding's catchfly. These are terrestrial species, which are generally not susceptible to the water quality impacts that may result from the issuance of an NPDES permit.

The primary causes of the Canada lynx's decline are habitat destruction, overutilization for commercial, recreational, scientific, or educational purposes, and climate change (USFWS 2005). Issuance of an NPDES permit to the City of Plummer WWTP will have no effect on any of the factors causing the decline of the Canada lynx. Therefore, the issuance of this permit will have no effect on the Canada lynx.

The primary causes of the Spalding's catchfly's decline are nonnative invasive plants, habitat fragmentation, changes in the fire regime and fire effects, land conversion associated with urban and agricultural development, livestock and wildlife grazing and trampling, herbicide and insecticide spraying, off-road vehicle use, insect damage and disease, impacts from prolonged drought and climate change, and the inadequacy of existing regulatory mechanisms (USFWS 2007). Issuance of an NPDES permit to the City of Plummer WWTP will have no effect on the factors causing the decline of the Spalding's catchfly. Therefore, the issuance of this permit will have no effect on the Spalding's catchfly.

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US Fish and Wildlife Service. 2005. "Recovery Outline for the Contiguous United States Distinct Population Segment of the Canada Lynx."

U.S. Fish and Wildlife Service. 2007. Recovery Plan for Silene spaldingii (Spalding's Catchfly). U.S. Fish and Wildlife Service, Portland, Oregon. xiii + 187 pages.