Fact Sheet

Public Comment Start Date: June 20, 2007
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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 St. Maries
Wastewater Treatment Plant
602 College Avenue
St. Maries, ID 83861

EPA Proposes To Reissue NPDES Permit

EPA proposes to reissue the 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

401 Certification

EPA is requesting that the Coeur d'Alene Tribe certify the NPDES permit for this facility, under Section 401 of the Clean Water Act. Comments regarding the certification should be directed to:

Attn: Scott Fields
Coeur d'Alene Tribe
Lake Management Department
850 A Street, P.O. Box 408
Plummer, Idaho 83851

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:

United States Environmental Protection Agency
Idaho Operations Office
1435 North Orchard
Boise, Idaho 83706
(208) 378-5746

Coeur d'Alene Tribe
Lake Management Department
410 Anne Antelope Road
Plummer, Idaho 83851
(208) 686-0252

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Acronyms

1Q10	1 day, 10 year low flow
7Q10	7 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.
ACR	Acute-to-Chronic Ratio
AML	Average Monthly Limit
ASR	Alternative State Requirement
AWL	Average Weekly Limit
BA	Biological Assessment
BAT	Best Available Technology economically achievable
BCT	Best Conventional pollutant control Technology
BE	Biological Evaluation
BO or BiOp	Biological Opinion
BOD_5	Biochemical oxygen demand, five-day
BOD_u	Biochemical oxygen demand, ultimate
BMP	Best Management Practices
BPT	Best Practicable
^0C	Degrees Celsius
CBOD	Carbonaceous Biochemical Oxygen Demand
CDT	Coeur d'Alene Tribe
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
COD	Chemical Oxygen Demand
CSMWWTP	City of St. Maries Wastewater Treatment Plant
CV	Coefficient of Variation
CWA	Clean Water Act
DMR	Discharge Monitoring Report
DO	Dissolved oxygen
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement

EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FDF	Fundamentally Different Factor
FR	Federal Register
Gpd	Gallons per day
HUC	Hydrologic Unit Code
IC	Inhibition Concentration
IDEQ	Idaho Department of Environmental Quality
I/I	Infiltration and Inflow
LA	Load Allocation
lbs/day	Pounds per day
LTA	Long Term Average
LTCP	Long Term Control Plan
mg/L	Milligrams per liter
Ml	Milliliters
ug/L	Micrograms per liter
Mgd	Million gallons per day
MDL	Maximum Daily Limit or Method Detection Limit
N	Nitrogen
NEPA	National Environmental Policy Act
NOAA	National Oceanic and Atmospheric Administration
NOEC	No Observable Effect Concentration
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NSPS	New Source Performance Standards
OWW	Office of Water and Watersheds
O&M	Operations and maintenance
PCS	Permit Compliance System
POTW	Publicly owned treatment works
QAP	Quality assurance plan
RP	Reasonable Potential
RPM	Reasonable Potential Multiplier

RWC	Receiving Water Concentration
SIC	Standard Industrial Classification
SPCC	Spill Prevention and Control and Countermeasure
SS	Suspended Solids
SSO	Sanitary Sewer Overflow
s.u.	Standard Units
TKN	Total Kjeldahl Nitrogen
TMDL	Total Maximum Daily Load
TRC	Total Residual Chlorine
TRE	Toxicity Reduction Evaluation
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
UV	Ultraviolet
WET	Whole Effluent Toxicity
WLA	Wasteload allocation
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 St. Maries Waste Water Treatment Plant

NPDES Permit # ID-002279-9

Physical Address:
1 Mile West of City of St. Maries
St. Maries, Idaho

Mailing Address:
602 College Avenue
St. Maries, Idaho 83861

Contact:
Fred Argelan
Wastewater Treatment Plant Operator
(208) 245-4102

II. Facility Information

The City of St. Maries Wastewater Treatment Plant (CSMWWTP) is located 1 mile west of the City of St. Maries, in Benewah County, Idaho. Based on the Gazette Record, a community newspaper, at its website: www.stmariesidaho.com (on March 27, 2007), the City of St. Maries has a population of approximately 2800 residents, and the city is the county seat of Benewah County.

The point of discharge at the outfall is within the boundaries of the Coeur d'Alene Reservation, located approximately 1 mile west of the City of St. Maries, on the St. Joe River and down river from the confluence of the St. Joe and St. Maries Rivers. The City of St. Maries WWTP is a Publicly Owned Treatment Works (POTW), with secondary treatment, that is owned and operated by the City of St. Maries, a non-tribal entity.

According to an EPA inspection report dated August 4, 1997, the treatment works consists of lagoons followed by chlorination and either land treatment via two center-pivoted irrigation systems or effluent discharged to outfall. Waste water is pumped from two pump stations (2nd Street and 14th Street Stations) located south of the St. Joe River to two primary lagoons on the north side of the river. Each of these lagoons is 12 acres in area and about 6 feet deep, with a capacity of approximately 23 million gallons each. The flow is conducted by force mains; one force main flows directly into the north east lagoon, and the other three force mains flow into a re-circulating distribution box to be distributed into the lagoons via the raw sewage distribution box. The flow is then directed back across the St. Joe River to the south into a polishing/storage lagoon. The polishing/storage lagoon is a 24-acre pond with an approximate capacity of 39 million gallons, which has a longitudinal dike extending most of the lagoon to increase detention time and to eliminate short-circuiting of the flow. Disinfection occurs in a chlorine

contact tank with capacity of approximately 59,000 gallons. Land application is conducted at two center-pivoted irrigation systems, each with 1100-foot radius covering a total of approximately 175 acres. When land application is not conducted, effluent is discharged at the outfall. The location of the outfall is at the St. Joe River with the following latitude and longitude: 47° 19' 45.2" North, 116° 35' 30.7" West. A map showing the location of the facility is found in Appendix B.

The St. Joe River is located in the St. Joe River Subbasin, a large watershed composed of both the St. Joe River and the St. Maries River. The St. Joe River and its tributaries drain the entire watershed above the confluence with the St. Maries River at the city of St. Maries. Concerning listed Total Maximum Daily Loads (TMDLs) at the St. Joe River, the Idaho Department of Environmental Quality (IDEQ) website stated that the "St. Joe River itself is not listed, nor was it found to be impaired"; this means that the St. Joe River is not listed under Section 303(d) of the Clean Water Act. The IDEQ designated this area of the St. Joe River as having the following uses in IDAPA 58.01.02.110.11 (Unit P-5): For aquatic life - Cold Water Communities; and, for Primary Contact Recreation.

On August 23, 2006, EPA sent a letter to the U.S. Fish and Wildlife Service (FWS), and an e-mail to the National Oceanic and Atmospheric Agency (NOAA) requesting information concerning threatened or endangered species in the St. Joe River in the vicinity of this municipal WWTP. On August 23, 2006, Mr. Ed Murrell from NOAA responded by e-mail confirming that there are no listed endangered species and no threatened species in this area. On March 28, 2007, Scott Fields of the CDT informed EPA that Bull Trout exists in the St. Joe River.

According to Marla Schalls (the facility's former waste water treatment plant operator) via telephone on November 7, 2006, the outfall discharge pipe is not equipped with a diffuser and confirmed that the facility within the descriptions in the permit application that it has not been accepting wastewater from any significant industrial users or receives RCRA or CERCLA wastes.

On March 21, 2007, EPA held a meeting with the CSMWWTP operator and conducted a site visit as part of this NPDES Permit reissuance. According to Fred Argelan, the waste water treatment plant operator, the City is in the process of initiating a sewer line inflow and infiltration study that is being conducted by their contractor, Welsh Comer and Associates, Inc. EPA verified the existence of the City's two primary lagoons on the North side of the St. Joe River, and the Polishing lagoon on the South side of the St. Joe River. The field where land application takes place was used for growing hay. By analyzing the area map with a geographical information system program, the river is determined by EPA to be approximately 312 feet wide near the point of discharge. In the meeting with Fred Argelan, EPA discussed the NPDES Permitting process leading to the reissuance of the NPDES Permit for the City of St. Maries Waste Water Treatment Plant. Mr. Argelan also agreed that the CSMWWTP is located and discharges within the boundaries of the Coeur d'Alene tribal reservation.

Pursuant to previous permit conditions, the facility was required to submit monthly Discharge Monitoring Reports (DMRs) to EPA and the Idaho Department of Environmental Quality (IDEQ).

The CSMWWTP's previous NPDES Permit was modified on November 16, 1987, and had expired on November 16, 1992. The following are effluent limits and monitoring requirements from the previously modified permit (11/16/87):

Table 1: Effluent Limitations from the previously modified Permit

Effluent Characteristics	Units	Monthly Average	Weekly Average	Daily Maximum
BOD_5	mg/l (lbs/day)	45 (280)	65 (420)	---
TSS	Mg/l	70	105	---
Fecal Coliform Bacteria	number/100 ml	50	100	---
Total Residual Chlorine	Mg/l	---	---	2.0
pH	Shall not be less than 6.0, nor greater than 9.0			
Percent Removal for BOD_5	For any month, the monthly average effluent load shall not exceed 35% of the monthly average influent load.			
Discharge	There shall be no discharge of floating solids or visible foam in other than trace amounts. Stored effluent shall not be released instantaneously and shall be discharged at a rate not to exceed 2.0 mgd. There shall be no discharge between July 1 and October 31.			

Table 2: Monitoring Requirements from the previously modified permit

Parameter	Units	Sample Location	Sampling Frequency	Type of Sampling
Total Flow	mgd	Effluent	Continuous	Recording
BOD_5	mg/l & lbs/day	Influent and Effluent	1/week	Grab
TSS	mg/l	Effluent	1/week	Grab
pH	s.u.	Effluent	5/week	Grab
Fecal Coliform Bacteria	Number/100 ml	Effluent	1/week	Grab
Total Residual Chlorine	mg/l	Effluent	5/week	Grab

In the City of St. Maries Waste Water Treatment Plant's NPDES Permit Application dated January 30, 2006, the facility reported the following information:

- The facility had a design flow rate of 2.0 million gallons per day (mgd) capacity.
- The facility is requesting to renew its NPDES permit for seasonal discharge for 8 months per year from November 1 to June 30.
- For the 8 months of discharge per year, the annual average daily flow rate was 0.21 mgd in 2003; 0.26 mgd in 2004.
- For the 8 months of discharge per year, the maximum daily flow rate was 1.87 mgd in 2003; and 1.87 mgd in 2004.
- The facility's collection system is only from separate sanitary sewer. No contribution from a combined storm and sanitary sewer collection was indicated.
- The facility land-applies treated waste water at a location that is adjacent to the CSMWWTP, on 175 acres, at an annual average daily volume of application at 0.769 mgd intermittently from July 1 to October 31.
- The facility does not discharge or transport treated or untreated waste water to another treatment works.
- The facility treats waste with both primary and secondary treatment.
- The facility uses chlorination for disinfection of effluent, but does not utilize dechlorination, and does not utilize post aeration.
- Based on 6 months of data from 2005, the facility reported the following effluent testing information:

  Minimum pH: 6.36 s.u.

  Maximum pH: 8.40 s.u.

  Maximum daily flow rate: 1.65 mgd

  Average Daily Value flow rate: 0.593 mgd

  Temperature of effluent - Maximum Daily value (Winter): 5.8 degrees C (Nov)

  Temperature of effluent - Maximum Daily value (Summer): 16.7 degrees C (June)

  Biochemical Oxygen Demand (BOD5): maximum daily discharge, 27.1 mg/l;

  BOD5: average daily discharge, 14.04 mg/l.

  Total Suspended Solids (TSS): maximum daily discharge, 30.8 mg/l;

  TSS: average daily discharge, 14.06 mg/l.
- Inflow and Infiltration (I/I) rate: 530,000 gallons per day
- Expanded Effluent Testing as required by the Permit Application showed that: there were trace amounts of metals, cyanide, and phenols; and, no volatile organic compounds and base-neutral compounds were detected. Effluent hardness (as Calcium Carbonate) was measured at 61.2 mg/l.

EPA had consulted with the CDT concerning the reissuance of the draft NPDES Permit for discharges in its reservation from the CSMWWTP. The CDT has provided a Preliminary Clean Water Act Sec. 401 Certification for the draft NPDES Permit. The preliminary certification provided by the CDT also had the following special note:

> *"The summertime wastewater land application associated with this facility is also of concern to the Tribe and the Tribe has requested further consultation with EPA and the City on this issue to ascertain if an additional NPDES permit is needed during this time period."*

III. Receiving Water

This facility discharges to the St. Joe River, which is within the boundaries of the Coeur d'Alene Reservation.

A. Low Flow Conditions

The *Technical Support Document for Water Quality-Based Toxics Control* (hereafter referred to as the TSD) (EPA, 1991) and the Idaho 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 Idaho 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. These flow rates were determined from data obtained from the U.S. Geological Survey (USGS). The location of this WWTP on the St. Joe River is such that it is located down river from the confluence of the St. Maries River and the St. Joe River. Given the availability of data, the low flows in Table 1 were calculated from the USGS data that was combined from stations above the river confluence, by combining the data from the Calder station on the St. Joe River, and data from the Santa station on the St. Maries River.

Table 3: Seasonal Low Flows in the St. Joe River at the Point of Discharge during discharge period

Discharge Period	1Q10 (CFS)	7Q10 (CFS)	30B3 (CFS)
November through June	207	268	326

B. Water Quality Standards

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. 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'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 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.

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 Appendix C.

B. Proposed Effluent Limitations

Below are the proposed effluent limits in the draft permit.

1. The permittee must not discharge floating, suspended, or submerged matter of any kind in concentrations causing nuisance or objectionable conditions or that may impair designated beneficial uses.
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. Table 4 (below) presents the proposed average monthly, average weekly, maximum daily, and instantaneous maximum effluent limits.

Table 4: Proposed Effluent Limits for Discharge from November 1 to June 30

Parameter	Units	Effluent Limits			
		Average Monthly Limit	Average Weekly Limit	Max. Daily Limit	Instant-aneous Max. Limit
Five-Day Biochemical Oxygen Demand[5,6] (BOD_5)	mg/l	30	45	---	---
	lb/day	500[6]	751[6]	---	---
	% removal	85% (min)[5]	—	---	---
Total Suspended Solids (TSS)[5,6]	mg/L	30	45	---	---
	lb/day	500[6]	751[6]	---	---
	% removal	85% (min)[5]	—	---	---
E. Coli Bacteria[1,2]	#/100 ml	126[1]	---	---	406[2]
pH	s.u.	6.5 to 8.5			
Total Residual Chlorine(Final)[3]	mg/l	0.233	---	0.305[2]	---
	lb/day	3.9	---	5.1[2]	---
Total Residual Chlorine (Interim)[4]	mg/l	0.5	0.75	---	---
	lb/day	8.34	12.51		

Table 4: Proposed Effluent Limits for Discharge from November 1 to June 30					
		Effluent Limits			
Parameter	**Units**	**Average Monthly Limit**	**Average Weekly Limit**	**Max. Daily Limit**	**Instant-aneous Max. Limit**

1. Average Monthly Limit for E. coli: The permittee must report the geometric mean for e-coli concentration. If any value used to calculate the geometric mean is less than 1, the permittee must round that value up to 1 for purposes of calculating the geometric mean. Based on a minimum of five (5) samples taken every three (3) to seven (7) days over a thirty (30) day period.
2. Reporting is required within 24 hours of a maximum daily limit or instantaneous maximum limit violation.
3. Final limits apply immediately after interim limits have expired, after the third year of the permit.
4. Interim limits apply during the first three years of the permit.
5. Percent removal is calculated using the following equation:
   (average monthly influent – average monthly effluent) ÷ average monthly influent
6. Loading is calculated by multiplying the concentration in mg/L by the average daily flow for the day of sampling in mgd and a conversion factor of 8.34. If the concentration is measured in µg/L, the conversion factor is 0.00834. For more information on calculating, averaging, and reporting loads and concentrations see the NPDES Self-Monitoring System User Guide (EPA 833-B-85-100, March 1985).

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) or 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. The City of St. Maries WWTP has 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 5 below, are the proposed effluent monitoring requirements for the permittee's requested discharge period from November 1 to June 30. The sampling location must be after the last treatment unit and prior to discharge to the receiving water. The monitoring samples must not be influenced by combination with other effluent. If no discharge occurs during the reporting period, "no discharge" shall be reported on the DMR.

Table 5: Proposed Effluent Monitoring Requirements from November 1 to June 30

Parameter	Units	Sample Location	Sample Frequency	Sample Type
Flow	Mgd	Effluent	Continuous	Recording
BOD_5	mg/L	Influent & Effluent	1/week	24-hour composite
	lb/day	Influent & Effluent	1/week	calculation[1]
	% Removal	--	--	calculation[2]
TSS	mg/L	Influent & Effluent	1/week	24-hour composite
	lb/day	Influent & Effluent	1/week	calculation[1]
	% Removal	--	--	calculation[2]
pH	Standard units	Effluent	5/week	Grab
E. coli Bacteria[4,8]	#/100 ml	Effluent	5/month[4]	Grab
Total Residual Chlorine[8]	mg/L	Effluent	5/week	Grab
	Lb/day	Effluent		calculation[1]
Total Ammonia[9] as N	mg/L	Effluent	1/week	24-hour composite
Orthophosphate as P	mg/l	Effluent	2/year[10]	24-hour composite
Total Kjeldahl Nitrogen	mg/l	Effluent	1/month	24-hour composite
Nitrate-Nitrite as N	mg/l	Effluent	1/month	24-hour composite
Hardness	Mg/L as $CaCO_3$	Effluent	1/bi-monthly	24-hour composite
Alkalinity	Mg/L as $CaCO_3$	Effluent	1/bi-monthly	24-hour composite
Dissolved Oxygen	mg/l	Effluent	1/month	Grab
Total Phosphorus[9] as P	mg/l	Effluent	1/month	24-hour composite
Temperature	Degrees C	Effluent	1/week	Grab
NPDES Application Form 2A Effluent Testing Data[5]	mg/l	Effluent	3x/5 years[5]	See footnote 5
NPDES Application Form 2A Expanded Effluent Testing[6]	---	Effluent	3x/5 years[6]	See footnote 6
NPDES Application Form 2A Toxicity Testing Data [7]	TUc	Effluent	4x/5 years[7]	See footnote 7

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 – average monthly effluent) ÷ average monthly influent.
3. Since discharge is only permitted from November 1 to June 30th, "bi-monthly" is defined as: November to December; January to February; March to April; and, May to June. "Monthly" is defined as once a month from November to June. "Weekly" is defined as once a week from November to June.
4. Geometric Mean Criterion: Based on a minimum of five (5) samples taken every three (3) to seven (7) days over a thirty (30) day period.
5. For Effluent Testing Data, in accordance with instructions in NPDES Application Form 2A, Part B.6, and where each test is conducted in a separate permit year during the permitted discharge period for the first three years of the permit cycle.
6. For Expanded Effluent Testing, in accordance with instructions in NPDES Application Form 2A, Part D, and where each test is conducted in a separate permit year during the permitted discharge period for the first three years of the permit cycle.
7. For Toxicity Testing Data, in accordance with instructions in NPDES Application Form 2A, Part E, and where each test is conducted in a separate permit year during the permitted discharge period for the first four years of the permit cycle.
8. Reporting is required within 24 hours of a maximum daily limit or instantaneous maximum limit violation.
9. The maximum ML for Total Ammonia is 0.05 mg/l, and the maximum ML for Total Phosphorus is 0.01 mg/l.

C. Surface Water Monitoring

Table 6 presents the proposed receiving (surface) water monitoring requirements for the draft permit. The City of St. Maries WWTP should conduct surface water monitoring at the St. Joe River, at the locations indicated. The acceptable upstream sampling location must be outside the influence of the effluent stream; an acceptable downstream sampling location would be where the effluent stream is completely mixed with the receiving water. EPA proposed in the draft permit that acceptable surface water sampling locations must be reviewed by the CDT prior to initial sampling. Surface water monitoring results for the previous permit year must be submitted with the January DMR.

Table 6: Proposed Receiving Water Monitoring Requirements

Parameter (units)	Sample Locations	Sample Frequency	Sample Type	Minimum Level (ML)
pH (s.u.)	Upstream	3/year[1]	Grab	---
Temperature, (ºC)	Upstream	3/year[1]	Grab	---
Total Ammonia as N (mg/L)	Upstream	3/year[1]	Grab	0.05 mg/l
Hardness (mg/L as $CaCO_3$)	Upstream	3/year[1]	Grab	---
Alkalinity (mg/L as $CaCO_3$)	Upstream	3/year[1]	Grab	---
Dissolved Oxygen (mg/l)	Upstream & Downstream	3/year[1]	Grab	---
Total Phosphorus as P (mg/l)	Upstream & Downstream	3/year[1]	Grab	0.01 mg/l

1. Since discharge is only permitted from November to June, 3/year sampling frequency is defined as for the months of December, February, and May of each year.

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. CSMWWTP is required to update the Quality Assurance Plan for the WWTP within 90 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 WWTP 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 90 days of the effective date of the final permit. The plan shall be retained on site and made available to EPA, and CDT upon request.

C. Pretreatment Requirements

The facility certified in its permit application that it does not receive Industrial User Discharges and RCRA/CERCLA Wastes; therefore, no pretreatment requirements are proposed in the draft permit. In addition, the design flow of the treatment plant is less than 5 mgd, therefore, EPA does not believe it is necessary to develop a pretreatment program for EPA's approval at this time. However, the permit contains conditions requiring that the facility monitor and control industrial users.

D. Standard Permit Provisions

Sections II, III, and IV 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.

E. Total Chlorine Schedule of Compliance

To meet the proposed Total Chlorine effluent limits in the proposed permit, the permittee may be required to perform plant upgrades. Therefore, EPA proposes a compliance schedule in order for that the permittee to meet these effluent limits. EPA proposes that the permittee must achieve compliance with the proposed Total Residual Chlorine limitations in Table 4, by three years from the effective date of the permit. In the interim, the following effluent limits must be met:

Average Monthly Limit: 0.5 mg/l

Average Weekly Limit: 0.75 mg/l

Until compliance with the effluent limits is achieved, EPA proposes that at a minimum, the permittee must complete the tasks:

1. One year after the effective date of the permit, the permittee selects the measures to enable compliance with the chlorine effluent limits. Within 14 days of selecting the measures, notify EPA and CDT in writing of the selected measures.

2. Submit an annual Report of Progress which outlines the progress made towards reaching the compliance date for the chlorine effluent limitations. The annual Report of Progress must be submitted annually. The first report is due one year after the effective date of the permit, and every 12 months thereafter, until compliance with the chlorine effluent limits is achieved. At a minimum, the Report of Progress must include:

a. An assessment of the previous 12 months of chlorine data and a comparison to the effluent limitations.

b. A report on progress made towards meeting the effluent limitations.

c. Further actions and milestones targeted for the upcoming 12 months.

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 issuance of this permit will not affect any threatened or endangered species in the vicinity of the discharge. On August 23, 2006, EPA sent a letter to the U.S. Fish and Wildlife Service (FWS), and sent an e-mail to the National Oceanic and Atmospheric Agency (NOAA) requesting information concerning threatened or endangered species in the St. Joe River in the vicinity of this municipal WWTP. On August 23, 2006, Mr. Ed Murrell from NOAA responded by e-mail confirming that there are no listed endangered species and no threatened species in this area.

B. Essential Fish Habitat

Essential fish habitat (EFH) includes 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. The EFH regulations define an adverse effect as any impact which reduces quality and/or quantity of EFH and may include direct (e.g. contamination or physical disruption), indirect (e.g. loss of prey, reduction in species' fecundity), site specific, or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions. In an e-mail dated August 23, 2006, Mr. Ed Murrell from NOAA responded by e-mail confirming that there are no listed endangered species and no threatened species in this area. EPA has determined that the issuance of the draft permit will not affect any EFH species in the vicinity of the discharge. Therefore further consultation is not required for this permit.

C. Certification by the Coeur d'Alene Tribe

The state in which the discharge originates is typically responsible for issuing the certification pursuant to CWA Section 401(a)(1). In the case where the state has no authority to give 401 certification, such as for a discharge located within the boundaries of an Indian Reservation, EPA or the tribal authority provides the certification. Indian Tribes may issue 401 certification for discharges within their boundaries if the Tribe has been approved by the EPA pursuant to CWA Section 518(e) and 40 CFR Section 131.8 to administer a water quality standards program. In this case, the point of discharge of the outfall is located within boundaries of the Coeur d'Alene Indian Reservation. The Coeur d'Alene Tribe (CDT) has also been recognized federally to administer a water quality

standards program, and has designated its tribal governmental authority to issue CWA Section 401(a)(1) certification. Thus, the CDT will issue the CWA Section 401(a)(1) certification for the proposed permit. In the course of issuing this NPDES Permit, EPA had consulted with the CDT.

D. Permit Expiration

The permit will expire five years from the effective date.

IX. References

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

Appendix A: Facility Information

General Information

NPDES ID Number:	ID-002279-9
Physical Address:	1-mile West of City of St. Maries, Idaho
Mailing Address:	602 College Avenue, St. Maries, Idaho 83861
Facility Background:	Primary and secondary treatment in lagoons utilizing land application for 4 months per year, and discharge via outfall for 8 months per year. Facility is located within boundaries of Coeur d'Alene Reservation.

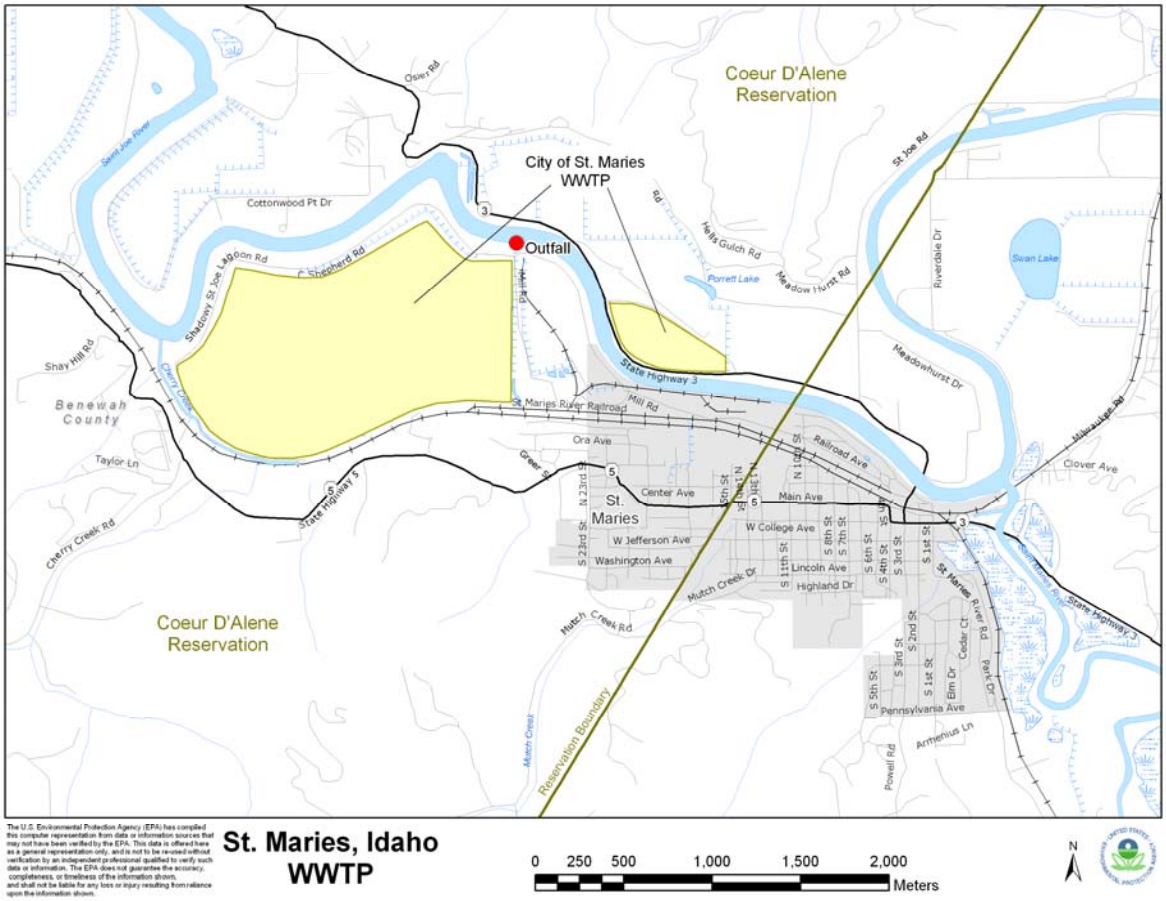
Facility Information

Type of Facility:	Municipal Waste Water Treatment Plant (WWTP)
Treatment Train:	Primary and Secondary Treatment in lagoons
Flow:	2.0 mgd
Outfall Location:	latitude 47° 19' 45.2" N; longitude 116° 35' 30.7" W
Population of City of St. Maries	Approximately 2800 persons: information from the Gazette Record, a community newspaper, at its website: www.stmariesidaho.com, on March 27, 2007

Receiving Water Information

Receiving Water:	St. Joe River. The river is approximately 312 feet wide near the point of discharge.
Watershed:	St. Joe River Watershed
Beneficial Uses:	The IDEQ designated this area of the St. Joe River as having the following uses in IDAPA 58.01.02.110.11 (Unit P-5): For aquatic life - Cold Water Communities; and, for Primary Contact Recreation.

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 also developed and promulgated "treatment equivalent to secondary treatment" effluent limitations, which are found in 40 CFR 133.105. 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 "treatment equivalent to secondary treatment" effluent limits are listed in Table C-2, and the Secondary Treatment effluent limits are listed in Table C-3.

Upon evaluation, the facility does not meet all eligibility criterion for application of the treatment equivalent to secondary treatment found in 40 CFR 133.101(g).

40 CFR 133.101(g) states: *"Facilities eligible for treatment equivalent to secondary treatment.. Treatment works shall be eligible for consideration for effluent limitations described for treatment equivalent to secondary treatment (Section 133.105), if:*

(1) The BOD5 and SS effluent concentrations consistently achievable through proper operation and maintenance (Section 133.101(f)) of the treatment works exceed the minimum level of the effluent quality set forth in Sections 133.102(a) and 133.102(b),

(2) A trickling filter or waste stabilization pond is used as the principal process, and

(3) The treatment works provide significant biological treatment of municipal wastewater."

To be eligible for "treatment equivalent to secondary treatment", the facility must meet all three criterion in 40 CFR 133.101(g). The facility meets condition (2), but it does not meet conditions (1) and (3) of the regulations. The facility therefore is not eligible for consideration of the Treatment Equivalent to Secondary treatment standards since not all conditions are met.

Rationale for not meeting criteria (1) above:

To meet criteria (1), the 95th percentile of the Monthly Averages for BOD_5 and TSS must be greater than 30 mg/l, and the concentration equal to 1.5 times the 95th percentile monthly averages must be greater than 45 mg/l. The facility does not meet this criteria because analysis of all available DMRs on file at EPA indicates that the monthly averages for BOD_5 and TSS at the 95th percentile are 18.42 mg/l and 19.84 mg/l respectively (less than 30 mg/l); and, 1.5 times the 95th percentile of monthly averages are 24.06 mg/l and 31.4 mg/l (less than 45 mg/l). See

Table C-1, below. The facility does not exceed the minimum level of effluent quality set forth in Sections 133.102(a) and 133.102(b), which therefore does not meet criteria (1).

Table C-1: Analysis of DMR Data - City of St. Maries WWTP

BOD5 Mo. Ave	BOD5 Wk Ave	BOD % Removal Mo. Ave.	TSS Mo. Ave	TSS Wk. Ave	Date
12.75	21	73	9.65	14	Jan-98
14.5	17	72	17.5	21	Mar-98
13	21	72	23.8	40	Apr-98
5.75	8	89	6.32	11	May-98
4.75	4.5	91	3.5	4.5	Jun-98
4.25	6	NM*	3.45	5.1	Nov-98
14.7	21	82*	11.85	19	Apr-99
7.5	14	91	4.47	11	May-99
3.4	4	96	2.9	4.6	Jun-99
20.6	24	42	20.2	24	Feb-01
28.4	45	NM*	28.2	35	Mar-01
9.25	19	76	7.5	17	Apr-01
5	19	94*	6.75	21	May-01
9.5	20	91*	6	14	Jun-01
3.5	5	97*	8	12	Nov-01
3.6	4	97	7.6	9	Dec-01
4.25	6	93	8	13	Jan-02
7.5	11	84	11	18	Feb-02
6.75	8	85	17.25	26	Mar-02
2	3	97	1	2	Dec-02
3.25	6	96	2.75	4	Jan-03
4.25	7	92	4.5	8	Feb-03
4	4	89	3.6	6	Mar-03
2.75	4	96	4.3	6	Apr-03
7	7	90	9.5	13	May-03
7	7	91	6	6	Jun-03
2.75	4	97	5.1	7.2	Nov-03
4.49	6.7	94	5.8	7.8	Dec-03
5.6	8.2	93	7.77	10	Jan-04
10.5	15.9	72	13.3	20.3	Feb-04
19.3	17.3	67	19.3	24.2	Mar-04
6.1	11.6	89	11.05	17.8	Apr-04
3.18	4.18	96	5.13	5.2	May-04
7.68	16.7	88	14.25	36.8	Jun-04
14.5	18.6	79	16	25.7	May-05
11.39	9.39	82	5.4	5.8	Jun-05
13.7	19.6	76	5	5	Nov-05
14.9	27.1	78	5	5	Dec-05
10.15	14.8	77	7.4	9	Jan-06
16	24.1	70	15.2	19	Feb-06
15.6	19.9	62	12	14	Mar-06
17.1	23.7	51	8.5	13	Apr-06
10.8	16.5	77	6	9	May-06

BOD5 Mo. Ave	BOD5 Wk Ave	BOD % Removal Mo. Ave.	TSS Mo. Ave	TSS Wk. Ave	Date
11.5	17	63	5.3	6	Jun-06
10.1	17	74	5	5	Nov-06
8.9	10.9	87	5.25	6	Dec-06
12.9	18.4	68	7.75	12	Jan-07
13.8	23.8	75	9.55	13.2	Feb-07
13.6	18.8	56	13.2	19	Mar-07
95th percentile = 18.42 mg/l	95th percentile = 24.06 mg/l	5th percentile = 56.6%	95th percentile = 19.84 mg/l	95th percentile = 31.4 mg/l	
To meet Treatment Equivalent to Secondary Conditions (1) and (3), the data must show:					
>30 mg/l	1.5 times the monthly calculation (18.42 mg/l x 1.5 = 27.63 mg/l) must be greater than 45 mg/l	>65% Removal	>30 mg/l	1.5 times the monthly calculation (19.84 mg/l x 1.5 = 29.76 mg/l) must be greater than 45 mg/l	
Does the Data meet criteria (1) and (3) of Treatment Equivalent to Secondary Treatment:					
No	No	No	No	No	
Note: (*) indicates data has been re-calculated by EPA based on information from the Facility's DMR. (NM) indicates calculation resulted in a negative number which is not meaningful and has been excluded in the 5th Percentile calculation.					

Rationale for meeting condition (2) above: The facility meets the criteria because the facility does utilize waste stabilization ponds as the principle process of treating waste waters.

Rationale for not meeting condition (3) above: This criteria is based on 40 CFR 133.101(k) (i.e., a 30-day average of a minimum of 65% reduction of BOD_5 is consistently attained). The facility does not meet the criteria because the facility has demonstrated by its previously submitted Discharge Monitoring Reports that it could not consistently achieve the 65% percent removal rates for the Federal Equivalent to Secondary treatment limits for BOD5. This is demonstrated that for all available DMRs on file at EPA from January 1998 to March 2007, the 5th percentile of BOD5 removal rates is 56.6%, which is less than the 65% removal rate required by Treatment Equivalent to Secondary standard (see Table C-1, above).

Due to the fact that not all conditions in 40 CFR 133.101(g) are met, the facility is therefore not eligible for the "Treatment equivalent to secondary treatment" standards found in 40 CFR 133.105.

Tables C-2 and C-3 below illustrate the Technology based effluent limits for "Treatment Equivalent to Secondary Treatment", and for the "Secondary Treatment" effluent limits:

Table C-2: Treatment Equivalent to Secondary Treatment Effluent Limits (40 CFR 133.105)			
Parameter	**Average Monthly Limit**	**Average Weekly Limit**	**Range**
BOD_5	45 mg/L	65 mg/L	---
TSS	45 mg/L	65 mg/L	---
Removal Rates for BOD_5 and TSS	65% (minimum)	---	---
pH	---	---	6.0 - 9.0 s.u.

Table C-3: 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.

In developing effluent limits, EPA also considered the Reduced Percent Removal Requirements for Less Concentrated Influent Wastewater:

In accordance with 40 CFR 133.103(d), treatment works that receive less concentrated wastes from separate sewer systems can qualify to have their percent removal limits reduced provided that all of the following conditions are met:

- The facility can consistently meet its permit effluent concentration limits but cannot meet its percent removal limits because of less concentrated influent water;
- The facility would have been required to meet significantly more stringent limitations than would otherwise be required by the concentration-based standards; and,
- The less concentrated influent is not the result of excessive inflow/infiltration (I/I).

The City of St. Maries WWTP does not meet all conditions in 40 CFR 133.103(d) for a treatment works that receive less concentrated wastes. For the first criteria, EPA analyzed the facility's Discharge Monitoring Reports, and concluded that at the 95th percentile of previous records, the facility could meet the Secondary Treatment limits for BOD_5 (95th percentile is 18.42 mg/l for monthly average, 24.06 mg/l for weekly average) and for TSS (95th percentile is 19.84 mg/l for monthly average, and 31.4 mg/l for weekly average), but could not always meet the 85% removal rates of BOD_5 when the 5th percentile is only 56.6% removal (see Table C-1). The facility is able to meet the first criteria as illustrated in Table C-1. The facility is also likely to meet the second criteria because the influent is generally weak which would likely result in more stringent effluent limits if those effluent limits were calculated from influent concentrations as compared to the federal secondary treatment standards. However, the facility has less concentrated influent as a result of excessive I/I; this is discussed below, which illustrates that

the third criteria could not be met for consideration of reduced percent removal requirements for less concentrated wastewater.

The facility's data did not support the eligibility of a reduced percent removal rate for less concentrated influent. In particular, EPA has reviewed the regulations in 40 CFR 133.103(d), and 40 CFR 35.2005(b)(16), and believes that the less concentrated effluent is the result of excessive infiltration and inflow (I/I) partly because the reported maximum flow rates for 2003, 2004, and 2005 are between 8.3 times to 12.2 times the corresponding annual average flow rates per day. In addition, the facility exceeded the 275 gallons per person/day criteria described in 40 CFR 133.103(d) for the population served. Specifically, on its permit application, the facility reported total maximum flow for the years: 2003, 2004, and 2005 at 1,872,000 gallons per day. A calculated volume of 770,000 gallons per day during storm events (derived from 2800 population multiplied by 275 gallons per capita/day) is the upper-limit of what the regulations consider as "nonexcessive" inflow. On its permit application, the facility reported total maximum flow for the years: 2003, 2004, and 2005 at 1,872,000 gallons per day, which is 2.4 times the calculated 770,000 gallons per day criteria, based on its population.

This analysis concludes that the facility does not meet the conditions for eligibility in 40 CFR 133.103(d), "Less concentrated influent wastewater for separate sewers"; therefore, the facility is not eligible for a lower percent removal requirement than those set-forth in 40 CFR 133.102 - Secondary Treatment. Since it has already been established above in this fact sheet that the facility is not eligible for "Treatment equivalent to secondary treatment", the appropriate technology-based effluent limit for consideration in this case is the Secondary Treatment Standards found in 40 CFR 133.102.

Chlorine

Chlorine is often used to disinfect municipal wastewater prior to discharge. The City of St. Maries Waste Water Treatment Plant uses chlorine disinfection. In deriving effluent limits for chlorine, EPA considered standard operating practices, as well as the CDT and State of Idaho Water Quality Standards.

A 0.5 mg/L average monthly limit for chlorine is derived from standard operating practices. The Water Pollution Control Federation's *Chlorination of Wastewater* (1976) states that a properly designed and maintained wastewater treatment plant can achieve adequate disinfection if a 0.5 mg/L chlorine residual is maintained after 15 minutes of contact time. Therefore, a wastewater treatment plant that provides adequate chlorine contact time can meet a 0.5 mg/L total residual chlorine limit on a monthly average basis. In addition to average monthly limits (AMLs), NPDES regulations require effluent limits for POTWs to be expressed as average weekly limits (AWLs) unless impracticable. The AWL is calculated to be 1.5 times the AML, consistent with the "secondary treatment" limits for BOD_5 and TSS. This results in an AWL for chlorine of 0.75 mg/L. These limits are the base line from which EPA then considers appropriate WQS.

When taking WQS into account, EPA evaluates the above standards derived from standard operating practices, and compares them to limits derived from the CDT and State of Idaho WQS. As shown in Appendix F, WQBEL Calculations, the Average Monthly Limit is 0.233 mg/l, and the Maximum Daily Limit is 0.305 mg/l. These WQS are more stringent than the above standard operating practices, and are thus incorporated in the draft permit.

Mass-Based Limits

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 calculated as follows:

Mass based limit (lb/day) = concentration limit (mg/L) × design flow (mgd) × 8.34[1]

For BOD5: Ave. Monthly Limit = 30 mg/l x 2.0 mgd x 8.34 = 500 lbs/day

For BOD5: Ave. Weekly Limit = 45 mg/l x 2.0 mgd x 8.34 = 751 lbs/day

For TSS: Ave. Monthly Limit = 30 mg/l x 2.0 mgd x 8.34 = 500 lbs/day

For TSS: Ave. Weekly Limit = 45 mg/l x 2.0 mgd x 8.34 = 751 lbs/day

For Total Residual Chlorine (Final): Ave. Monthly Limit = 0.233 mg/l x 2.0 mgd x 8.34
= 3.9 lbs/day

For Total Residual Chlorine (Final): Max. Daily Limit = 0.305 mg/l x 2.0 mgd x 8.34
= 5.1 lbs/day

For Total Residual Chlorine (Interim): Average Monthly Limit = 0.5 mg/l x 2.0 mgd x 8.34
= 8.34 lbs/day

For Total Residual Chlorine (Interim): Average Weekly Limit = 0.75 mg/l x 2.0 mgd x 8.34
= 12.51 lbs/day

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) prohibits the issuance of an NPDES permit that does not ensure compliance with the water quality standards 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.

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.

[1] 8.34 is a conversion factor with units (lb ×L)/(mg × gallon×10^6)

In the case of the City of St. Maries Waste Water Treatment Plant, the point of discharge occurs within the boundaries of the Coeur d'Alene Tribe (CDT). The tribe applied to EPA for "Treatment as State" (TAS) for purposes of administering the water quality standards program. EPA approved TAS for the CDT on August 5, 2005. Since the tribe has tribal water quality standards, EPA considered these tribal water quality standards when drafting the proposed permit. Additionally, the EPA approved Idaho Water Quality Standards are also appropriate for the protection of downstream Idaho waters. Therefore, EPA used the more stringent of both these water quality standards when drafting this proposed permit These State of Idaho Water Quality Standards can be found in IDAPA 58, Title 01, Chapter 02 (58.01.02 – Water Quality Standards), and copies of CDT Water Quality Standards can be obtained from the tribe.

For purpose of considering the Idaho WQS, these designations apply: IDAPA 58.01.02 designates the St. Joe River at the point of discharge as The St. Joe Subbasin, HUC 17010304, Unit P-5, St. Joe River from St. Maries River to mouth. The designation for this portion of the St. Joe River is for Aquatic Life as "Cold Water Communities", and for Recreation as "Primary Contact Recreation".

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.

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. Mixing zones must be authorized by the CDT. Based on the previous permit and the draft certification, the water quality-based effluent limits in this permit have been calculated using a mixing zone. If CDT does not grant a mixing zone, the water quality-based effluent limits will be recalculated such that the criteria are met before the effluent is discharged to the receiving water.

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, either because the receiving water already exceeds the criterion, the receiving water flow is too low to provide dilution, or the State does

not authorize one, 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. The following discussion details the specific water quality-based effluent limits in the draft permit.

Once a WLA is developed, EPA calculates effluent limits which are protective of the WLA using statistical procedures described in Appendix F.

C. Facility-Specific Water Quality-based Limits

Hardness-Dependent Metals

In the permit application, the facility identified zinc and copper effluent data at detectible levels. EPA concluded based on Reasonable Potential analyses that both zinc and copper levels do not exceed the WQSs of both CDT and State of Idaho's WQS. Therefore, EPA did not propose effluent limitations for zinc and copper in the draft permit. Dissolved metals is a concern from waste water treatment plants, and hardness is a factor in the site-specific modeling in the next permit cycle at critical conditions, such as at low stream flow and at design flow of the WWTP; therefore, the hardness parameter is included for monitoring in the effluent and in the upstream surface water body.

pH and Alkalinity

The Federal Secondary Treatment Standards indicate that pH range shall be in the range of 6.0 to 9.0. However, the most stringent water quality criterion for pH is for the protection of aquatic life and aquaculture water supply. Pursuant to IDAPA 58.01.02.250.01.a, the Idaho Water Quality Standards General Criteria states that the applicable pH range shall be from 6.5 to 9.0 standard units. The CDT WQS indicate that the applicable pH range shall be from 6.5 to 8.5. EPA believes that a mixing zone for pH is appropriate. Given the chronic dilution ratio of 22.61:1, and a mixing zone, EPA believes that the proposed pH limits of 6.0 to 9.0 from November through June, would be protective to the CDT WQS. For the site specific modeling of pH in the receiving water at critical conditions, such as at low stream flow, and at the design flow of the WWTP, the draft permit requires the analyses of alkalinity and pH in the upstream surface water body and in the effluent.

Dissolved Oxygen

The CDT water quality standards specify that in the protection of aquatic life uses, specifically for Bull Trout, and for Cutthroat Trout, that the dissolved oxygen shall exceed a 7-day average of 9.5 mg/l, and shall exceed 8.0 mg/l at all times. The Idaho water quality standards require surface waters of the state to be free from oxygen-demanding materials in concentrations that would result in an aerobic water condition. IDAPA 58.01.02.250.02.a, Surface Water Quality Criteria for Cold Water, states that the Dissolved Oxygen Concentrations must exceed six (6) mg/l at all times. Taking to account that in both CDT and Idaho WQS, mixing zones can be allowed, and EPA has no effluent data for dissolved oxygen, therefore, EPA proposes no effluent limit for dissolved oxygen at this time, but do propose dissolved oxygen monitoring of the effluent and the receiving water, so that data can be generated for consideration of an effluent limit in the next permit cycle.

Total Phosphorus

The narrative CDT water quality standards is protective of reservation waters for color, odor and taste, nuisance conditions and bottom deposits from nutrients or other substances which originate from anthropogenic causes. Since phosphorus is a nutrient which could impact water quality, and the CDT has expressed concern of excessive nutrients in the St. Joe River, EPA is proposing in the draft permit that the facility monitor total phosphorus levels in the effluent, and perform upstream and downstream surface water monitoring. Data collected from this permit cycle will be evaluated for the next permitting cycle if an effluent limit is warranted.

Orthophosphorus

The Orthophosphorus parameter is proposed by the CDT for effluent sampling in May and June of each year to understand the amount of bio-available phosphorus is being added to the river during the early growing season.

Total Kjeldahl Nitrogen, Nitrate-Nitrite

Total Kjeldahl Nitrogen and Nitrate-Nitrite is proposed for effluent sampling by the CDT in order to analyze the effects of nutrient contribution into the St. Joe River.

E. Coli Bacteria

IDAPA 58.01.02.251.01, Surface Water Quality Criteria for Recreation use Designations, states that waters designed for recreation are not to contain E. coli bacteria, used as indicators of human pathogens, in concentrations exceeding:

Geometric Mean Criterion is applied for this parameter. Waters designated for primary or secondary contact recreation are not to contain E. coli bacteria in concentrations exceeding a geometric mean of 126 E. coli organisms per 100 ml based on a minimum of 5 samples taken every 3 to 7 days over a 30-day period. In addition, for waters designated as primary contact recreation, a single sample maximum of 406 E. coli organisms per 100 ml.

CDT regulates E. coli at 126 organisms per 100ml for a 30-day average period, and a single maximum value of 406 organisms per 100 ml for the recreational and cultural use category.

In consideration of existing applicable regulations, EPA is proposing the protective CDT and Idaho E. coli effluent limitations of 126 organisms per 100 ml as the Average Monthly Limit; and, 406 E. coli organisms per 100 ml as the Instantaneous Maximum Limit. These proposed E. coli effluent limits replaces the effluent limits for fecal coliform in the expired permit.

Oil and Grease

The facility reported in its permit application that oil and grease was not detected in its effluent; therefore, no effluent limit for the “oil and grease” parameter is warranted. However, the facility is required to monitor for oil and grease during the proposed permit cycle as part of Part B.6. “Effluent Testing Data” in the Permit Application. This monitoring requirement is reflected in the effluent monitoring requirements in Table 5, above.

Ammonia

The Coeur d’Alene Tribe and the State of Idaho water quality standards contain criteria for the protection of aquatic life from the toxic effects of ammonia. EPA has applied the more stringent of the applicable CDT and the Idaho ammonia criteria (i.e., CMC and CCC equations) when fish

early life stages are likely absent since NOAA's information indicate that the St. Joe River at the point of discharge is not known to be a migrational corridor for salmonids. The criteria are dependent on pH and temperature; this is 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 C-4 details the equations used to determine water quality criteria for ammonia, and the values of these equations at the 95th percentile pH for all available data for the months from November thru June, from the USGS St. Joe River Calder station, which is 7.81 standard units, and the water temperature observed in the USGS St. Joe River Calder station at the 95th percentile is 14 degrees C. Calculations from formulas in Table C-4 show that the acute criterion is 7.94 mg/l, and the chronic criterion, 3.25 mg/l. These criterions are then considered in reasonable potential calculations which would indicate if effluent limitations for ammonia are warranted.

With only one data point available, reasonable potential calculations required the use of a multiplier of 13.2 in the calculations. These calculations have shown that the discharge would not have the reasonable potential to cause or contribute to a violation of the water quality criteria. Due to these circumstances EPA does not propose an effluent limitation for ammonia. EPA proposes the monitoring of ammonia in the effluent as well as in the receiving water (in the St. Joe River). See Appendices D and F for reasonable potential and effluent limit calculations for ammonia.

Table C-4: Water Quality Criteria for Ammonia

	CDT and IDEQ Acute Criterion	**CDT Chronic Criterion**
Equations:	$\frac{0.275}{1+10^{7.204-\mathrm{pH}}}+\frac{39}{1+10^{\mathrm{pH}-7.204}}$	$\left(\frac{0.0577}{1+10^{7.688-\mathrm{pH}}}+\frac{2.487}{1+10^{\mathrm{pH}-7.688}}\right)\times\left(1.45\times10^{0.028\times(25-MAX(T,7))}\right)$
Results:	7.94 mg/l	3.25 mg/l

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 CDT WQS and the State of Idaho federally approved WQS. 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 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:

$$C_dQ_d = C_eQ_e + C_uQ_u \qquad \text{(Equation D-1)}$$

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 (1Q10, 7Q10 or 30B3)

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

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

The above form of the equation is based on the assumption that the discharge is rapidly and completely mixed with the receiving stream. If the mixing zone is based on less than complete mixing with the receiving water, the equation becomes:

$$C_d = \frac{C_eQ_e + C_u(Q_u \times MZ)}{Q_e + (Q_u \times MZ)} \qquad \text{(Equation D-3)}$$

Where MZ is the fraction of the receiving water flow available for dilution. If a mixing zone is based on complete mixing of the effluent and the receiving water, then MZ is equal to unity (1) and Equation D-3 is equal to Equation D-2.

If a mixing zone is not allowed, and dilution is not available then:

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

Equation D-2 can be simplified by introducing a "dilution factor," noting that the dilution factor is the inverse of the percent effluent concentration at the edge of the acute or chronic mixing zone,

$$D = \frac{Q_e + Q_u}{Q_e} \qquad \text{(Equation D-5)}$$

After the dilution factor simplification, Equation D-3 becomes:

$$C_d = \frac{C_e - C_u}{D} + C_u \qquad \text{(Equation D-6)}$$

If the criterion is expressed as dissolved metal, the effluent concentrations are measured in total recoverable metal and must be converted to dissolved metal as shown in Equation D-7.

$$C_d = \left[\frac{CF \times C_e - C_u}{D}\right] + C_u \qquad \text{(Equation D-7)}$$

Where C_e is expressed as total recoverable metal, C_u and C_d are expressed as dissolved metal, and CF is a conversion factor used to convert between dissolved and total recoverable metal.

Equations D-6 and D-7 are the forms of the mass balance equation which were used to determine reasonable potential and calculate wasteload allocations.

B. Maximum Projected Effluent Concentration

To calculate the maximum projected effluent concentration, 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.

For chlorine, EPA has used the technology-based limit as the maximum projected effluent concentration. The technology-based effluent limit is used in this manner because water quality-based effluent limits are required only when a discharge of the pollutant at the technology-based limit has the reasonable potential to cause or contribute to water quality standards violations. EPA also considered the reasonable potential for the facility to exceed the CDT WQS, and the State of Idaho WQS.

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. For chlorine, there were more than 10 data points, and the calculated CV is 0.19 based on the division of the standard deviation of the data, divided by the mean value.

In Table D-2, EPA computed reasonable potential using a programmed spreadsheet. The results show that data from the facility show that chlorine has the potential to exceed applicable WQSs; and, ammonia, copper and zinc did not show reasonable potential to exceed WQSs. Therefore, based on these circumstances, EPA is requesting an effluent limit for chlorine, and not for ammonia, copper and zinc. Although no effluent limit is developed for ammonia at this time, the proposed permit would require ammonia monitoring so that sufficient data can be generated for analysis in the next permit cycle.

For the discharge period, there are three values for the dilution factor: one based on the 1Q10 flow rate (207 cfs) in the receiving stream and used to determine reasonable potential and wasteload allocations for acute aquatic life criteria, one based on the 7Q10 flow rate (268 cfs) to determine reasonable potential and wasteload allocations chronic aquatic life criteria (except for ammonia) and conventional pollutants, and one based on the 30B3 flow rate (326 cfs) to determine reasonable potential and wasteload allocations for the chronic ammonia criterion. All dilution factors are calculated with the effluent flow rate set equal to the design flow of 2.0 mgd (3.1 cfs). When applied to Equation D-5, and using 25% of flow per Idaho regulations, this results in a total of four different dilution factors under consideration. The dilution factors are listed in Table D-1, below.

Table D-1: Dilution Factors

Period of Dishcharge	Acute Dilution Factor	Chronic Dilution Factor	Chronic Ammonia Criterion Dilution Factor	Acute Ammonia Criterion Dilution Factor
November 1 to June 30	17.69	22.61	27.29	17.69

Calculations:

Note – Pursuant to IDAPA 58.01.02.060(e)(iv), Mixing Zone Policy, the multiplication of 0.25 is included in the calculations because the mixing zone is not to include more than 25% of the volume of the stream flow.

For Acute Dilution Factor and Acute Ammonia Criterion Dilution Factor

= (3.1 + (207x0.25))/3.1 = 17.69;

Chronic Ammonia Dilution Factor = (3.1 + (326x0.25))/3.1 = 27.29;

Chronic Dilution Factor = (3.1 + (268x0.25))/3.1 = 22.61

Table D-2: Reasonable Potential Calculations

	CDT and Idaho Water Quality Standards		Max concentration											
	Acute	Chronic	Acute	Chronic	LIMIT REQUIRED?	Effluent percentile value		Computed Max effluent conc. measured (metals as total recoverable)	Coeff of Variation		# of samples	Reasonable Potential Multiplier	Acute Dilution Factor	Chronic Dilution Factor
Parameter	*ug/L*	*ug/L*	*ug/L*	*ug/L*			*Pn*	*ug/L*	*CV*	*s*	*n*			
Chlorine[1]	19.00	11.00	111.72	87.41	**YES**	0.99	0.858	1560.00	0.19	0.19	30	1.27	18	23
Ammonia[2]	7940	3250	4267.16	2766.07	**NO**	0.99	0.010	5720.00	0.60	0.55	1	13.20	18	27
Copper[3]	13.00	9.00	8.95	7.00	**NO**	0.99	0.010	12.00	0.60	0.55	1	13.20	18	23
Zinc[4]	120	120	10.44	8.17	**NO**	0.99	0.010	14.00	0.60	0.55	1	13.20	18	23
Chlorine[5] (at Chronic Technology Level 0.75mg/l)	19.00	11.00	42.40	33.17	YES	0.99	--	750.00	0.19	0.19		1.00	18	23

Footnotes: Calculations are based on the more stringent standard of the CDT WQS and State of Idaho WQS.
1. Based on both CDT and State of Idaho water quality standards, which are the same for acute and chronic criteria.
2. Based on State of Idaho water quality standards.
3. Based on CDT water quality standards.
4. Based on both CDT and State of Idaho water quality standards, which are the same for acute and chronic criteria.
5. Evaluation of a technology level with the CDT and Idaho water quality standards; shows that the technology level would cause a reasonable potential to exceed CDT and Idaho WQS, thus is concluded that the technology level is inadequate.

Reasonable potential calculations for all pollutants can be found in Table D-2. In Table D-2, EPA also ran a simulation and determined that the technology level for chlorine at 0.75 mg/l would have the reasonable potential to exceed the applicable water quality standards.

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 chlorine as an example.

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

$$p_n = (1 - \text{confidence level})^{1/n} \quad \text{(Equation D-8)}$$

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

For a set of 30 chlorine samples:

$p_n = (1-0.99)^{1/30}$
$p_n = 0.858$

This means that we can say, with 99% confidence, that the maximum reported effluent chlorine concentration is greater than the 85.8th 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:

$RPM = C_{99}/C_p$ (Equation D-9)

Where,
$C = \exp(z\delta - 0.5\delta^2)$ (Equation D-10)

Where,
$\delta^2 = \ln(CV^2 + 1)$ (Equation D-11)
$\delta = \sqrt{\sigma^2}$
CV = coefficient of variation = (standard deviation) ÷ (mean)
z = the inverse of the normal cumulative distribution function at a given percentile

In the case of chlorine:

CV = coefficient of variation = 0.19
$\delta^2 = \ln(CV^2 + 1) = 0.03546$
$\delta = \sqrt{\sigma^2} = 0.188318$
z = 2.326 for the 99th percentile

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

$C_e = (RPM)(MRC)$ (Equation D-12)

where MRC = Maximum Reported Concentration

In the case of chlorine,

$C_e = (1.27)(1560\ \mu g/L) = 1981.2\ \mu g/L$

C. Maximum Projected Receiving Water Concentration

The discharge has reasonable potential to cause or contribute to an exceedance of water quality criteria if the maximum projected concentration of the pollutant at the edge of the mixing zone exceeds the most stringent criterion for that pollutant. The maximum projected receiving water concentration is calculated from Equation D-6:

$$C_d = \frac{C_e - C_u}{D} + C_u \quad \text{(Equation D-6)}$$

Or, if the criterion is expressed as dissolved metal, the maximum projected receiving water concentration is calculated from Equation D-7:

$$C_d = \left[\frac{CF \times C_e - C_u}{D} \right] + C_u \qquad \text{(Equation D-7)}$$

Where C_e is expressed total recoverable metal, C_u and C_d are expressed as dissolved metal, and CF is the conversion factor.

Appendix E: Effluent Limit for pH

The permittee reported in its permit application that data from 6 months of 2005 indicate that the minimum pH is 6.36 s.u., and the maximum pH is 8.40 s.u. (maximum daily values). The following were considered: the chronic dilution factor is 22.61 at discharge; the technology level for Federal Secondary Treatment Standard for pH is in the range of 6.0 s.u. to 9.0 s.u; the State of Idaho WQS indicate a range of 6.5 s.u. to 9.0 s.u.; and, the CDT WQS indicate a range of 6.5 s.u. to 8.5 s.u. Therefore, the appropriate pH range is 6.5 s.u. to 8.5 s.u.

Appendix F: WQBEL Calculations - Aquatic Life Criteria

The following calculations demonstrate how the water quality-based effluent limits (WQBELs) in the draft permit were calculated. The WQBELs for chlorine are intended to protect aquatic life criteria. The following discussion presents the general equations used to calculate the water quality-based effluent limits, then works through the calculations for the November-May copper WQBEL as an example. The calculations for all WQBELs based on aquatic life criteria are summarized in Table F-1.

A. Calculate the Wasteload Allocations (WLAs)

Wasteload allocations (WLAs) are calculated using the same mass balance equations used to calculate the concentration of the pollutant at the edge of the mixing zone in the reasonable potential analysis (Equations D-6 and D-7). 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. Equation D-6 is rearranged to solve for the WLA, becoming:

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

For metals, the Federal regulation at 40 CFR 122.45(c) requires that effluent limits be expressed as total recoverable metal. Therefore, EPA must calculate a wasteload allocation in total recoverable metal that will be protective of the dissolved criterion. This is accomplished by dividing the WLA expressed as dissolved by the criteria translator, as shown in equation F-2. As discussed in Appendix C, the criteria translator (CT) is equal to the conversion factor, because site-specific translators are not available for this discharge. For chlorine, CT=1 for a non-metal, and C_u is the background concentration:

$$C_e = WLA = \frac{D \times (C_d - C_u) + C_u}{CT} \qquad \text{(Equation F-2)}$$

In the case of chlorine, for the acute criterion,

D = 17.69 (from Table D-1); C_d = 19 ug/l (CDT and Idaho WQS); C_u =0 ug/l; CT=1

WLA_a = [17.69 × (19 – 0) + 0]/1
WLA_a = 336 ug/l or 0.336 mg/l

For the chronic criterion,

D = 22.61 (from Table D-1); C_d = 11 ug/l (CDT and Idaho WQS); C_u = 0 ug/l; CT=1

WLA_c = [22.61 × (11 – 0) + 0]/1
WLA_c = 248.71 ug/l or 0.24871 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 EPA's *Technical Support Document for Water Quality-based Toxics Control* (TSD):

$$LTA_a = WLA_a \times \exp(0.5\,\delta^2 - z\,\delta) \qquad \text{(Equation F-3)}$$
$$LTA_c = WLA_c \times \exp(0.5\,\delta_4^2 - z\,\delta_4) \qquad \text{(Equation F-4)}$$

where,

$\delta^2 = \ln(CV^2 + 1)$
$\delta = \sqrt{\sigma^2}$
$\delta_4^2 = \ln(CV^2/4 + 1)$
$\delta = \sqrt{\sigma_4^2}$
z = 2.326 for 99th percentile probability basis

In the case of chlorine, where cv = Standard Deviation/Mean = 0.19:

$\delta^2 = \text{In}(0.19^2+1) = 0.03546$
$\delta = \sqrt{\sigma^2} = 0.1883$
$\delta_4^2 = \text{In}(0.19^2+1) = 0.00898$
$\delta_4 = \sqrt{\sigma_4^2} = 0.0947$
z = 2.326 for 99th percentile probability basis

Therefore,

LTA_a = 0.336 mg/l × exp(0.5 x 0.03546 - 2.326 x 0.1883)
LTA_a = 0.2208 mg/l

LTA_c = 0.24871 mg/l × exp(0.5 x 0.00898 -2.326 x 0.0947)
LTA_c = 0.2004 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 chlorine, the acute LTA of 0.2004 mg/L is more stringent.

B. Derive the maximum daily and average monthly effluent limits

Using the TSD equations, the MDL and AML effluent limits are calculated as follows:

$MDL = LTA \times \exp(z_m \delta - 0.5 \delta^2)$ (Equation F-5)
$AML = LTA \times \exp(z_a \delta_n - 0.5 \delta_n^2)$ (Equation F-6)

where δ, and δ^2 are defined as they are for the LTA equations (F-2 and F-3) and,

$\delta_n^2 = \ln(CV^2/n + 1)$
$\delta = \sqrt{\sigma_n^2}$
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 chlorine,

MDL = 0.336 mg/l x exp (2.326 x 0.1883 – 0.5 x 0.03546)
MDL = 0.3051 mg/l (Max. Monthly Limit)

AML = 0.24871 mg/L × exp(1.645 × 0 .0947 - 0.5 × 0.00898)
AML = 0.2332 mg/L (Ave. Monthly Limit)

Table F-1: Spreadsheet for Calculating Effluent Limits for Total Residual Chlorine

	Acute Dil'n Factor	Chronic Dil'n Factor	Water Quality Standard Acute	Water Quality Standard Chronic	Average Monthly Limit (AML)	Maximum Daily Limit (MDL)
PARAMETER			*ug/L*	*ug/L*	ug/L	ug/L
Chlorine	17.69	22.61	19.00	11.00	**233.2**	**305.1**

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Appendix G: Essential Fish Habitat Assessment

Pursuant to the requirements for Essential Fish Habitat (EFH) assessments, this appendix contains the following information:

- Listing of EFH Species in the Facility Area
- Description of the Facility and Discharge Location
- EPA's Evaluation of Potential Effects to EFH

A. Listing of EFH Species in the Facility Area

On August 23, 2006, Mr. Ed Murrell of the National Oceanic and Atmospheric Administration (NOAA) responded to an EPA request concerning ESA-listed threatened or endangered species in the vicinity of the facility. The NOAA response confirmed that there are no ESA-listed threatened or endangered species under NOAA Fisheries' jurisdiction in the area, and clarified that there is no salmon or steelhead that are listed in the St. Joe River.

B. Description of the Facility and Discharge Location

The activities and sources of wastewater at the City of St. Maries waste water treatment facility are described in detail in Part II and Appendix A of this fact sheet. The location of the outfall is described in Part III ("Receiving Water").

C. EPA's Evaluation of Potential Effects to EFH

Water quality is an important component of aquatic life habitat. NPDES permits are developed to protect water quality in accordance with state water quality standards. The standards protect the beneficial uses of the waterbody, including all life stages of aquatic life. The development of permit limits for an NPDES discharger includes the basic elements of ecological risk analysis. The underlying technical process leading to NPDES permit requirements incorporates the following elements of risk analysis:

Effluent Characterization

Characterization of effluent from the City of St. Maries Waste Water Treatment Plant can be accomplished using a variety of sources, including:

- Permit application monitoring
- Permit compliance monitoring
- Statistical evaluation of effluent variability
- Quality assurance plans and evaluations

Identification of Pollutants of Concern and Threshold Concentrations

The pollutants of concern include pollutants with aquatic life criteria in the Idaho Water Quality Standards. Threshold concentrations are equal to the numeric water quality criteria for the protection of aquatic life. No other pollutants of concern were identified by NMFS.

Exposure and Wasteload Allocation

Analysis of the transport of pollutants near the discharge point with respect to the following:

- Mixing zone policies in the Idaho Water Quality Standards
- Dilution modeling and analysis
- Exposure considerations (e.g., prevention of lethality to passing organisms)
- Consideration of multiple sources and background concentrations

Statistical Evaluation for Permit Limit Development

Calculation of permit limits using statistical procedures addressing the following:

- Effluent variability and non-continuous sampling
- Fate/transport variability
- Duration and frequency thresholds identified in the water quality criteria

Monitoring Programs

Development of monitoring requirements, including:

- Compliance monitoring of the effluent
- Ambient monitoring

Protection of Aquatic Life in NPDES Permitting

EPA's approach to aquatic life protection is outlined in detail in the *Technical Support Document for Water Quality-based Toxics Control* (EPA/505/2-90-001, March 1991). EPA and states evaluate toxicological information from a wide range of species and life stages in establishing water quality criteria for the protection of aquatic life.

The NPDES program evaluates a wide range of chemical constituents (as well as whole effluent toxicity testing results) to identify pollutants of concern with respect to the criteria values. When a facility discharges a pollutant at a level that has a "reasonable potential" to exceed, or to contribute to an exceedance of, the water quality criteria, permit limits are established to prevent exceedances of the criteria in the receiving water (outside any authorized mixing zone).

Effects Determination

The proposed permit has been developed to protect aquatic life species in the St. Joe River in accordance with the Idaho water quality standards. In addition, NOAA has informed EPA by e-mail on August 23, 2006 that there are no endangered or threatened species. Therefore, EPA has determined that issuance of this permit is not likely to adversely affect any EFH in the vicinity of the discharge.