Fact Sheet

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M/S OWW-130
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Seattle, WA 98101-3140

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 Smelterville
Smelterville Wastewater Treatment Plant (WWTP)

The EPA proposes to reissue 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

State Certification
EPA is requesting that the Idaho Department of Environmental Quality (IDEQ) certify the NPDES permit for this facility, under Section 401 of the Clean Water Act. Comments regarding the certification should be directed to:

Idaho Department of Environmental Quality
Coeur d'Alene Regional Office
2110 Ironwood Parkway

Coeur d'Alene, ID 83814
(208) 769-1404 or toll-free at (887) 370-0017

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 the EPA as described in the Public Comments Section of the attached Public Notice.

After the Public Notice expires, and all comments have been considered, the 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://yosemite.epa.gov/r10/WATER.NSF/NPDES+Permits/DraftPermitsID.

U.S. Environmental Protection Agency Region 10
M/S OWW-130
1200 Sixth Avenue
Seattle, Washington 98101-3140
(206) 553-0523 or toll-free at (800) 424-4372

The fact sheet and draft permits are also available at:

U.S. Environmental Protection Agency Region 10
1435 N. Orchard
Boise, ID 83706
(208) 378-5746

U.S. Environmental Protection Agency
Coeur d'Alene Field Office
1910 NW Boulevard
Coeur d'Alene, ID 83814
(208) 664-4588

Idaho Department of Environmental Quality

Coeur d'Alene Regional Office
2110 Ironwood Parkway
Coeur d'Alene, ID 83814
(208) 769-1404 or toll-free at (887) 370-0017

Kellogg Public Library
16 West Market Ave.
Kellogg, ID 83837
(208) 786-7231

Mullan Public Library
117 Hunter Ave.
Mullan, ID 83846
(208) 744-1220

Osburn Public Library
921 East Mullan Ave.
Osburn, ID 83849
(208) 752-9711

Kootenai-Shoshone Area Libraries – Pinehurst Branch
107 Main Ave.
Pinehurst, ID 83850
(208) 682-4579

Wallace Public Library
415 River Street
Wallace, Idaho 83873
(208) 752-4571

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Acronyms

1Q10	The lowest 1-day average flow that occurs on average once every 10 years
7Q10	The lowest 7-day average flow that occurs on average once every 10 years
30B3	Biologically-based design flow intended to ensure an excursion frequency of less than once every three years, for a 30-day average flow.
30Q5	The lowest 30-day average flow that occurs on average once every 5 years
30Q10	The lowest 30-day average flow that occurs on average once every 10 years
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
BMP	Best Management Practices
BPT	Best Practicable
°C	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
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FR	Federal Register
gpd	Gallons per day
HUC	Hydrologic Unit Code
IC	Inhibition Concentration
ICIS	Integrated Compliance Information System
IDEQ	Idaho Department of Environmental Quality
I/I	Infiltration and Inflow
LA	Load Allocation
lbs/day	Pounds per day
LC	Lethal Concentration
LC_{50}	Concentration at which 50% of test organisms die in a specified time period
LD_{50}	Dose at which 50% of test organisms die in a specified time period
LOEC	Lowest Observed Effect Concentration
LTA	Long Term Average
mg/L	Milligrams per liter

ml	milliliters
ML	Minimum Level
µg/L	Micrograms per liter
mgd	Million gallons per day
MDL	Maximum Daily Limit or Method Detection Limit
ML	Minimum Level
MPN	Most Probable Number
N	Nitrogen
NEPA	National Environmental Policy Act
NOAA	National Oceanic and Atmospheric Administration
NOEC	No Observable Effect Concentration
NPDES	National Pollutant Discharge Elimination System
OWW	Office of Water and Watersheds
O&M	Operations and maintenance
POTW	Publicly owned treatment works
PSES	Pretreatment Standards for Existing Sources
PSNS	Pretreatment Standards for New Sources
QAP	Quality assurance plan
RPA	Reasonable Potential Analysis
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
TOC	Total Organic Carbon
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
TU_a	Toxic Units, Acute
TU_c	Toxic Units, Chronic
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
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 Smelterville Smelterville Wastewater Treatment Plant NPDES Permit No. ID0020117	Contact: Dennis Rose, District Manager 208-786-3351
Physical Address: Located off of K Street Smelterville, ID 83868	Mailing Address: P.O. Box 200 Smelterville, ID 83868

Figure 1. Vicinity Map

B. Permit History

The facility's previous permit became effective on August 1, 2004 and expired on August 1, 2009. A complete application for permit reissuance was submitted to the EPA on January 26, 2009. Since the permit was not reissued before the expiration date of August 1, 2009 and the City of Smelterville submitted a timely application, the permit was administratively extended pursuant to 40 CFR § 122.6.

II. Facility Information

A. Treatment Plant Description

The City of Smelterville owns, operates, and maintains the Smelterville wastewater treatment plant (WWTP) located in Smelterville, Idaho in Shoshone County (approximately 40 miles east of the City of Coeur d'Alene). The WWTP provides equivalent to secondary treatment using three lagoons (two of which are aerated) and disinfection using chlorine gas. The Smelterville WWTP treats domestic and commercial sewage from the City of Smelterville (population approximately 651). There are no industrial discharges to the system.

A map showing the location of the Smelterville WWTP and details about the wastewater treatment processes are provided in Appendix A: Process Diagram.

B. Permit Compliance

Compliance with Effluent Limitations

The EPA reviewed the discharge monitoring report (DMR) data for period from August 2004 through July 2011. DMR data for this period is presented in Appendix B: Discharge Monitoring Report Summary and Effluent Data (page 38).

The facility faced numerous compliance issues during the permit cycle and the extended permit period. There were effluent limitation violations for *E. coli*, cadmium, lead, zinc and percent removal for total suspended solids (TSS) and biochemical oxygen demand (BOD_5). The current permit incorporates a variance from the water quality standards for cadmium, lead and zinc. The facility was unable to achieve the water quality-based limits by the end of the permit cycle. The IDEQ issued a new variance that became effective on July 31, 2009 thus the final permit limits were never in effect. For additional information on violations refer to the DMR summary in Appendix B (page 38), violations are highlighted in red.

Receiving Water Testing

The permittee conducted receiving water monitoring as required by the permit. The permittee's receiving water monitoring data is shown in Appendix B. (page 38). This information was used to inform appropriate permit limits in the proposed permit.

Variance Reporting Requirements

The 2004 permit included a variance from the water quality standards and associated effluent limits for cadmium, lead and zinc. The permit also included specific Variance Requirements to demonstrate progress toward meeting the much lower water quality-based effluent limits. The permittee submitted annual reports and completed other milestones as required.

Best Management Practices (BMPs)

The permittee was required to incorporate specific BMPs into the Operations and Maintenance Plan by February 2009. The permittee should continue to identify and address BMPs to enhance and ensure compliance with effluent limitations.

Facility Planning

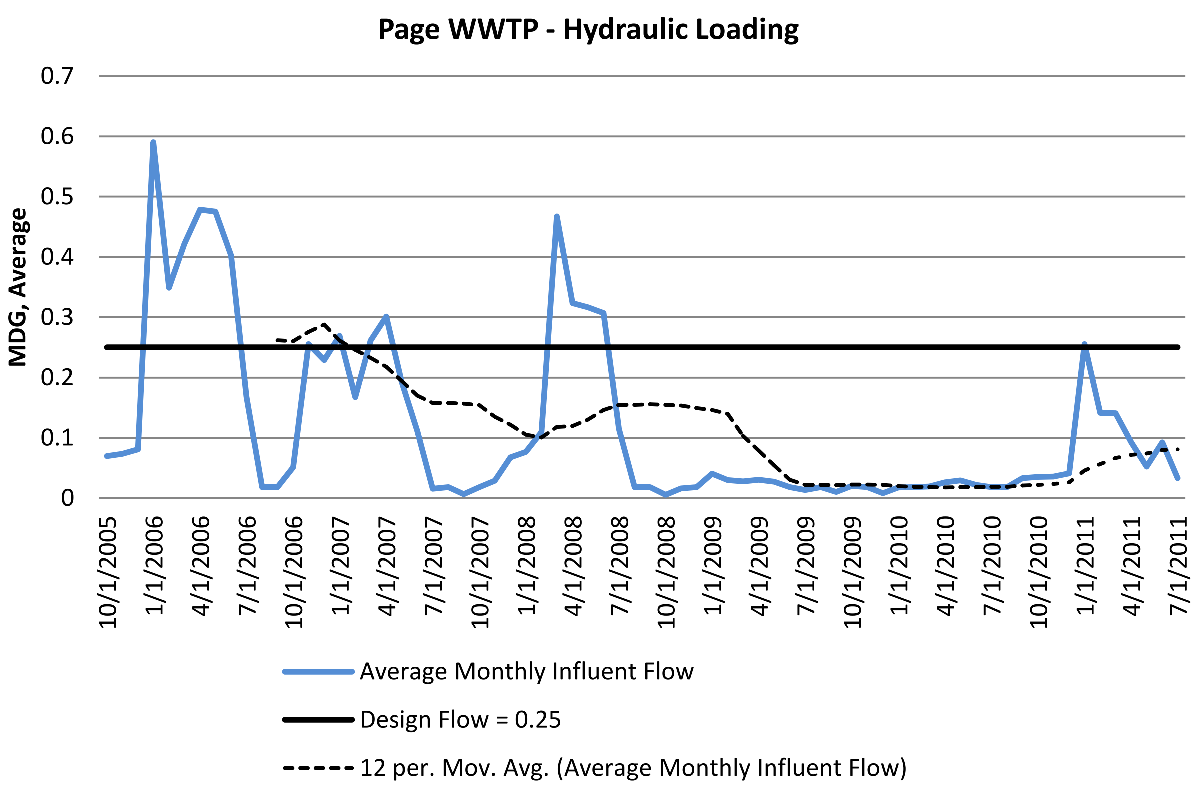
The permittee was required to begin facility planning when influent hydraulic loading exceeded 85% of the design criteria on an average annual basis based on the previous twelve months of data. The planning and schedule for improvements was to begin within one year of first exceeding 85% of any of the design criteria. The design capacity is as follows.

Table 1. Design Capacity 2004 Permit

Criteria	Value	85% of Design	Units
Average Flow	0.25	0.21	mgd

Extensive replacement of the collection system reduced the overall flow into the WWTP since 2008 as shown in the figure below. Presently, the WWTP receives flows well below its design capacity.

Figure 2. Average Annual Hydraulic Loading



III. Receiving Water

The facility discharges to the South Fork Coeur d'Alene River near the City of Smelterville. The facility has done receiving water monitoring throughout the permit cycle as required by the permit, as summarized in Appendix B. Appendix C (page 51) summarizes receiving water monitoring data from the U.S. Geological Survey (USGS). Available information about the flow and quality of the receiving water was used to establish appropriate permit limits for the discharge.

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.

The EPA uses 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 (30B3) to evaluate ammonia. This evaluation criterion aligns with the ammonia criteria being based on the 30-day average concentration not to be exceeded more than once every three years. The lowest 30-day average flow rate expected to occur once every ten years (30Q10) may be used for ammonia in cases where seasonal variation in flow is used. The Idaho WQS recommend the lowest 30-day average flow rate expected to occur once every five years (30Q5) flow rate for the human health criteria for non-carcinogens, and the harmonic mean flow rate for the human health criteria for carcinogens.

River flow data from the following two U.S. Geological Survey (USGS) monitoring stations were considered to evaluate critical flows. Figure 3 shows the locations of the monitoring stations in reference to the WWTP and Table 2 shows the critical design flows used as the basis for this permit.

The EPA determined critical design flows near the discharge considering stream flow data from the following U.S. Geological Survey (USGS) monitoring locations:

1. Upstream Site NR KELLOGG ID — USGS 12413210 SF COEUR D ALENE AT ELIZABETH PARK Latitude 47° 31'53", Longitude 116° 05'33"
2. Upstream Site SMELTERVILLE ID — USGS 12413300 SF COEUR D ALENE RIVER AT Latitude 47°32'54", Longitude 116°10'31"
3. Downstream Site: ID — USGS 12413470 SF COEUR D ALENE RIVER NR PINEHURST Latitude 47°33'07", Longitude 116°14'11"

Figure 3. River Flow Monitoring Stations in the Vicinity of the Outfall

Data from the upstream Smelterville monitoring site was used as the basis for critical flow data for the 2004 permit (identified as 2 in figure above). Monitoring data for this location spans seven years, from 1966 through 1974. According to the previous fact sheet, the 1Q10 and 7Q10 were set as the lowest flow observed during the time period. The lowest flow during the period was 64 cfs which occurred December 8, 1972. This flow was used for both the 1Q10 and 7Q10 flows as the basis for evaluating reasonable potential and for establishing permit limits. For the proposed permit, the flow data at Smelterville was not considered further because the data is relatively old and the duration too short to establishing critical flows.

River flow data from both Pinehurst and Elizabeth Park were evaluated to establish critical rivers flows for the proposed permit. Limited instantaneous river flow data collected between January 8, 2002 and October 16, 2008 at Smelterville was used to establish a correlation between flows at both the Elizabeth Park and the Pinehurst USGS monitoring stations. Flows at Smelterville were more highly correlated with flows at Elizabeth Park than with Pinehurst. Therefore, the Elizabeth Park gauge data was used to establish critical river flows near the point of discharge.

The Elizabeth Park monitoring location includes daily flow data beginning in 1987 through the present. The following graph shows the average monthly flows during the period from 1987 through 2011. The low flow period for establishing effluent limitations is July through December and the high flow period is January through June, refer to Appendix C (page 44), figure 7.

The critical design flows at Elizabeth Park were calculated using the EPA's dFlow[1] program for flows at Elizabeth Park using approximately 24 years of daily flow data.

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[1] Water Quality Models and Tools – DFLOW (http://water.epa.gov/scitech/datait/models/dflow/index.cfm)

Table 2. Critical Design Flows – South Fork Coeur d'Alene River at Elizabeth Park

Critical Flow Parameter	Annual Basis	High Flow (January-June)	Low Flow (July-December)
1Q10	40.4	**46.8**	**42.2**
7Q10	51	**58.8**	**52.4**
30Q10	57.1	**71.9**	**56.6**
30Q5	59.3	**91.4**	**61.1**
Harmonic Mean	143	**143**	**141**

A correlation between the daily river flow data at Elizabeth Park and the limited instantaneous flow data at the Smelterville gauge was established using the Excel® workbook based on an established statistical method, refer to Appendix C: River Critical Design Flows.[2] The Smelterville river flow data is presented in Appendix C. The correlation was used to estimate the critical river flows in the vicinity of the discharge (Table 3).

Table 3. Critical Design Flows – SF Coeur d'Alene River Estimate at Smelterville

Critical Flow Parameter	Annual Basis	High Flow (January-June)	Low Flow (July-December)
1Q10	41.5	**48.2**	**43.3**
7Q10	52.6	**60.8**	**54.0**
30Q10	59.0	**74.6**	**58.4**
30Q5	61.3	**95.2**	**63.2**
Harmonic Mean	150.2	**150.2**	**148.1**

B. Water Quality Standards

Overview

Section 301(b)(1)(C) of the CWA requires the development of limitations in permits necessary to meet water quality standards. 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, narrative and numeric water quality criteria, and an anti-degradation policy. The use classification system designates the beneficial uses that each water body is expected to achieve, such as drinking water supply, contact recreation, and aquatic life. The narrative and numeric water quality criteria are the criteria deemed necessary by the state to support

[2] Hirsch, R. A Comparison of Four Stream flow Record Extension Techniques. Water Resources Research. Vol. 18, No. 4, Pages 1081-1088. August 1982.

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.

Designated Beneficial Uses

This facility discharges to the South Fork Coeur d'Alene River in the South Fork Coeur d'Alene River subbasin (USGS HUC 17010302). At the point of discharge, the South Fork Coeur d'Alene River is protected for the following designated uses as specified in IDAPA 58.01.02.150.10:

- COLD - Cold Water Communities
- SCR – Secondary Contact Recreation

In addition, the Idaho WQS state that all waters of the state of Idaho are protected for industrial and agricultural water supply (Section 100.03.b and c.), wildlife habitats (100.04) and aesthetics (100.05). The WQS state in Sections 252.02, 252.03 and 253 that these uses are to be protected by general criteria (sometimes referred to as narrative) which are stated in Section 200. The WQS also state, in Section 252.02 that the criteria from Water Quality Criteria 1972, also referred to as the "Blue Book" (EPA-R3-73-033) can be used to determine numeric criteria for the protection of the agricultural water supply use.

Surface Water Quality Criteria

The WQS establish both general and numeric surface water quality criteria which apply to all surface waters.

The general criteria (IDAPA 58.01.02.200) state that all surface waters of the state shall be free from:

- hazardous materials,
- toxic substances,
- deleterious materials,
- radioactive materials,
- floating, suspended or submerged matter,
- excess nutrients,
- oxygen-demanding materials

Surface water level shall not exceed allowable level for:

- radioactive materials, or
- sediments

If the natural background conditions exceed any criteria then the applicable criteria does not apply, but rather, there shall be no lowering of water quality from the natural background condition.

The WQS establish numeric criteria (IDAPA 58.01.02.210) that apply to waters designated for aquatic life, recreation and domestic water supply. The numeric criteria establish the maximum concentration of a pollutant that can be present surface waters.

The WQS establish additional surface water criteria to protect aquatic life uses (IDAPA 58.01.02.250). These include pH and total concentration of dissolved gasses which apply to all aquatic life designations and dissolved oxygen, temperature. ammonia, and turbidity which have unique criteria depending on the beneficial use designations of cold water, salmonid spawning, seasonal cold water or warm water.

The WQS establish surface water quality criteria for recreational use designation (IDAPA 58.01.02.251). Waters designated for recreation are not to contain *E. coli* bacteria in concentrations that exceed the established criterion as prescribed for secondary contact recreation. The following table summarized the applicable water quality criteria and outline how the permit ensures that the permitted discharge will not cause or contribute to non-attainment of the applicable criteria in the water body.

Table 4. Summary of Applicable Water Quality Criteria

Criteria for Water body	How the Criteria was evaluated…
General Criteria (IDAPA 58.01.02.200) Surface waters of the state shall be free from: • hazardous materials, • toxic substances, • deleterious materials, • radioactive materials, • floating, suspended or submerged matter, • excess nutrients, • oxygen-demanding materials Surface water level shall not exceed allowable level for: • radioactive materials, or • sediments	The treatment process utilizes secondary (biological) treatment using lagoons. This level of treatment ensures that the effluent will not contribute to violations of the general criteria. Sewer ordinances prohibit the discharge of many of these pollutants into the sanitary sewer system.

Criteria for Water body	How the Criteria was evaluated…
Numeric Criteria for Toxics (IDAPA 58.01.02.210) The WQS contain a listing of pollutants for which numeric criteria have been established. Extensive monitoring of the effluent throughout the permit cycle has shown that the following toxic pollutants present at detectable levels in the effluent. • Ammonia • Cadmium • Chlorine (Total Residual) • Copper • Lead • Zinc	Refer to Appendix D for the numeric criteria used to evaluate the reasonable potential for the effluent to cause or contribute violation of the WQS for both low and high river flow conditions. The reasonable potential analysis shows that ammonia, chlorine, cadmium, lead and zinc have a reasonable potential to contribute to violations of the aquatic life criteria. Effluent limitations are required and were calculated for these parameters. A seasonal effluent limit was established for ammonia during the low flow period based on 50% of critical river flows based on the adjacent mixing zone with the Page WWTP.. There is no reasonable potential during the high flow period, therefore, no limit during the high flow period. Seasonal water quality-based limits were calculated for total residual chlorine based on authorization of 50% of critical river flows based on the adjacent mixing zone with the Page WWTP. However, the low flow limits were imposed year around to simplify the permit adminstration. The limits for the high flow and low flow permits were nearly the same. The metals criteria are a function of hardness, which vary for for low and high river flow conditions and the mixture of the effluent and receiving water. Per Idaho's Water Quality Standards at IDAPA 58.01.02.210.03.c.ii: "The hardness values used for calculating aquatic life criteria for metals at design discharge conditions shall be representative of the ambient hardnesses for a receiving water that occur at the design discharge conditions given in Subsection 210.03.b." The reference to 210.03.b provides the 1Q10/1B3 and 7Q10/4B3 design conditions for aquatic life criteria. Variance-based, interim and final WQBELs where established for cadmium, lead and zinc. There limits were calculated assuming that no mixing zone would be authorized because the receiving water exceeds the criteria for these pollutants. Refer to Appendix D for the evaluation of the reasonable potential for the effluent to cause or contribute to violation of the WQS for critical river flow conditions.

Criteria for Water body	How the Criteria was evaluated…
Surface Water Criteria To Protect Aquatic Life Uses (IDAPA 58.01.02.250) pH – Range 6.5-9.0 Total Dissolved Gas – <110% saturation at atm. pressure. **Cold Water** Dissolved Oxygen – 6 mg/L Temperature – Cold Water, 22ºC instantaneous max. 19ºC max daily average. Ammonia – refer to appendix C, temperature and pH dependent Turbidity – 50 NTU, but no more than 25 NTU for more than 10 days.	pH – The permit includes end-of-pipe effluent limits for pH based on the potential of the effluent to contribute to violations of the criteria. Appendix D includes an analysis that considers worst case effluent and receiving water conditions to determine if there is a reasonable potential for the discharge to contribute to violations of the WQS. The technology-based limits of pH 6.0 to 9.0 may contribute to violations at the low end of the range. This analysis shows that there is no reasonable potential for the discharge to contribute to violations of the WQS if effluent pH is limited to a range of 6.5 to 9.0 s.u. Total Dissolved Gas – The effluent is not expected to contain dissolved gases. No further evaluation was done. Dissolved Oxygen - Based on the ratio of mixing of the effluent in the receiving water, the effluent does not have a reasonable potential to contribute to violations of the WQS for dissolved oxygen. The Streeter-Phelps equation was used to evaluate DO. The DO is not predicted to drop below the water quality criteria based on limited available input data. Temperature – The effect of the effluent on the receiving water temperature was evaluated in very general terms in appendix D. The data set lacked daily temperature data needed to make a determination of reasonable potential. Additional monitoring for temperature in the receiving water and effluent is required to better characterize the seasonal variation of the effluent and receiving water temperature. This information is needed to better evaluate during which periods of the year the effluent may contribute to violations of the WQS. Ammonia – There is a reasonable potential to contribute to excusions of the WQS for ammonia. Seasonal water quality-based effluent limits were established to ensure that the effluent does not contribute to violations of the ammonia criteria. Turbidity – No turbidity data was collected for the effluent. The technology-based limit for TSS of 30 mg/L is presumed to be protective. Refer to Appendix D for the evaluation of the reasonable potential for the effluent to cause or contribute to violation of the WQS for critical river flow conditions.

Criteria for Water body	How the Criteria was evaluated…
Surface Water Quality Criteria For Recreational Use Designation (IDAPA 58.01.02.251) **Secondary Recreation** E. Coli – 126 organisms per 100 ml on a minimum of 5 samples taken every 3 to 7 days in a 30 day period. 576 organisms per 100 ml a single sample maximum is not alone a violation but indicates a likely exceedance of the geometric mean criterion..	The permit applies end-of-pipe limitations for *E. coli*, therefore, the discharge will not contribute to non-attainment of the criteria.

Water Quality Impairments in the Receiving Water

The IDEQ has identified the following water quality impairments.

Table 5. Causes of Impairment for Reporting Year 2010

Cause of Impairment	Cause of Impairment Group	State TMDL Development Status
Cadmium	Metals (other than Mercury)	TMDL needed
Lead	Metals (other than Mercury)	TMDL needed
Sedimentation/Siltation	Sediment	TMDL completed
Zinc	Metals (other than Mercury)	TMDL needed
Temperature		TMDL needed

IDEQ completed the *South Fork Coeur d'Alene River Sediment Subbasin Assessment and Total Maximum Daily Load* in May 2002[3]. The EPA approved the TMDL in August 2003. The TMDL assigned a wasteload allocation of 24.6 tons per year (equivalent to 134.8 lbs/day) of total suspended solids (TSS) for discharged from the Smelterville WWTP. Refer to Appendix D, Section G (page 73) for development of effluent limitations based on the TMDL allocation. The TMDL-based limit is less stringent that the technology-based limit therefore the technology-based limit is used in the proposed permit.

Variance to Water Quality Standards

The IDEQ issued a document titled *Variance from Idaho Water Quality Aquatic Life Criteria for Cadmium, Lead and Zinc*[4] on June 5, 2009. The EPA approved the variance on June 30, 2009. The variance became effective on July 30, 2009 and expires on July 30, 2014. The variance established the applicable permit limits for cadmium, lead and zinc while the variance is in effect. The following table shows the permit limits established under the variance.

[3] http://www.deq.idaho.gov/water-quality/surface-water/tmdls/table-of-sbas-tmdls/coeur-d'alene-river-south-fork-subbasin.aspx
[4] http://www.deq.idaho.gov/water-quality/surface-water/standards/variances.aspx

Table 6. Variance-based Limits for Cadmium, Lead and Zinc

Parameter	Maximum Daily Limitation		Average Monthly Limitation	
	µg/L	Lbs/day	µg/L	Lbs/day
Cadmium, Total Recoverable	29.8	0.30[1]	17.5	0.19[1]
Lead, Total Recoverable	85	0.18	46	0.096
Zinc, Total Recoverable	3,490	7.0	1,994	4.0

1 As indentified in the approval variance. Permit limit was calculated based on design flow.

The draft permit includes WQ-based effluent limits for cadmium, lead and zinc. The permittee will have to make significant modifications to the WWTP at significant cost to meet the WQ-based effluent limitations. Therefore, the proposed permit includes a compliance schedule to allow time to make the necessary upgrades. If the IDEQ chooses to extend or re-issue a variance beyond the July 30, 2014 deadline, the permit would need to be modified in order to incorporate the re-issued variance.

Site Specific Criteria

Site-specific water quality criteria (SSC) that reflect local environmental conditions are allowed by federal and state regulations. 40 CFR § 131.11 provides states with the opportunity to adopt water quality criteria that are "…modified to reflect site specific conditions."[5] SSC were adopted for cadmium, lead and zinc by IDEQ in the Water Quality Standards and approved by the EPA. The following equations were used to calculate the numeric criteria for these pollutants, refer to Appendix D (page 55).

Table 7. Site Specific Criteria Equations for Cadmium, Lead and Zinc

Parameter	CMC (µg/L)	CCC (µg/L)
Cadmium	exp[1.0166 x ln(hardness)-3.924]	[1.101672-(ln(hardness) x 0.041838] x exp[(0.7852*LN(hardness)-3.49]
Lead	exp[0.9402 x ln(hardness)+1.1834]	exp[0.9402 x ln(hardness)-0.9875]
Zinc	exp[0.6624 x ln(hardness)+2.2235]	exp[0.6624 x ln(hardness)+2.2235]

Antidegradation

The EPA is required under Section 301(b)(1)(C) of the Clean Water Act (CWA) and implementing regulations 40 CFR §§ 122.4(d) and 122.44(d) to establish conditions in NPDES permits that ensure compliance with State water quality standards, including antidegradation requirements.

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5 Development of Site-Specific Water Quality Criteria for the South Fork Coeur d'Alene River, Idaho, Application Of Site-Specific Water Quality Criteria Developed In Headwater Reaches To Downstream Waters. Idaho Department of Environmental Quality, December 13, 2002, (http://www.deq.idaho.gov/media/445306-sfcda_criteria_downstream.pdf)

The IDEQ integrates antidegradation review into the 401 certification process. The IDEQ provided the EPA with an antidegradation analysis as part of their draft 401 certification for the draft permit, refer to Appendix H.

IV. Effluent Limitations

A. Basis for Effluent Limitations

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 water body are being met and may be more stringent than technology-based effluent limits. The technical basis for the effluent limitations established for the permit are discussed in Appendix D: Basis for Effluent Limits.

B. Proposed Effluent Limitations

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

1. The permittee must not discharge floating, suspended, or submerged matter of any kind in amounts causing nuisance or objectionable conditions or that may impair designated beneficial uses of the receiving water.
2. Removal requirements for biochemical oxygen demand (BOD_5) and total suspended solids (TSS): The monthly average effluent concentration must not exceed 35 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 concentrations and the arithmetic mean of the effluent concentrations for that month. Influent and effluent samples must be taken over approximately the same time period as a flow-proportional 24-hour composite sample.

The table below presents the proposed average monthly, average weekly, maximum daily, minimum daily and other effluent limits that apply. Refer to Appendix D for the derivation for effluent limits.

Table 8. Basis for Proposed Effluent Limits

Parameter	Effluent Limitations				Basis for Limit
	Units	Average Monthly	Average Weekly	Maximum Daily[2]	
Numeric Effluent Limits					
Biochemical Oxygen Demand (BOD_5)	mg/L	**45**	**65**	—	Both the concentration and mass limits are technology-based. Percent removal is technology-based for treatment equivalent to secondary.
	lb/day	**94**	**136**	—	
	% removal	**65% min.**	—	—	

Parameter	Effluent Limitations				Basis for Limit
	Units	Average Monthly	Average Weekly	Maximum Daily[2]	
Total Suspended Solids (TSS) *TMDL-based limit*	mg/L	**45**	**65**	**—**	Both the concentration and mass limits are technology-based. The average weekly limit is 1.5 times the monthly average limit. The concentration limits are technology-based.
	lb/day	**94**	**136**	**—**	
	% removal	**65% min.**	**—**	**—**	
E. coli Bacteria[1]	#/100 ml	**126** **(geometric mean)**	**—**	**576** **(instantaneous max.)**	Water-quality based, no mixing zone authorized.
pH	s.u.	**Daily minimum 6.5** **Daily maximum 9.0**			Water-quality based, no mixing zone authorized.
Total Residual Chlorine Interim Limit Through 12/31/2014	µg/L	**410**	**—**	**560**	The interim limit is intended to provide time to install a system for the dechlorination of the effluent. The interim limits are the same as the limits in the current permit.
	lb/day	**0.85**	**—**	**1.2**	
Total Residual Chlorine[2] Final Limit Effective 1/1/2015	µg/L	**29**	**—**	**73**	Water-quality based limit with mixing zone authorized at 50% based on the shared mixing zone. The limits for the low flow condition will apply year around since seasonal limits are nearly the same, refer to appendix D.
	lb/day	**0.06**	**—**	**0.15**	
Total Ammonia (as N) *High Flow Period (January - June)*	mg/L	**—**	**—**	**—**	There is no reasonable potential to contribute to violations of the WQ criteria for ammonia during the high flow period. Monitoring is required.
	lb/day	**—**	**—**	**—**	
Total Ammonia (as N) *Low Flow Period (July - December)*	mg/L	**26.8**		**70.1**	There is a reasonable potential to contribute to violations of the WQ criteria for ammonia during the low flow period. A limit was established based on the authorization of a mixing zone (50% based on shared mixing zone with the Page WWTP) and resulting dilution at critical river flows, refer to Appendix D.
	lb/day	**56**		**146**	
Numeric Effluent Limits under Variance - Effective until midnight July 30, 2014					
Cadmium	µg/L	**17.5**	**—**	**29.8**	Limit was established by a variance issued by IDEQ and approved by EPA. Note: mass loading as calculated based on concentration and design flow.
	lb/day	**0.036**	**—**	**0.062**	

Parameter	Effluent Limitations				Basis for Limit
	Units	Average Monthly	Average Weekly	Maximum Daily[2]	
Lead	µg/L	**46**	—	**85**	Limit was established by a variance issued by IDEQ and approved by EPA.
	lb/day	**0.96**	—	**0.18**	
Zinc	µg/L	**1,994**	—	**3,490**	Limit was established by a variance issued by IDEQ and approved by EPA.
	lb/day	**4.0**	—	**7.0**	
Interim Numeric Effluent Limits under Compliance Schedule Effective July 31, 2014 through December 31, 2034					
Cadmium	µg/L	**13.5**	—	**21.9**	The interim limits were calculated using the same methodology to calculate the 2004 and 2009 variances. The full data set from 2004-2011 was used to calculate the interim limits, refer to page 74. Mass limits were based on design flow. Refer to Appendix D.
	lb/day	**0.028**	—	**0.046**	
Lead	µg/L	**42**	—	**64**	
	lb/day	**0.013**	—	**0.088**	
Zinc	µg/L	**1,290**	—	**2,220**	
	lb/day	**2.7**	—	**4.6**	
Final Numeric Effluent Limits – Water Quality-Based – Effective as noted below					
Cadmium *Effective* ***January 1, 2035***	µg/L	**0.72**	—	**1.7**	Water-quality based, assumes no mixing zone authorized, metals criteria based receiving water hardness at critical flows. Refer to Appendix D for the limits calculations.
	lb/day	**0.0015**	—	**0.0035**	
Lead *Effective* ***January 1, 2035***	µg/L	**18**	—	**39**	
	lb/day	**0.038**	—	**0.081**	
Zinc *Effective* ***January 1, 2035***	µg/L	**98**	—	**168**	
	lb/day	**0.20**	—	**0.35**	

Footnotes reference sections in the permit.

1. The average monthly *E. coli* bacteria counts must not exceed a geometric mean of 126/100 ml. See Part VI for a definition of geometric mean.
2. Reporting is required within 24 hours of a maximum daily limit or instantaneous maximum limit violation. See I.B.2. and III.G.

   The limits for total residual chlorine are not quantifiable using EPA approved analytical methods. The Minimum Level (ML) for chlorine is 50 µg/L. When the daily maximum and average monthly effluent concentration is below the ML, EPA will consider the permittee in compliance with the total residual chlorine limitations.
3. The monthly average percent removal must be calculated from the arithmetic mean of the influent concentration values and the arithmetic mean of the effluent concentration values for that month. Influent and effluent samples must be taken over approximately the same time period.

C. Basis for Less Stringent Effluent Limits (Anti-backsliding)

Clean Water Act Section 402(o)(3) Requirements

Section 402(o) of the CWA generally prohibits the establishment of effluent limits in a reissued NPDES permit that are less stringent than the corresponding limits in the previous permit (i.e. "backsliding") but provides limited exceptions. Section 402(o)(1) of the CWA states that a permit may not be reissued with less-stringent limits established based on Sections 301(b)(1)(C), 303(d) or 303(e) (i.e. water quality-based limits or limits established in accordance with State treatment standards) except in compliance with Section 303(d)(4). Section 402(o)(1) also prohibits backsliding on technology-based effluent limits established using best professional judgment (i.e. based on Section 402(a)(1)(B)).

Section 402(o) of the Clean Water Act and federal regulations at 40 CFR §122.44 (l) prohibit the renewal, reissuance or modification of an existing NPDES permit that contains effluent limits, permit conditions or standards that are less stringent than those established in the previous permit (*i.e.,* anti-backsliding). The Clean Water Act at Section 402(o)(2) sets forth some exceptions to the prohibition against backsliding from effluent limitations provided the revised effluent limitation does not result in a violation of applicable water quality standards, including antidegradation requirements.

The proposed permit does not contain any limits that are higher than any effective permit limits. Final WQBELs for cadmium, lead and zinc were never put into effect because of ongoing variances from meeting the WQBELs. The following discussion provides explanation of the changed limits in the proposed permit.

Cadmium, Lead and Zinc Limits – less stringent

The water quality-based permit limits for cadmium, lead, and zinc slightly increased in the proposed permit. The methodology for calculating the water quality-based limits for cadmium, lead and zinc was changed from the current permit to be consistent with the TSD. (Section 5.5.3 of the TSD, recommends to use an assumed number of samples "n" of at least four to derive the AML even when the compliance monitoring frequency is less than four samples per month when the chronic long term average is used to calculate limits.). In addition, receiving water hardness was used to calculate the appropriate site specific criteria. The hardness was based on additional analytical data collected under the 2004 permit, refer to Appendix D (page 57). The following table provides a comparison the WQBELs for metals.

Table 9. Comparison of WQ-based Limits for Chlorine, Cadmium, Lead and Zinc

Parameter	Effluent Limitations				
	Units	Average Monthly	Maximum Daily	Average Monthly	Maximum Daily
		Proposed Permit		Current Permit	
Cadmium	μg/L	**0.72**	**1.7**	0.39	0.53
	lb/day	**0.0015**	**0.0035**	0.001	0.001
Lead	μg/L	**18**	**39**	7.7	15
	lb/day	**0.038**	**0.081**	0.02	0.03
Zinc	μg/L	**98**	**168**	60	82
	lb/day	**0.20**	**0.35**	0.12	0.17

The final permit limits for cadmium, lead and zinc in the current permit were not put into effect because the two consective variances for cadmium, lead and zinc. Therefore, the proposed less stringent limits are not subject to anti-backsliding.

Ammonia and Chlorine Limits – limits are more stringent than current permit

Water quality-based limits that utilize a mixing zone are much more stringent than those in the current permit because the proposed permit limits are based on overlapping mixing zones for Page and Smelterville WWTPs. The Smelterville WWTP discharges approximately 10 feet upstream of the Page WWTP. The combined discharges must meet the water quality standards at the edge of the mixing zone. The combined load reduction is 197 lbs/day on a monthly average basis as discuss in Appendix D (page 72).

The chlorine concentration limits are the same for both the Page and Smelterville WWTPs. The chlorine mass based limits for each facility are based on the design flow of each of the facilities.

The combined ammonia load for the two facilities can be apportioned based on the design flow of each facility or some other combination such that the sum of the mass load limitations is not exceeded and the combined discharge meets the water quality standard at the edge of the mixing zone. In the proposed permit, the Smelterville WWTP has been allotted approximately 5% additional load above what would be allotted based on their design flow alone. Consequently, the Page WWTP has been allocated less ammonia loading than could be allocated based on their design flow. This allotment allows both facilities to have effluent limits achievable with their current WWTPs technology. Refer the discussion and calculations in Appendix D (page 72).

Table 10. Comparison of WQ-based Limits from Current Permit

Parameter	Effluent Limitations				
	Units	Average Monthly	Maximum Daily	Average Monthly	Maximum Daily
		Proposed Permit		Current Permit	
Total Ammonia as N	mg/L	**26.8**	**70.1**	136	525
	lb/day	**56**	**146**	284	1,095
Chlorine	µg/L	**29**	**73**	410	560
	lb/day	**0.06**	**0.15**	0.85	1.2

V. Compliance Schedule

A. Legal Basis

The Idaho Water Quality Standards at IDAPA 58.01.02.400.03 allows for compliance schedules “which allow a discharger to phase in, over time, compliance with water quality based effluent limitations when new limitations are in the permit for the first time”.

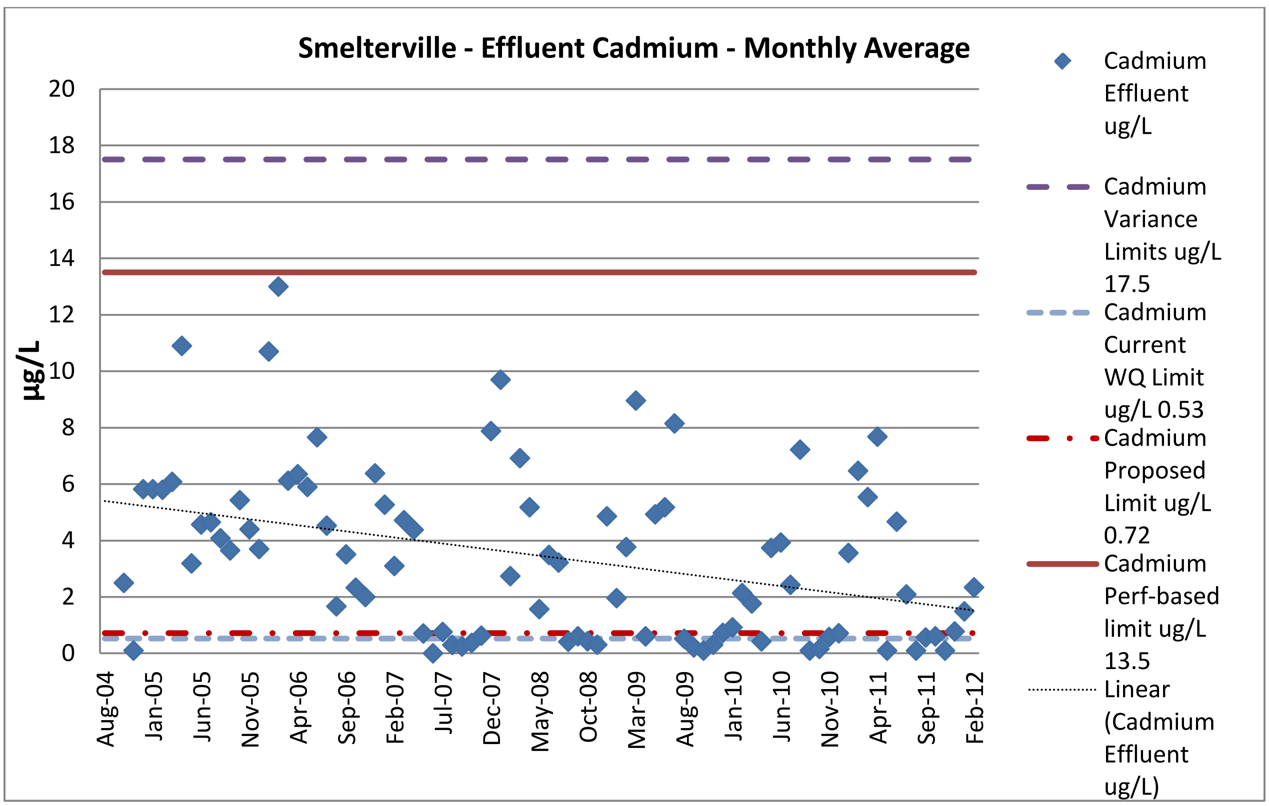
The federal regulation at 40 CFR §122.47 requires that any compliance schedule achieve compliance as soon as possible. Furthermore, if a permit establishes a compliance schedule which exceeds one year from the date of permit issuance, the schedule must set forth interim requirements and the dates for their achievement. The time between the interim dates must generally not exceed one year. If the time necessary for completion of any interim requirement is more than one year (such as construction of a control facility), the schedule must specify interim dates for the submission of reports of progress toward completion of the interim requirements and indicate a projected completion date. The regulation requires that the permit be written to require that no later than 14 days following each interim date and final date of compliance, the permittee must notify the EPA in writing of its compliance or non-compliance with the interim or final requirements, or submit progress reports as stated.

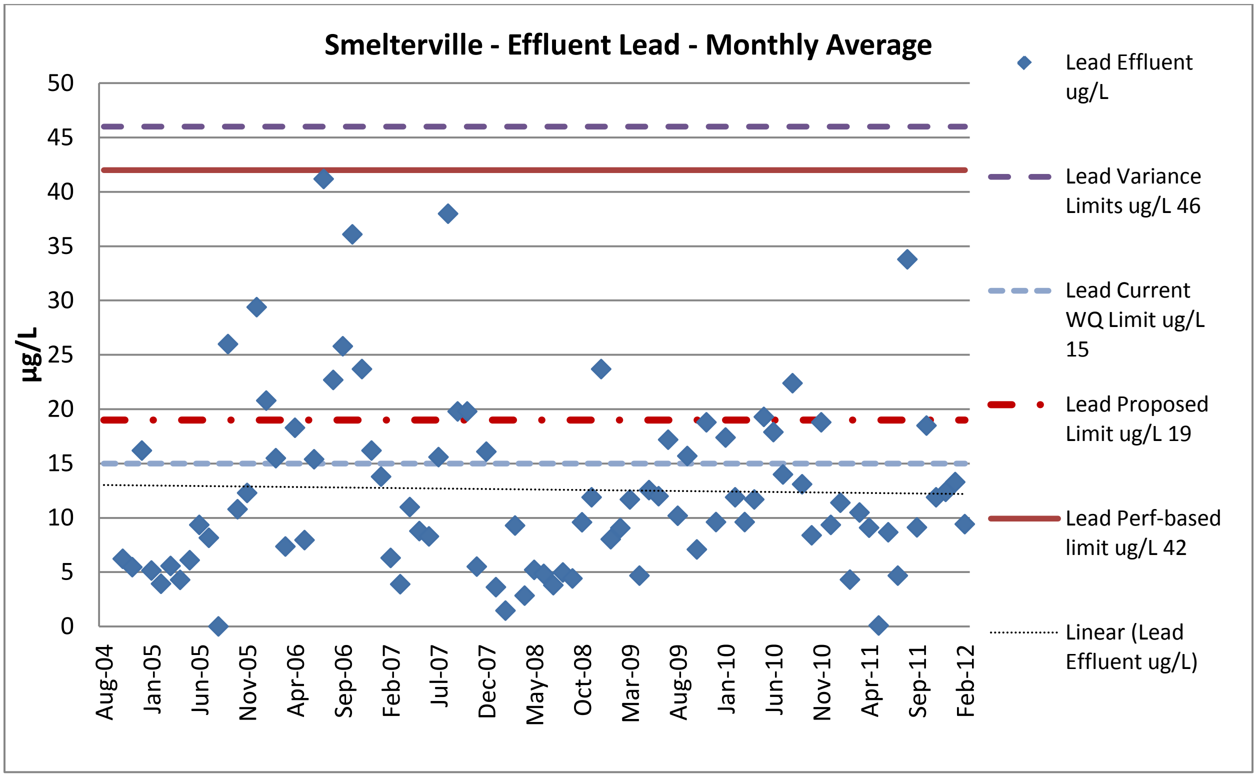
In order to grant a compliance schedule, the permitting authority must make a reasonable finding that the discharger cannot immediately comply with the water quality based effluent limit upon the effective date of the permit and that a compliance schedule is appropriate.

B. Compliance Schedule Justification

The permittee will be unable to meet the new water quality-based effluent limits for chlorine upon issuance of the proposed permit, and the proposed water quality-based effluent limits for cadmium, lead and zinc upon expiration of the variance.

The following graphs show the concentration of cadmium, lead and zinc in the effluent under the current permit as compared to the proposed permit limits. The concentrations of these metals remain at a relatively consistent level throughout the time period.





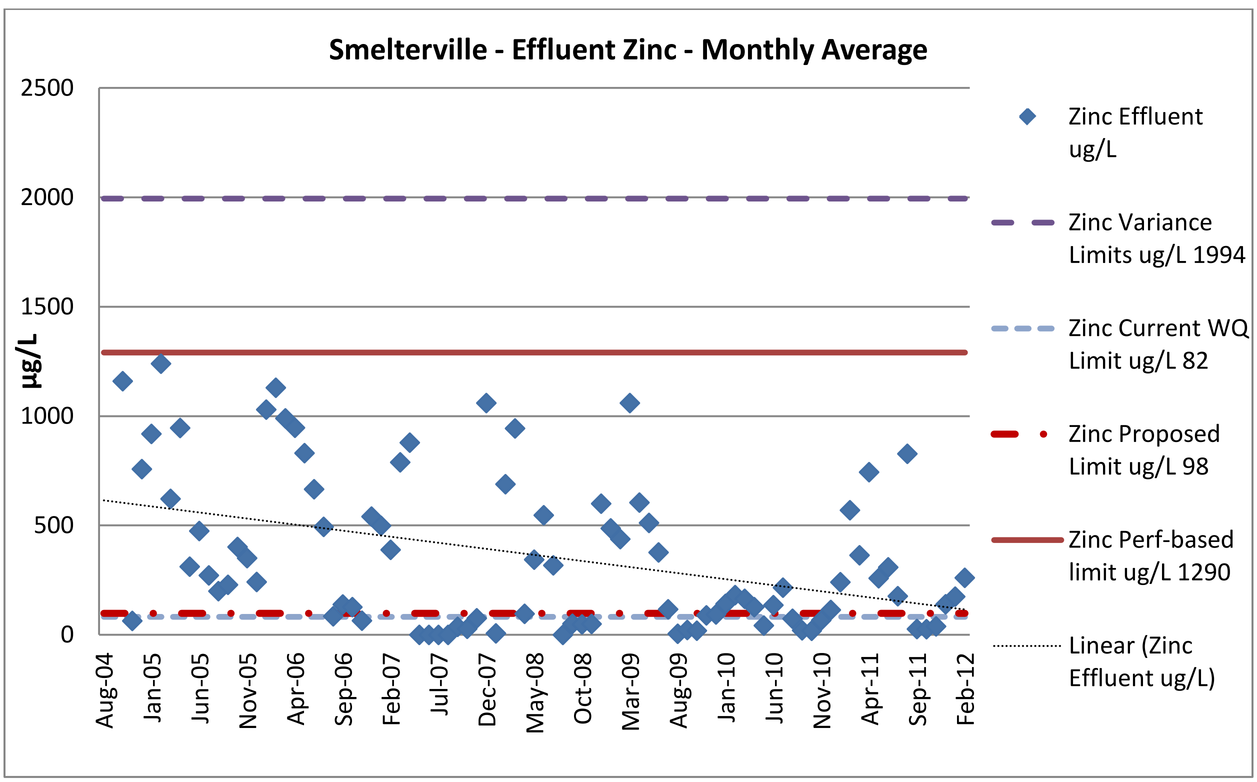


Figure 4. WWTP Historic Effluent Cadmium, Lead and Zinc

The length of the compliance schedule is set to align with the Bunker Hill Superfund remediation project. The duration of the remediation activities estimated to be 20 years. It is expected that the remediation efforts along with natural annenuation will reduce the concentrations of metals in the groundwater over the next 90 years.

The proposed permit allows for 20 years for the permittee to plan, design and construct a treatment system for metals.

The following proposed compliance schedule is based on Idaho DEQ's determination regarding the soonest possible time that compliance with the WQBELs could be achieved. The compliance schedule aims to achieve completion of construction of the necessary treatment process modifications to meet the limits within a 20-year period. The proposed permit requires both submission of written notification of completed tasks within 14 days and annual progress reports.

C. Compliance Schedule – Chlorine, Cadmium, Lead and Zinc

1. The permittee must achieve compliance with the water quality-based effluent limitations for chlorine in Part I.A.1. (Table 1) of the permit by **December 31, 2014**.
2. The permittee must achieve compliance with the final water quality-based effluent limitations for cadmium, zinc, lead and zinc in Part I.A.1. (Table 1) of the permit by **January 1, 2035**.
3. Until compliance with the water quality-based effluent limitations for chlorine, cadmium, lead and zinc, at a minimum, the permittee must complete the tasks and reports listed in Table 12.

Table 11. Tasks Required Under the Schedule of Compliance

Task No.	Due By	Task Description
1	**December 31, 2014**	**Install a Dechlorination System** The permittee must install a system to dechlorinate the effluent to meet the final water quality-based effluent limitation for chlorine. Deliverable: The permittee must submit construction completion reports to the EPA and the IDEQ.
2	**December 31, 2015**	**Facility Planning** The permittee must develop a facility plan that evaluates the options, including ceasing to discharge, that would allow the facility to meet the final water quality-based effluent limitations for cadmium, lead and zinc, and select a preferred alternative. Deliverable: The permittee must provide the facility plan to the IDEQ for review and the necessary approvals and submit a copy to the EPA.
3	**December 31, 2016 through 2029**	**Report of Progress** The permittee must submit a report of progress toward meeting the final water quality-based effluent limitations cadmium, lead and zinc Deliverable: The permittee must report annually.

Task No.	Due By	Task Description
4	**December 31, 2030**	**Treatment System Design** The permittee must complete design of the selected alternative for meeting the final water quality-based effluent limitations cadmium, lead and zinc. (The permittee may engage in renewed facility planning efforts to identify any new technologies for metals treatment. A different selected alternative may be implemented upon IDEQ approval. Planning must be done with respect to the design deadline without extending the design phase.) Deliverable: The permittee must provide the design plans and specifications to the IDEQ for the necessary approvals.
5	**December 31, 2031**	**Award Bid for Construction** The permittee must complete the awarding of the bid for construction of the project to meet the final water quality-based effluent limitations cadmium, lead and zinc. Deliverable: The permittee must provide written notification to the EPA and the IDEQ that the bid award is complete.
6	**December 31, 2032**	**Annual Report of Progress on Construction** Deliverable: The permittee must provide a report on the progress of construction.
7	**December 31, 2033**	**Construction Complete** The permittee must complete construction to achieve the final water quality-based effluent limitations for cadmium, lead and zinc. Deliverable: The permittee must submit construction completion reports to the EPA and the IDEQ.
8	**December 31. 2034**	**Meet WQ-based Effluent Limitation for cadmium, lead and zinc** The permittee must achieve compliance with the water quality-based effluent limitations cadmium, lead and zinc. Deliverable: The permittee must provide written verification to the EPA and the IDEQ that the final water quality-based effluent limitations cadmium, lead and zinc can be reliably met.

VI. 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 permit also requires the permittee to perform effluent monitoring required by the NPDES Form 2A application including parts B.6 and D so that these data will be available when the permittee applies for a renewal of its NPDES permit.

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 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 must be used for averaging if they are conducted using EPA-approved test methods (generally found in 40 CFR part 136) or as specified in the permit.

The following table presents the proposed effluent monitoring requirements for the facility. The sampling location for the final effluent must be after the last treatment unit and prior to discharge to the receiving water. The samples must be representative of the volume and nature of the monitored discharge. If no discharge occurs during the reporting period, "no discharge" must be reported on the DMR.

Table 12. Permit Monitoring Requirements

Parameter	Monitoring Requirements			
	Units	Sample Location	Sample Frequency	Sample Type
Numeric Effluent Limits				
Biochemical Oxygen Demand (BOD_5)	mg/L	Influent & Effluent	1/week	24-hour composite
	lb/day			
	% removal	% removal	1/month	Calculation[3]
Total Suspended Solids (TSS)	mg/L	Influent & Effluent	1/week	24-hour composite
	lb/day			
	% removal	% removal	1/month	Calculation[3]
E. coli Bacteria[1,2]	#/100 ml	Effluent	5/month	Grab
pH	s.u.	Effluent	5/week or continuous	Grab or measurement
Total Residual Chlorine	µg/L	Effluent	5/week or continuous	Grab or measurement
	lb/day			
Total Ammonia (as N)	mg/L	Effluent	1/week	24-hour composite
	lb/day			
Cadmium	µg/L	Effluent	1/month	24-hour composite
	lb/day			
Lead	µg/L	Effluent	1/month	24-hour composite
	lb/day			
Zinc	µg/L	Effluent	1/month	24-hour composite
	lb/day			
Flow	mgd	Influent or Effluent	Continuous	Measurement
Temperature	ºC	Effluent	5/week	Grab
Dissolved Oxygen	mg/L	Effluent	1/month	Grab
Alkalinity, Total	mg/L as $CaCO_3$	Effluent	1/month	24-hour composite
Hardness, with metals sampling	mg/L as $CaCO_3$	Effluent	1/month	24-hour composite
Nitrate + Nitrite	mg/L	Effluent	2/year	24-hour composite
Oil and Grease	mg/L	Effluent	2/year	Grab
Total Phosphorus	mg/L	Effluent	2/year	24-hour composite
Total Kjeldahl Nitrogen	mg/L	Effluent	2/year	24-hour composite

Parameter	Monitoring Requirements			
	Units	Sample Location	Sample Frequency	Sample Type

References in footnote refer to permit sections

1. The average monthly *E. coli* bacteria counts must not exceed a geometric mean of 126/100 ml. See Part VI for a definition of geometric mean.
2. Reporting is required within 24 hours of a maximum daily limit or instantaneous maximum limit violation. See I.B.2. and III.G.

   The limits for total residual chlorine are not quantifiable using EPA approved analytical methods. The Minimum Level (ML) for chlorine is 50 µg/L. When the daily maximum and average monthly effluent concentration is below the ML, EPA will consider the permittee in compliance with the total residual chlorine limitations.
3. The monthly average percent removal must be calculated from the arithmetic mean of the influent concentration values and the arithmetic mean of the effluent concentration values for that month. Influent and effluent samples must be taken over approximately the same time period.

Surface water monitoring is necessary to fully evaluate the potential of the permitted discharge to cause or contribute to non-attainment of the water quality standards.

The following table presents the proposed surface water monitoring requirements for the draft permit.

Table 13. Receiving Water Monitoring

Parameter	Units	Sample Locations	Sample Frequency	Sample Type	Method Detection Limit (MDL)
River Flow	cfs	Upstream of the point of discharge as described in I.C.1.a. and as approved by IDEQ	Continuous	Measurement, as daily average	—
Temperature	°C		Continuous	Measurement, as daily max.	—
pH	standard units		Semi-Annually[1]	Grab	—
Total Phosphorus	mg/L			Grab	Refer to 1.B.5
Total Ammonia (as N)	mg/L			Grab	Refer to 1.B.5
Hardness (as $CaCO_3$)	mg/L			Grab	Refer to 1.B.5

1. Once during low flow period (January through June) and once during high flow period (July through December).

C. Monitoring and Reporting

The draft permit includes new provisions to allow the permittee the option to submit Discharge Monitoring Report (DMR) data electronically using NetDMR. NetDMR is a national web-based tool that allows DMR data to be submitted electronically via a secure Internet application. NetDMR allows participants to discontinue mailing in paper forms under 40 CFR § 122.41 and § 403.12. The permittee may use NetDMR after requesting and receiving permission from the EPA Region 10.

Under NetDMR, all reports required under the permit are submitted to the EPA as an electronic attachment to the DMR. Once a permittee begins submitting reports using

NetDMR, it is no longer required to submit paper copies of DMRs or other reports to the EPA.

The EPA encourages permittees to sign up for NetDMR, and currently conducts free training on the use of NetDMR. Further information about NetDMR, including upcoming trainings events and contacts, is provided on the following website: http://www.epa.gov/netdmr.

VII. Sludge (Biosolids) Requirements

The EPA Region 10 separates wastewater and sludge permitting. The EPA has the authority under the CWA to issue separate sludge-only permits for the purpose of regulating biosolids. The 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.

VIII. 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 permittee is required to update the Quality Assurance Plan for the facility within 60 days of the effective date of the final permit. The Quality Assurance Plan shall include 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 permittee 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 of the effective date of the final permit. The plan shall be retained on site and made available to the EPA and the 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 toxic pathogens and other toxic pollutants. 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 EPA-approved state water quality standards.

The permit contains language to address SSO reporting, public notification, and operation and maintenance of the collection system. The permit requires that the permittee identify SSO occurrences and their causes. Additionally, 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 the EPA inspectors to evaluate a collection systems 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. Design Criteria

The previous permit included a condition that required the permittee to compute average values for flow, TSS and BOD_5 loading entering the facility. When average values reached 85% of the design criteria below, the permittee was to develop a plan and schedule for addressing design capacity constraints.

Table 14. WWTP Design Criteria

Criteria	Value	85% of Design	Units
Average Flow	0.25	0.21	mgd
Influent BOD_5 Loading	Not specified		lbs/day
Influent TSS Loading	Not specified		lbs/day

The proposed draft permit again contains a provision requiring the permittee to compare influent flow and loading to the facility's design flow and loading and prepare a facility plan for maintaining compliance with NPDES permit effluent limits when the annual average flow or loading exceeds 85% of the design criteria values for three consecutive months.

E. Pretreatment Requirements

The proposed draft permit requires the permittee to control industrial dischargers, pursuant to 40 CFR part 403. Indirect dischargers to the treatment plant must comply with the applicable requirements of 40 CFR Part 403, any categorical pretreatment standards promulgated by the EPA, and any additional or more stringent requirements imposed by the City of Smelterville as part of its approved pretreatment program or sewer use ordinance (e.g. local limits).

F. Standard Permit Provisions

Sections III, IV and V of the draft permit contains 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.

IX. Other Legal Requirements

A. Endangered Species Act

The Endangered Species Act (ESA) requires federal agencies to consult with the National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) if their actions could beneficially or adversely affect any threatened or endangered species.

A review of threatened and endangered species located in Idaho finds that there are no threatened and endangered species in Shoshone County, refer to Appendix F. Based on lack of species present and the stringent effluent limits imposed by the NPDES permit, the EPA has determined that reissuance of the permit will have no effect on threatened or endangered species or their critical habitat in the vicinity of the discharge. Therefore, consultation with NMFS and USFWS is not required under Section 7 of ESA.

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 requires the EPA to consult with NMFS when a proposed discharge has the potential to adversely affect 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.

A review of EFH areas in Idaho finds that there is no EFH in Shoshone County. As such, the EPA has determined that reissuance of the NPDES permit will not adversely affect EFH, reference Appendix F.

C. State Certification and Tribal Consultation

Section 401 of the CWA requires EPA to seek State certification before issuing a final permit. As a result of the certification, the State may require more stringent permit conditions or additional monitoring requirements to ensure that the permit complies with water quality standards, or treatment standards established pursuant to any State law or regulation.

The Coeur d'Alene Tribe reservation is located at the south end of Lake Coeur d'Alene. The South Fork Coeur d'Alene River joins the North Fork Coeur d'Alene River near Pinehurst to form the Coeur d'Alene River. The Coeur D'Alene River flows into Lake Coeur d'Alene just north of the reservation boundary as shown in the figure below. The EPA invited the tribe to review and/or consult on this permit because of the discharge's potential to impact Lake Coeur d'Alene. Refer to Appendix G and H.

D. Permit Expiration

The permit will expire five years from the effective date.

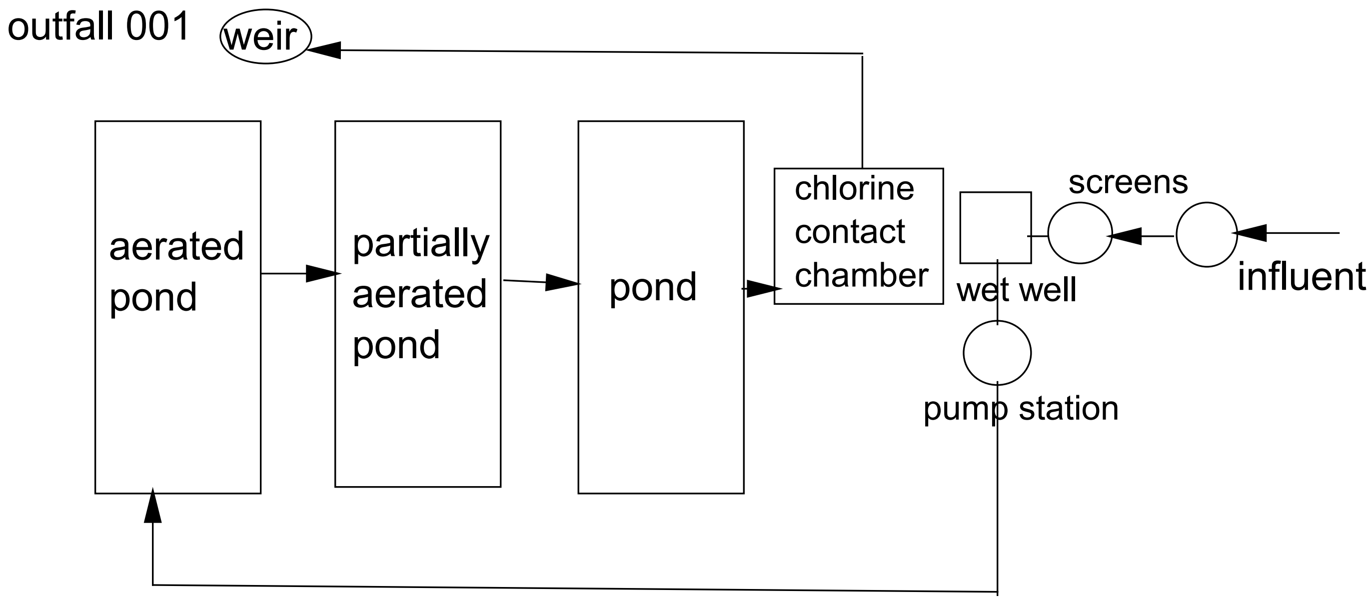
X. References

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

Water Pollution Control Federation. Subcommittee on Chlorination of Wastewater. *Chlorination of Wastewater.* Water Pollution Control Federation. Washington, D.C. 1976.

SF Coeur d'Alene River TMDL Revision and Addendum, Idaho Department of Environmental Quality, February 2010.

Appendix A: Process Diagram



Appendix B: Discharge Monitoring Report Summary and Effluent Data

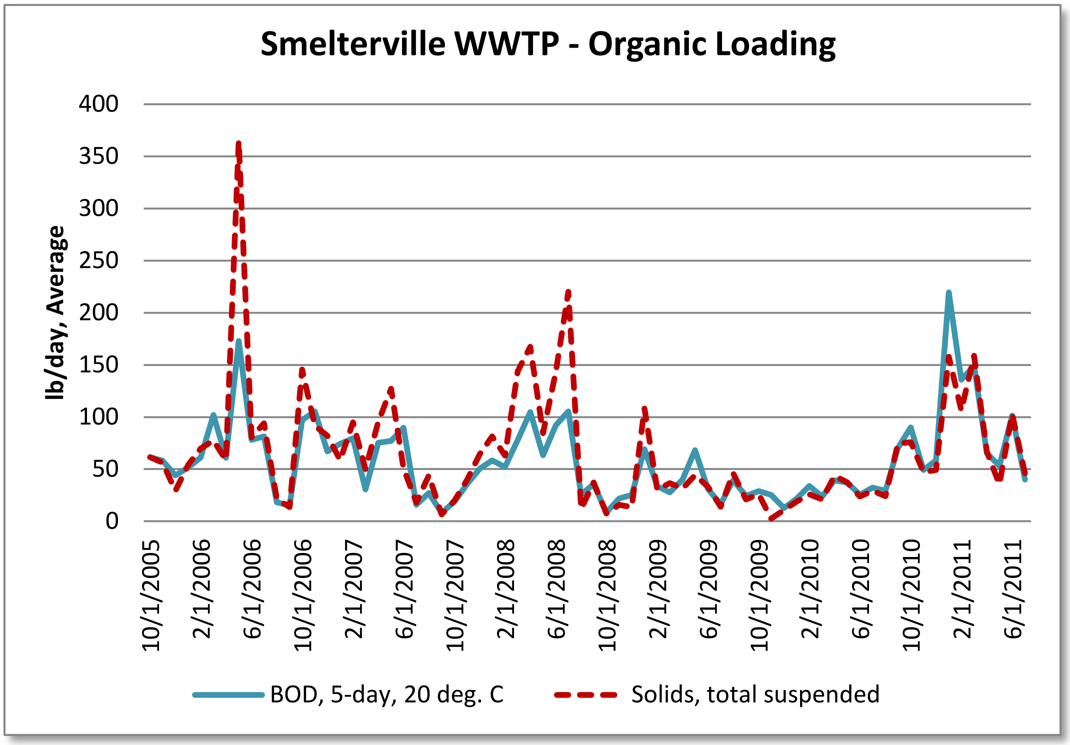
A. DMR Data Summary August 2004 through July 2011

Monitoring Location Desc	Raw Sewage Influent	Raw Sewage Influent	Effluent	Effluent	Effluent	Effluent	Effluent	Percent Removal	Effluent	Effluent	Effluent	Effluent	Percent Removal	Effluent	Effluent
Parameter Desc	BOD, 5-day, 20 deg. C	Solids, total suspended	Flow, in conduit or thru treatment plant	BOD, 5-day, 20 deg. C	BOD, 5-day, 20 deg. C	BOD, 5-day, 20 deg. C	BOD, 5-day, 20 deg. C	BOD, 5-day, percent removal	Solids, total suspended	Solids, total suspended	Solids, total suspended	Solids, total suspended	Solids, suspended percent removal	pH	pH
Statistical Base Short Desc	MO AVG	MO AVG	DAILY MX	MO AVG	MO AVG	WKLY AVG	WKLY AVG	MN % RMV	MO AVG	MO AVG	WKLY AVG	WKLY AVG	MN % RMV	MAXIMUM	MINIMUM
Limit Unit Short Desc	mg/L	mg/L	Mgal/d	lb/d	mg/L	lb/d	mg/L	%	lb/d	mg/L	lb/d	mg/L	%	SU	SU
Limits	**na**	**na**	**0.25**	**94**	**45**	**136**	**65**	**65**	**94**	**45**	**136**	**65**	**65**	**9**	**6.5**
eff 7/31/09															
8/31/2004	27.5	13.5		2.5	7	3	8	75	3	10.5	3	11		7.5	6.7
9/30/2004	55	27.5		4	2.5	4	3	95	3.5	2.5	5	3		7.6	6.9
10/31/2004	81	56.5		1	1.5	1	2	98	4.5	8.5	5	10		7.5	7.1
11/30/2004	110.5	88.5		1	1	1	1	99	1.5	5	2	6		7.5	7
12/31/2004	33.5	22.5		3	1.5	4	2	96	9	5	9	5		7.5	7
1/31/2005	85.5	82.5		1	1	1	1	99	1	1.5	1	2		7.6	6.9
2/28/2005	30	31		2	3	2	3	90	16	19.5	17	22		7.4	7.1
3/31/2005	77.5	75		1.25	9	1.5	10	88	2	10.5	2	11		7.5	6.9
4/30/2005	18.25	20.5		29	11.5	30	12	37	29	11.5	30	12		7.5	7
5/31/2005	27	31		3.5	2	5	3	91	3	1.5	4	2		7.5	7
6/30/2005	36	33.5		4	5.5	4	6	85	1	2	1	2		6.8	7.5
7/31/2005	172	202		34	8.25	51	12.5	95	43	11	88	21.5		7.5	7
8/31/2005															
9/30/2005															
10/31/2005	106	106	0.069635	5	3	7	3.5	93	3	5	3.5	6		7.5	7.2
11/30/2005	95	92	0.07349	2	3.5	5	8.5	95	4	6	6.5	7		7.1	7.6
12/31/2005	65	43.5	0.081002	4	5	9.5	14	86	5	8	9	13		7.5	7.1
1/31/2006	10.5	11	0.59021	18.5	4	51.5	10.5	55	11.5	2	27.5	5.5	80	7.3	6.8
2/28/2006	21	24	0.349035	7	2.5	9	3	88	4.5	1.5	6	2	94	7.4	7.1
3/31/2006	29	22	0.421486	17.5	7	23	9.5	58	15	6	22	9	47	7.4	7.2
4/30/2006	15.25	14.75	0.478183	31.5	7.88	36	9	42.5	34.5	8.63	56	14	42	7.5	7.2
5/31/2006	43.6	92	**0.475159**	19	8.1	33	14	79	21	8.6	31	13	81	7.6	7.2
6/30/2006	23.25	24	0.40234	15	4	17	4.5	73	10.78	3.25	15	4.5	80	7.6	7.2
7/31/2006	58	67	0.168183	5	7	7	10	81	6	8	13	17.5	71	7.5	7.2
8/31/2006	121	140	0.018152	2	11	2	14	88	2	12	2.5	17	88	7.6	7.2
9/30/2006	100	91	0.018152	2	13	2	15	87	2	11	3	19	80	7.6	7.4
10/31/2006	229	343	0.05091		10.5		12	90	4	10.75	5	13	87	7.5	7
11/30/2006	49.5	42.9	0.255571	5.8	4.6	8.5	6.5	73	4.4	4.3	7	7	76	7.5	7.1
12/31/2006	35	43	0.229137	5	3	6	3	86	3.5	1	4	2	89	7.4	7.1
1/31/2007	33.1	26.2	0.269209	7.4	3.3	11	5	74	2.4	1.2	3	1.5	92	7.5	7.2
2/28/2007	57	68	0.167608	8	6	10	7	65	3	2	3.5	2.5	87	7.5	7.2
3/31/2007	14	23	0.261269	4	3	7	4	78	3	1	4	2	86	7.4	7.1
4/30/2007	30	38	0.300969	22	8	38	15	49	26	10	43	17	56	7.6	7.2
5/31/2007	48	79	0.193097	12	8	16	10	77	10	6	22	13.5	90	7.5	7.2
6/30/2007	97	55	0.110909	5.5	6	6	7	80	4	4	5.5	5.5	84	7.6	7.4
7/31/2007	121	136	0.015683	1.25	11	2	15	86	2.38	16.13	3.5	27	75	7.5	7.2
8/31/2007	179	291	0.018152	1.3	16.5	2	19	88	2.8	34	3	39	76	7.6	7.2
9/30/2007	149	124	0.006445	1	15	1	21	88	2	30.5	1.75	35	66.75	7.5	7.2
10/31/2007	124	131.4	0.018152	1.4	9.9	3	23	91	3	22.8	3.5	29	82	7.6	7.2
11/30/2007	148	164	0.028709	1	10	2	12	92	2	12	2.75	14	90	7.6	7.2
12/31/2007	89.5	114	0.06764	7	12.5	8	14	85	4	7.5	4.5	8	93	7.7	7.3
1/31/2008	91	127	0.076802	10	16	11	16.5	76	2.6	4	3	5	92	7.6	7.2
2/29/2008	57	69	**0.10952**	13	14	15	16	72	5	5	5	5	92	7.6	7.1
3/31/2008	20	37	0.467302	35	7	78	12	77.5	84	13	152	21	86	7.6	7.1
4/30/2008	38.9	62.1	0.323348	11.5	4.3	16	6	88	11.1	4.4	18	6.5	92	7.6	7.1
5/31/2008	24	32	0.316667	17.5	7	29	11	73	40	15	93	35.5	50	7.6	7.2
6/30/2008	36	56	**0.307106**	25	10	33	13	70	32.5	13	46.5	18	60	7.7	7.3
7/31/2008	110	230	0.114728	11.8	12.5	14.5	15.5	81	14.75	15.75	17	17	88	7.7	7.3
8/31/2008	169	77	**0.018152**	2.5	17.5	3	22.5	87	2.5	16.8	3	19	72	7.5	7.2
9/30/2008	237	247	0.018152	2	15	3	17.5	92	2.5	17	3	19.5	88	7.6	7.2
10/31/2008	182	158	0.005644	5.5	11.9	6	13	91	7.1	15.1	9.5	20	86	7.6	7.2
11/30/2008	162	116	0.0162	1	7.75	1	10.5	93	1	8	1.5	9	89	7.6	7.2
12/31/2008	168	90	0.018152	1	7	2	14	90	1	8	2	10.5	95	7.6	7.2
1/31/2009	205	321	0.040404	4	13	7	21	88	2	6	2.5	7	91	7.6	7.3
2/28/2009	136	122	0.029663	6	23	6	24.5	76	1	7	2	9	94	7.6	7.2
3/31/2009	120	158	0.027732	3	13.5	4.5	19.5	85	1	6	1.5	7	96	7.5	7.1
4/30/2009	157	123.5	0.030567	4	16	4.5	17.5	86	4	14.5	6	22.5	78	7.6	7.2
5/31/2009	301	196	0.027185	3	13	3.5	15.5	94	1	5	1.5	6.5	96	7.6	7.2
6/30/2009	208	222	0.018	2	2.6	3	33.5	77	3	31	4	43	67	7.6	7.2
7/31/2009	146.2	123	0.0135	3.5	32.5	5.5	50.5	77	5.5	52	6.5	59	53	7.5	7.1
8/31/2009	263	308	0.018	2	26	3	30	78	2.5	34	4.5	39	73	7.6	7.2
9/30/2009	294	250	0.01	0.2	17.3	3	25	90	2	25	3	34	67	7.6	7.1
10/31/2009	171	152	0.020415	1	4	1	5	97	3	19	4.5	21.5	76	7.6	7.1
11/30/2009	168	17.38	0.018	0.83	5.5	1.9	12.5	94	0.28	1.92	0.39	2.59	87	7.7	7.1
12/31/2009	192	163	0.008	0.89	12.4	2	25	94	0.52	8	0.59	10.5	88	7.6	7.2
1/31/2010	148	128	0.0176	3	20.5	4	27	83	1.5	10.5	2	14	88	7.6	7.4
2/28/2010	225	172.4	0.018	1.83	12.1	2.95	19.5	92	1.01	6.69	1.3	8.5	95	7.6	7.2
3/31/2010	146	130	0.0194	1.8	11	2.6	16	86	2.6	15.9	3.3	20.5	75	7.5	7.4
4/30/2010	179	199	0.0264	3.25	14.7	5.2	23.5	92	3.7	16.8	8.4	38	91	7.6	7.3
5/31/2010	151	152	0.0294	4	15	5	20	91	4	14	5	19	90	7.6	7.2
6/30/2010	141	131	0.021878	2.5	14	3.5	18	88	3.5	20	6	21	85	7.6	7.3
7/31/2010	213	193	0.018152	1.75	19	2.9	31	83	3.88	40	4.3	46	71	7.6	7.3
8/31/2010	193	158	0.018152	4	24	4.5	29.5	90	7	49	11	74	67	7.6	7.3
9/30/2010	254	269	0.033207	5	19	8	24	92	9	31	9.5	34.5	81	7.6	7.2
10/31/2010	309	260	0.0349771	6	21	7	25	94	10	37	11	38.5	85	7.6	7.2
11/30/2010	165	157	0.035862	4	14	6	21	91	7	25	10.5	35	82	7.6	7.2
12/31/2010	172	145	0.040794	3	8	6	18	91	4.3	12.6	6	18	77	7.6	7.4
1/31/2011	103	74	0.255571	14.75	16.75	22	25	70	6.6	7.6	7.5	8.5	85	7.5	6.9
2/28/2011	115	90	0.141556	11.38	10.13	18.5	16.5	87	6.6	5.8	7.7	7	91	7.6	7.2
3/31/2011	127	135	0.141006	22	20	27	23	84	12	10	14	12	89	7.6	7.2
4/30/2011	84.5	86.38	0.0927	2.28	3.44	4	6	84	8	12.88	9.5	15	81	7.6	7.2
5/31/2011	122	81.6	0.052205	4.14	9.6	7	16	83	6.5	14	10	23	79	7.6	7.2
6/30/2011	131.2	133.2	0.092736	10.7	19.6	12	22	82	8.2	14.6	12	22	82	7.6	7.3
7/31/2011	145	166	0.033207	9	32	10	37	83	10	36	12.5	44	75	7.6	7.2
Average	117.4	114.7	0.12	7.1	10.6	10.4	14.8	83.5	8.0	12.9	12.4	17.0	80.9	7.5	7.2
Minimum	10.5	11	0.005644	0.2	1	1	1	37	0.28	1	0.39	1.5	42	6.8	6.7
Maximum	309	343	0.59021	35	32.5	78	50.5	99	84	52	152	74	96	7.7	7.6
Count	82	82	70	81	82	81	82	82	82	82	82	82	67	82	82
Std Dev	76.1	81.1	0.1	8.3	7.1	14.3	9.5	12.3	13.4	11.4	24.8	14.6	12.6	0.1	0.1
CV	0.65	0.71	1.25	1.16	0.67	1.37	0.64	0.15	1.67	0.88	1.99	0.86	0.16	0.02	0.02
95th Percentile	253.2	268.6	0.4	25.0	22.9	36.0	30.0	96.0	32.3	35.9	46.3	42.8	94.7	7.6	7.4
5th Percentile	20.1	20.6	0.0	1.0	2.0	1.0	3.0	58.4	1.0	1.5	1.3	2.0	53.9	7.4	6.9

Monitoring Location Desc	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent
Parameter Desc	Chlorine, total residual	Chlorine, total residual	Chlorine, total residual	Chlorine, total residual	Chlorine, total residual	E. coli, MTEC MF	E. coli, MTEC-MF	Floating solids or visible foam-visual	Nitrite plus nitrate total 1 det. (as N)	Nitrogen, ammonia total (as N)	Nitrogen, ammonia total (as N)	Nitrogen, ammonia total (as N)	Nitrogen, ammonia total (as N)	Nitrogen, Kjeldahl, total (as N)	Temperature, water deg. centigrade	Phosphorus, total (as P)
Statistical Base Short Desc	DAILY MX	DAILY MX	DAILY MX	MO AVG	MO AVG	DAILY MX	MO AVG	MAXIMUM	DAILY MX	DAILY MX	DAILY MX	MO AVG	MO AVG	DAILY MX	DAILY MX	DAILY MX
Limit Unit Short Desc	mg/L	lb/d	mg/L	lb/d	mg/L	#/100mL	#/100mL	Y 1;N 0	mg/L	lb/d	mg/L	lb/d	mg/L	mg/L	deg C	mg/L
Limits	**0.5**					**576**	**126**		**report**	**1095**	**525**	**284**	**136**	**report**	**report**	**report**
eff 7/31/09		1.2	0.56	0.85	0.41											
8/31/2004	0.2		0.2													
9/30/2004	13		13													
10/31/2004	0.3		0.3													
11/30/2004	0.2		0.2													
12/31/2004	0.2		0.2													
1/31/2005	0.3		0.3													
2/28/2005	0.4		0.4													
3/31/2005	0.4		0.4													
4/30/2005	0.3		0.3													
5/31/2005	0.3		0.3													
6/30/2005	0.3		0.3													
7/31/2005																
8/31/2005																
9/30/2005																
10/31/2005	0.4		0.4													
11/30/2005	0.3		0.3													
12/31/2005	0.5		0.5													
1/31/2006	0.5		0.5			154.1	14.4	0	0.633	29	6	14	3	7.82	2.5	1.12
2/28/2006	0.2		0.2			1	1	0	0.612	7	2.43	6	1.99	3.15	8	0.419
3/31/2006	0.3		0.3			93.4	12.3	0	0.457	5	3.04	2	2.33	4.71	6	0.629
4/30/2006	0.3		0.3			86	18	0	1.23	3	2.13	1.5	1.159	3.7	10	0.586
5/31/2006	0.3		0.3			461	52	0	0.623	109	2.77	50	1.81	2.93	14	0.444
6/30/2006	0.2		0.2			365.4	56	0	0.695	3.5	3.85	2	2.58	3.4	20	0.474
7/31/2006	0.2		0.2			1	1	0	0.05	0.0584	6.32	0.0411	5.21	5.58	31	0.803
8/31/2006	0.2		0.2			48.7	8.5	0	0.415	14	9.63	11	7.67	8.09	22	1.09
9/30/2006	0.5		0.5			10	1	0	0.444	11	16	9	13	13.4	23	1.61
10/31/2006	0.3		0.3			19.5	3	0	0.068	33	15	28.5	14.5	17.8	13	2
11/30/2006	0.3		0.3			727	85.3	0	15.1	36	15.5	27.5	12.1	0.5	10	1.85
12/31/2006	0.4		0.4			1	1	0	0.911	27	5.36	12.2	5.02	6.24	8	0.942
1/31/2007	0.2		0.2			34.5	9	0	0.41	14.87	7.26	10.88	5.15	5.98	3	0.832
2/28/2007	0.3		0.3			116.9	32.2	0	0.855	16.04	8.14	12.38	6.35	9.13	9	1.46
3/31/2007	0.3		0.3			37.9	5.6	0	1.25	8.1	2.3	6.19	1.9	3.49	7	0.482
4/30/2007	0.3		0.3			4	1	0	0.82	0.00057	2.28	0.00047	1.9	3.31	11.5	0.399
5/31/2007	0.3		0.3			313	62	0	0.679	0.00065	6.56	0.00048	4.81	4.99	17	0.931
6/30/2007	0.3		0.3			191	25	0	0.583	0.0038	7.87	0.00631	6.83	8.08	16	1.44
7/31/2007	0.2		0.2			9.7	2	0	0.1	0.0013	10	0.0011	8.59	10.1	25	1.27
8/31/2007	0.3		0.3			98	16	0	0.39	0.001	11.4	0.008	10.23	16.7	21	2.08
9/30/2007	0.2		0.2			303	116	0	0.588	74	13.9	69	12.8	16.2	20	2.64
10/31/2007	0.3		0.3			48.7	23.2	0	0.3	0.0012	16	0.001	14.38	16.3	12	2.16
11/30/2007	0.04		0.04			387.3	43.1	0	0.13	0.407	17	0.3967	16.6	18.8	8	2.37
12/31/2007	0.3		0.3			5.1	1.4	0	0.5	0.0084	15	0.0077	13.8	18.4	3	2.66
1/31/2008	0.4		0.4			0	0	0	1.46	0.0768	12	0.0743	11.6	13.3	3	2.18
2/29/2008	0.3		0.3			206	30	0	1.36	114	12.6	0.95	10.5	12.6	9	2.14
3/31/2008	0.3		0.3			1	1	0	0.152	20	5.1	11	2.92	6.92	8	1.2
4/30/2008	0.3		0.3			9.7	2.1	0	0.997	7.9	2.93	7.2	2.68	4.21	10	0.527
5/31/2008	0.3		0.3			22	5	0	2.15	264	10	52	2	4.36	13	0.748
6/30/2008	0.2		0.2			613	69	0	0.215	238	4.43	99	3.89	6.41	20	1.42
7/31/2008	0.3		0.3			1	0	0	1.88	19	20	4	5	6.98	22	1.27
8/31/2008	0.4		0.4			1	1	0	0.674	19	12.4	18	10.11	10.2	22	2.11
9/30/2008	0.3		0.3			1	1	0	17.5	2.45	16.2	2.25	14.9	0.366	15	2.21
10/31/2008	0.3		0.3			45	6	0	2.56	0.0884	18.8	0.0786	16.7	19	12	2.3
11/30/2008	0.3		0.3			1	1	0	0.4	297	22	270	20	19.4	8	2.43
12/31/2008	0.3		0.3			1	0	0	0.1	34	23	33	22	23.3	8	3.4
1/31/2009	0.2		0.2			49.5	7	0	0.1	0.006	17.8	0.0055	16.35	19.2	3	3.21
2/28/2009	0.3		0.3			0	0	0	0.1	5.9	21.5	5.4	19.68	20.9	5	2.79
3/31/2009	0.2		0.2			52.8	2	0	0.1	6.7	24.5	4.14	18.4	23.2	8	3.14
4/30/2009	0.3		0.3			1	1	0	0.36	0.0326	12.8	0.0293	11.5	13.6	9	1.96
5/31/2009	0.3		0.3			1	1	0	0.1	5	22	5	18	17.4	14	2.21
6/30/2009	0.3		0.3			314	90	0	1.53	2	23	2	19	22	20	3.69
7/31/2009	0.4		0.4			1	1	0	0.1	2.37	21	1.86	16.5	26.2	24	4.78
8/31/2009	0.3		0.3			1	1	0	0.1	2.2	22.4	2	20.3	22.6	23	2.8
9/30/2009	0.3		0.3			1	1	0	0.1	1.66	20	1.66	20	25	18	3.31
10/31/2009	0.4		0.4			1	1	0	0.1	3.7	22.3	3.5	20.8	23	14	2.36
11/30/2009	0.3		0.3			1.7	1.7	0	0.1	3.9	26.2	3.5	23.4	24.7	12	2.37
12/31/2009	0.3		0.3			2.4	2.4	0	0.1	1.97	29.6	1.87	28.1	27.5	4	3.47
1/31/2010	0.3		0.3			1	1	0	4.92	3.8	26	3.4	23.3	23.9	4	4.98
2/28/2010	0.3		0.3			160.7	2.1		0.1	3.79	25.3	3.48	23.2	25.6	4	4.05
3/31/2010	0.3		0.3			290.9	1.9	0	0.1	4.02	25.7	3.95	24.4	26.7	4	3.91
4/30/2010	0.3		0.3			1.3	1.3	0	0.1	5.9	26.6	5.7	26	28.6	12	3.87
5/31/2010	0.4		0.4			1	1	0	0.1	5.1	22.2	4.8	21.6	26.3	14	3.52
6/30/2010	0.4		0.4			3.6	3.6	0	0.1	3.7	20.3	3.5	19.7	23.5	21	3.38
7/31/2010	0.3		0.3			1	1	0	0.1	1.73	18.5	1.6	17.1	22.4	21	5.6
8/31/2010	0.3		0.3			2.4	2.4	0	0.1	2.3	15	1.9	12.7	18.6	22	3.57
9/30/2010	0.3		0.3			14.6	14.4	0	0.1	6	22	5	19	22.2	17	3.43
10/31/2010	0.3		0.3			1.2	1.2	0	0.1	6.5	22.9	6	22	22.8	15	3.37
11/30/2010	0.3		0.3			6.7	6.7	0	10.2	8.49	29.1	7.56	25.9	27.4	11	2.65
12/31/2010	0.3		0.3			416	2	0	0.1	8.03	23.6	7.53	22.1	27.2	4	3
1/31/2011	0.3		0.3			435.2	2	0	0.1	19.7	22.5	17.67	20.2	24.5	6	2.77
2/28/2011	0.3		0.3			1	1	0	0.207	19.5	17.1	18.9	16.55	18.4	6	2.53
3/31/2011	0.3		0.3			5.6	5.6	0	0.1	24	20	22	19	21.8	6	2.69
4/30/2011	0.2		0.2			4.1	1.2	0	0.11	9.1	14.6	8.4	13.48	17.9	9	2.48
5/31/2011	0.3		0.3			1	1	0	0.1	6.1	14.1	5.5	12.7	14.6	15	1.84
6/30/2011	0.4		0.4			1	1	0	0.1	9	16.9	8.5	15.86	17.6	17	2.44
7/31/2011	0.3		0.3			2.6	2.6	0	0.1	6	20	4	16	22.4	20	4.01
Average	0.5	#DIV/0!	0.5	#DIV/0!	#DIV/0!	92.5	13.0	0.0	1.2	23.8	15.4	13.9	13.4	15.4	12.7	2.3
Minimum	0.04	0	0.04	0	0	0	0	0	0.05	0.00057	2.13	0.00047	1.159	0.366	2.5	0.399
Maximum	13	0	13	0	0	727	116	0	17.5	297	29.6	270	28.1	28.6	31	5.6
Count	81	0	81	0	0	67	67	66	67	67	67	67	67	67	67	67
Std Dev	1.7	#DIV/0!	1.7	#DIV/0!	#DIV/0!	169.4	25.4	0.0	3.3	61.1	7.8	41.7	7.6	8.5	7.0	1.2
CV	3.73	#DIV/0!	3.73	#DIV/0!	#DIV/0!	1.83	1.96	#DIV/0!	2.87	2.57	0.51	3.00	0.57	0.55	0.55	0.54
95th Percentile	0.4	#NUM!	0.4	#NUM!	#NUM!	429.4	66.9	0.0	4.2	112.5	26.1	51.4	24.1	27.1	23.0	4.0
5th Percentile	0.2	#NUM!	0.2	#NUM!	#NUM!	1.0	0.3	0.0	0.1	0.0	2.5	0.0	1.9	3.2	3.0	0.5

Monitoring Location Desc	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Downstream Monitoring	Downstream Monitoring	Upstream Monitoring	Upstream Monitoring	Upstream Monitoring
Parameter Desc	Cadmium, total recoverable	Cadmium, total recoverable	Cadmium, total recoverable	Cadmium, total recoverable	Lead, total recoverable	Lead, total recoverable	Lead, total recoverable	Lead, total recoverable	Zinc, total recoverable	Zinc, total recoverable	Zinc, total recoverable	Zinc, total recoverable	pH	Temperature, water deg. centigrade	Chlorine, total residual	Nitrogen, ammonia total (as N)	Phosphorus, total (as P)
Statistical Base Short Desc	DAILY MX	DAILY MX	MO AVG	MO AVG	DAILY MX	DAILY MX	MO AVG	MO AVG	DAILY MX	DAILY MX	MO AVG	MO AVG	DAILY MX	DAILY MX	DAILY MX	DAILY MX	DAILY MX
Limit Unit Short Desc	lb/d	ug/L	lb/d	ug/L	lb/d	ug/L	lb/d	ug/L	lb/d	ug/L	lb/d	ug/L	SU	deg C	mg/L	mg/L	mg/L
Limits	**0.077**	**37**	**0.048**	**23**	**0.18**	**85**	**0.096**	**46**	**18**	**8800**	**7.6**	**3651**	**report**	**report**	**report**	**report**	**report**
eff 7/31/09	0.001	0.53	0.001	0.39	0.03	15	0.002	7.7	0.17	82	0.12	60					
8/31/2004																	
9/30/2004																	
10/31/2004	0.0019	2.5	0.0019	2.5	0.0047	6.24	0.0047	6.24	0.09	1160	0.09	1160					
11/30/2004	0.0001	0.1	0.0001	0.1	0.0014	5.47	0.0014	5.47	0.02	64	0.02	64					
12/31/2004	0.0106	5.82	0.0106	5.82	0.0297	16.2	0.0297	16.2	1.39	758	1.39	758					
1/31/2005	0.0044	5.82	0.0044	5.82	0.0038	5.16	0.0038	5.16	0.7	919	0.7	919					
2/28/2005	0.0184	5.8	0.0184	5.8	0.0124	3.94	0.0124	3.94	3.93	1240	3.93	1240					
3/31/2005	0.0025	6.08	0.0025	6.08	0.023	5.58	0.023	5.58	0.26	622	0.26	622					
4/30/2005	0.035	10.9	0.035	10.9	2.8	4.3	2.8	4.3	3	946	3	946					
5/31/2005	0.0069	3.19	0.0069	3.19	0.013	6.11	0.013	6.11	0.67	312	0.67	312					
6/30/2005	0.0054	4.57	0.0054	4.57	0.011	9.36	0.011	9.36	0.56	475	0.56	475					
7/31/2005	0.002	4.65	0.002	4.65	0.0034	8.17	0.0034	8.17	0.11	272	0.11	272					
8/31/2005	0.001	4.08	0.001	4.08	0.0041	0.0162	0.0041	0.0162	0.05	200	0.05	200					
9/30/2005	0.0003	3.65	0.0003	3.65	0.0022	26	0.0022	26	0.02	229	0.02	229					
10/31/2005	0.0032	5.43	0.0032	5.43	0.0063	10.8	0.0063	10.8	0.23	402	0.23	402					
11/30/2005	0.0033	4.4	0.0033	4.4	0.0092	12.3	0.0092	12.3	0.27	351	0.27	351					
12/31/2005	0.0015	3.7	0.0015	3.7	0.0123	29.4	0.0123	29.4	0.01	242	0.01	242					
1/31/2006	0.0598	10.7	0.1196	10.7	0.1162	20.8	0.2324	20.8	5.76	1030	5.76	1030	0	0	0	0	0
2/28/2006	0.0607	13	0.1214	13	0.0724	15.5	0.0724	15.5	5.27	1130	5.27	1130	0	0	0	0	0
3/31/2006	0.0081	6.12	0.0081	6.12	0.0099	7.37	0.0099	7.37	1.32	990	1.32	990	0	0	0	0	0
4/30/2006	0.024	6.35	0.024	6.35	0.0687	18.3	0.0687	18.3	3.55	947	3.55	947	0	0	0	0	0
5/31/2006	0.0128	5.9	0.0128	5.9	0.0173	7.96	0.0173	7.96	1.8	831	1.8	831	0	0	0	0	0
6/30/2006	0.0308	7.66	0.0308	7.66	0.0616	15.4	0.0616	15.4	2.67	666	2.67	666	0	0	0	0	0
7/31/2006	0.006	4.53	0.006	4.53	0.055	41.2	0.055	41.2	0.66	494	0.66	494	7	15	0.1	0.05	0.06
8/31/2006	0.0001	1.67	0.0001	1.67	0.0019	22.7	0.0019	22.7	0.01	85	0.01	85	0	0	0	0	0
9/30/2006	0.0003	3.51	0.0003	3.51	0.0022	25.8	0.0022	25.8	0.01	139	0.01	139	0	0	0	0	0
10/31/2006	0.001	2.33	0.001	2.33	0.0151	36.1	0.0151	36.1	0.05	127	0.05	127	7.2	10	0	0.0159	0.113
11/30/2006	0.0008	2	0.0008	2	0.0099	23.7	0.0099	23.7	0.01	65	0.01	65	0	0	0	0	0
12/31/2006	0.008	6.38	0.008	6.38	0.0203	16.2	0.0203	16.2	0.67	541	0.67	541	0	0	0	0	0
1/31/2007	0.016	5.27	0.016	5.27	0.004	13.8	0.004	13.8	0.15	499	0.15	499	0	0	0	0	0
2/28/2007	0.012	3.1	0.012	3.1	0.002	6.32	0.002	6.32	0.13	389	0.13	389	0	0	0	0	0
3/31/2007	0.013	4.72	0.013	4.72	0.001	3.9	0.001	3.9	0.26	789	0.26	789	0	0	0	0	0
4/30/2007	0.001	4.38	0.001	4.38	0.003	11	0.003	11	0.22	879	0.22	879	0	0	0	0	0
5/31/2007	0.001	0.707	0.001	0.707	0.002	8.79	0.002	8.79	0.1	0.182	0.1	0.182	0	0	0	0	0
6/30/2007	0.00358	0.00369	0.00358	0.00369	0.0081	8.3	0.0081	8.3	0.355	**0.004**	0.355	0.004	0	0	0	0	0
7/31/2007	0.001	0.761	0.001	0.761	0.0205	15.6	0.0205	15.6	0.177	**0.000136**	0.177	0.000136	0	0	0	0	0
8/31/2007	0.025	0.3	0.025	0.3	0.0032	38	0.0032	38	0.153	**0.0000018**	0.153	1.8E-06	7.61	16	0.02	0.05	0.05
9/30/2007	0.013	0.247	0.013	0.247	0.01	19.8	0.01	19.8	1.9	37	1.9	37	0	0	0	0	0
10/31/2007	0.001	0.373	0.001	0.373	0.0018	19.8	0.0018	19.8	0.09	28	0.09	28	0	0	0	0	0
11/30/2007	0.015	0.63	0.015	0.63	0.013	5.52	0.013	5.52	1.8	76	1.8	76	7.12	8	0	0.5	0.05
12/31/2007	0.0044	7.88	0.0044	7.88	0.009	16.1	0.009	16.1	5.9	1060	5.9	1060	0	0	0	0	0
1/31/2008	0.0621	9.7	0.0621	9.7	0.0232	3.63	0.0232	3.63	0.0447	6.98	0.0447	6.98	0	0	0	0	0
2/29/2008	0.025	2.74	0.025	2.74	0.013	1.47	0.013	1.47	6.2	689	6.2	689	0	0	0	0	0
3/31/2008	0.026	6.92	0.026	6.92	0.036	9.3	0.036	9.3	3.6	944	3.6	944	0	0	0	0	0
4/30/2008	0.013	5.18	0.013	5.18	0.007	2.85	0.007	2.85	0.259	96.4	0.259	96.4	7.6	0	0	0	0
5/31/2008	0.041	1.57	0.041	1.57	0.013	5.22	0.013	5.22	0.9	344	0.9	344	0	0		0	0
6/30/2008	0.028	3.49	0.028	3.49	0.011	4.85	0.011	4.85	1.1	547	1.1	547	0	0	0	0	0
7/31/2008	0.03	3.22	0.03	3.22	0.036	3.81	0.036	3.81	3.04	318	3.04	318	0	0	0	0	0
8/31/2008	0.041	0.415	0.041	0.415	0.004	4.98	0.004	4.98	1	0.051	1	0.051	7.23	13.5	0.02	7.62	2.29
9/30/2008	0.09	0.607	0.09	0.607	0.067	4.43	0.067	4.43	7.7	51	7.7	51	0	0	0	0	0
10/31/2008	0.002	0.43	0.002	0.43	0.04	9.6	0.04	9.6	0.02	48	0.02	48	0	0	0	0	0
11/30/2008	0.004	0.308	0.004	0.308	0.016	11.9	0.016	11.9	0.06	50	0.06	50	7.2	7	0.02	0.05	0.05
12/31/2008	0.007	4.86	0.007	4.86	0.003	23.7	0.003	23.7	0.9	600	0.9	600	0	0	0	0	0
1/31/2009	0.0003	1.96	0.0003	1.96	0.001	8.04	0.001	8.04	0.073	487	0.073	487	0	0	0	0	0
2/28/2009	0.001	3.77	0.001	3.77	0.002	9.07	0.002	9.07	0.12	438	0.12	438	0	0	0	0	0
3/31/2009	0.002	8.96	0.002	8.96	0.003	11.7	0.003	11.7	0.238	1060	0.238	1060	0	0	0	0	0
4/30/2009	0.001	0.605	0.001	0.605	0.002	4.69	0.002	4.69	0.154	605	0.154	605	0	0	0	0	0
5/31/2009	0.011	4.93	0.011	4.93	0.028	12.56	0.028	12.56	0.12	512	0.12	512					
6/30/2009	0.044	5.18	0.044	5.18	0.01	12	0.01	12	0.031	377	0.031	377	0	0	0	0	0
7/31/2009	0.00009	8.15	0.00009	0.815	0.002	17.2	0.002	17.2	0.013	117	0.013	117					
8/31/2009	0.0005	0.521	0.0005	0.521	0.001	10.2	0.001	10.2	0.005	5.2	0.005	5.2					
9/30/2009	0.018	0.212	0.018	0.212	0.0013	15.7	0.0013	15.7	1.86	22.4	1.86	22.4	7.2	15.5	0.02	0.0828	0.05
10/31/2009	0.02	0.1	0.02	0.1	1.18	7.1	1.18	7.1	3.2	19.2	3.2	19.2					
11/30/2009	0.00005	0.308	0.00005	0.308	0.003	18.8	0.003	18.8	0.013	89.3	0.013	89.3	7.2	6	0	0.05	0.05
12/31/2009	0.00005	0.729	0.00005	0.729	0.0006	9.62	0.0006	9.62	0.006	93.4	0.006	93.4					
1/31/2010	0.0001	0.923	0.0001	0.923	0.003	17.4	0.003	17.4	0.021	142	0.021	142	0	0	0	0	0
2/28/2010	0.003	2.14	0.003	2.14	0.002	11.9	0.002	11.9	0.027	182	0.027	182					
3/31/2010	0.0003	1.77	0.0003	1.77	0.002	9.62	0.002	9.62	0.027	165	0.027	165					
4/30/2010	0.00009	0.428	0.00009	0.428	0.0026	11.7	0.0026	11.7	0.028	127	0.028	127					
5/31/2010	0.0009	3.74	0.0009	3.74	0.0047	19.3	0.0047	19.3	0.01	42.7	0.01	42.7					
6/30/2010	0.0007	3.93	0.0007	3.93	0.003	17.9	0.003	17.9	0.024	136	0.024	136					
7/31/2010	0.00023	2.43	0.00023	2.43	0.0013	14	0.0013	14	0.02	216	0.02	216					
8/31/2010	0.00109	7.22	0.00109	7.22	0.0033	22.4	0.0033	22.4	0.011	73.8	0.011	73.8	7	17	0.05	0.05	0.05
9/30/2010	0.02769	0.1	0.02769	0.1	0.0036	13.1	0.0036	13.1	0.005	20.9	0.005	20.9			0		
10/31/2010	0.00004	0.16	0.00004	0.16	0.002	8.4	0.002	8.4	0.0054	18.8	0.0054	18.8	7.3	8	0.02	0.091	0.05
11/30/2010	0.00017	0.581	0.00017	0.581	0.0055	18.8	0.0055	18.8	0.019	66.9	0.019	66.9	0		0	0	0
12/31/2010	0.00024	0.715	0.00024	0.715	0.0032	9.36	0.0032	9.36	0.038	114	0.038	114					
1/31/2011	0.00312	3.56	0.00312	3.56	0.0099	11.4	0.0099	11.4	0.211	241	0.211	241					
2/28/2011	0.0074	6.47	0.0074	6.47	0.0049	4.32	0.0049	4.32	0.651	570	0.651	570					
3/31/2011	0.006	5.54	0.006	5.54	0.012	10.5	0.012	10.5	0.42	364	0.42	364					
4/30/2011	0.0048	7.68	0.0048	7.68	0.0057	9.1	0.0057	9.1	0.465	744	0.465	744					
5/31/2011	0.000018	0.1	0.000018	0.1	0.00043	0.1	0.00043	0.1	0.112	259	0.112	259					
6/30/2011	0.0025	4.67	0.0025	4.67	0.0046	8.68	0.0046	8.68	0.165	309	0.165	309					
7/31/2011	0.0005	2.09	0.0005	2.09	0.0012	4.69	0.0012	4.69	0.048	177	0.048	177					
Average	0.0	3.6	0.0	3.5	0.1	12.3	0.1	12.3	0.9	371.7	0.9	371.7	1.7	2.5	0.0	0.2	0.1
Minimum	0.000018	0.00369	0.000018	0.00369	0.00043	0.0162	0.00043	0.0162	0.005	0.0000018	0.005	1.8E-06	0	0	0	0	0
Maximum	0.09	13	0.1214	13	2.8	41.2	2.8	41.2	7.7	1240	7.7	1240	7.61	17	0.1	7.62	2.29
Count	82	82	82	82	82	82	82	82	82	82	82	82	47	46	47	47	47
Std Dev	0.0	3.0	0.0	3.0	0.4	8.5	0.4	8.5	1.7	355.0	1.7	355.0	3.1	5.3	0.0	1.3	0.4
CV	1.58	0.84	1.87	0.85	6.36	0.69	6.22	0.69	1.82	0.95	1.82	0.95	1.83	2.10	3.60	7.27	6.64
95th Percentile	0.0	8.9	0.0	8.9	0.1	26.0	0.1	26.0	5.2	1058.5	5.2	1058.5	7.3	15.4	0.0	0.1	0.1
5th Percentile	0.000090	0.103000	0.000090	0.103000	0.001010	3.639000	0.001010	3.639000	0.010000	0.432900	0.010000	0.432900	0.0	0.0	0.0	0.0	0.0

B. Organic and Hydraulic Loading to WWTP



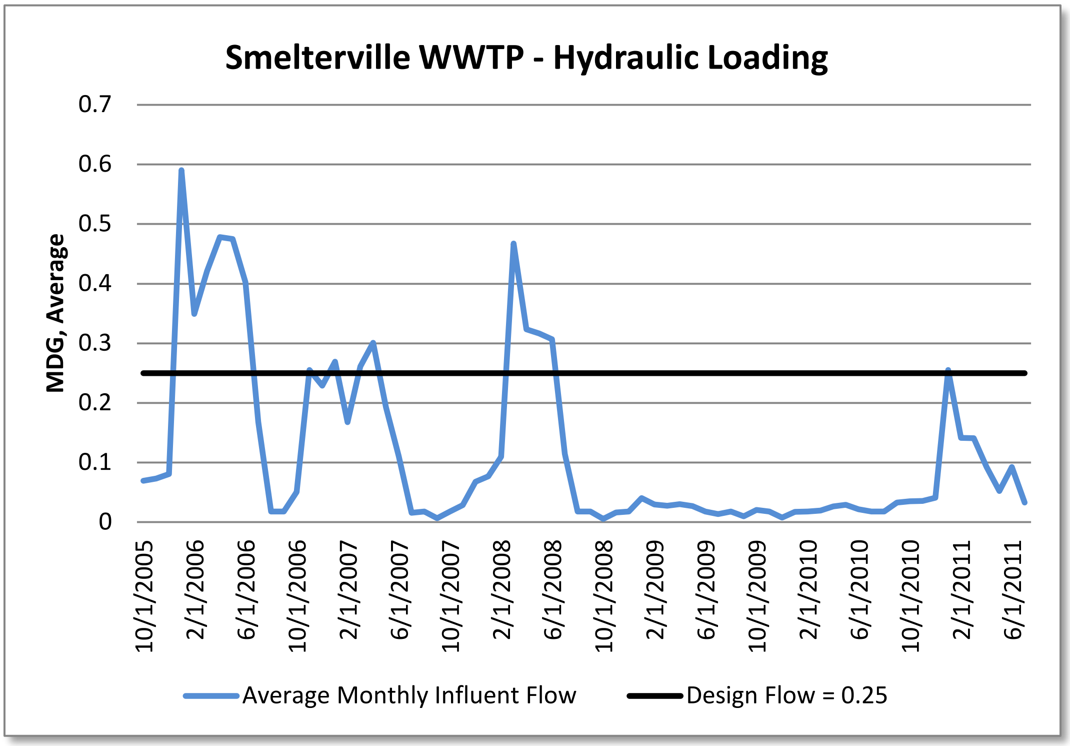
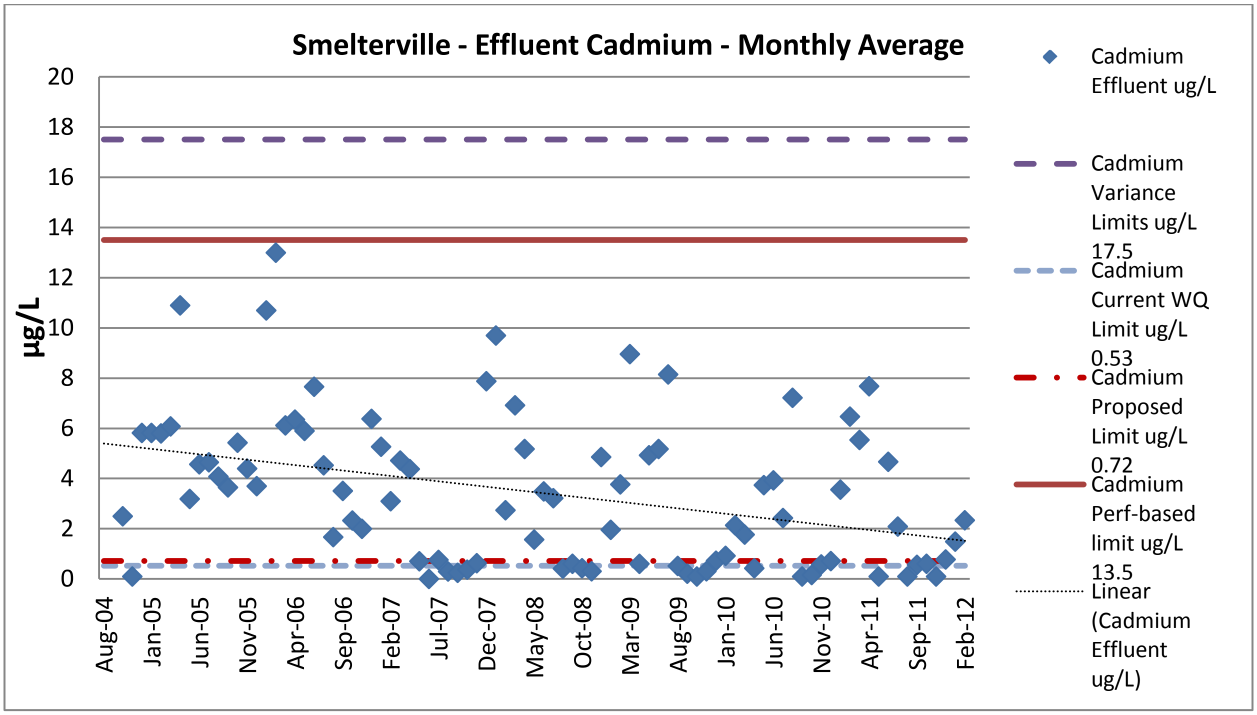
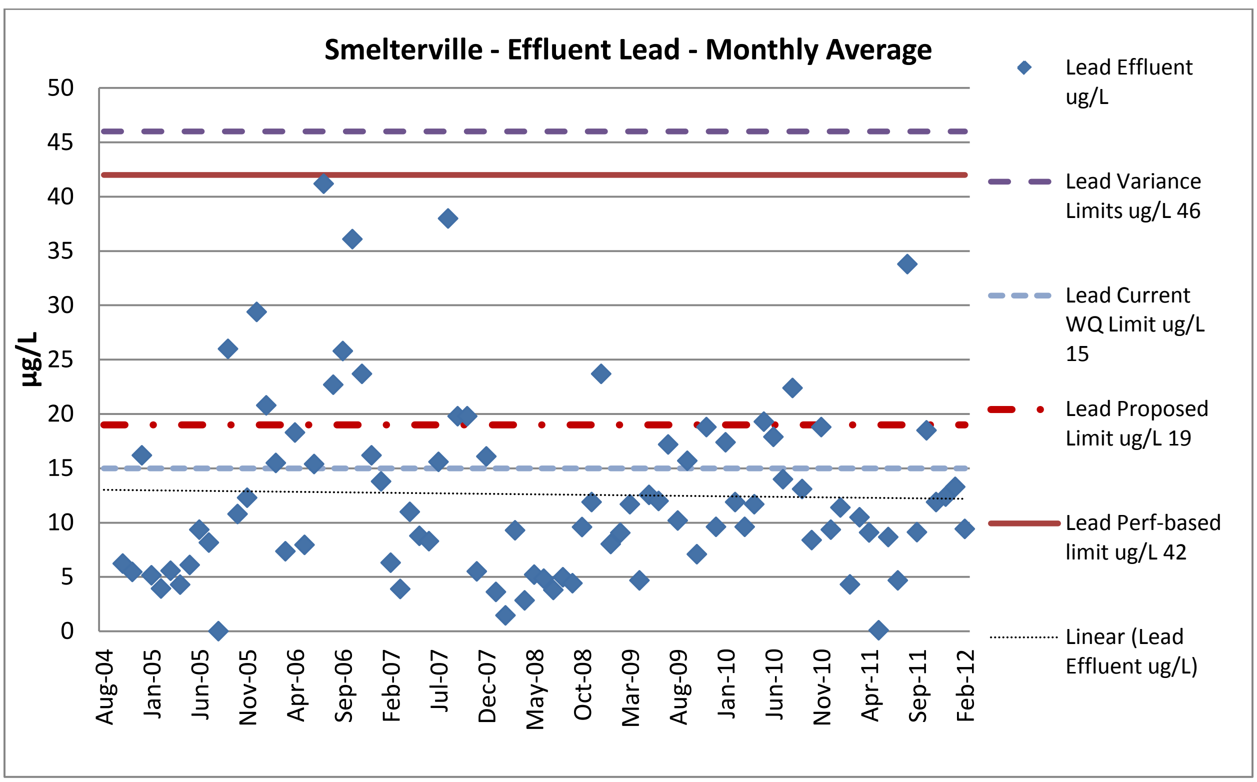


Figure 5. Smelterville WWTP Average Monthly Influent Loading - 2005 to 2011

C. Effluent Metal Concentration

The following graphs are of the metals effluent data as submitted on the DMRs.





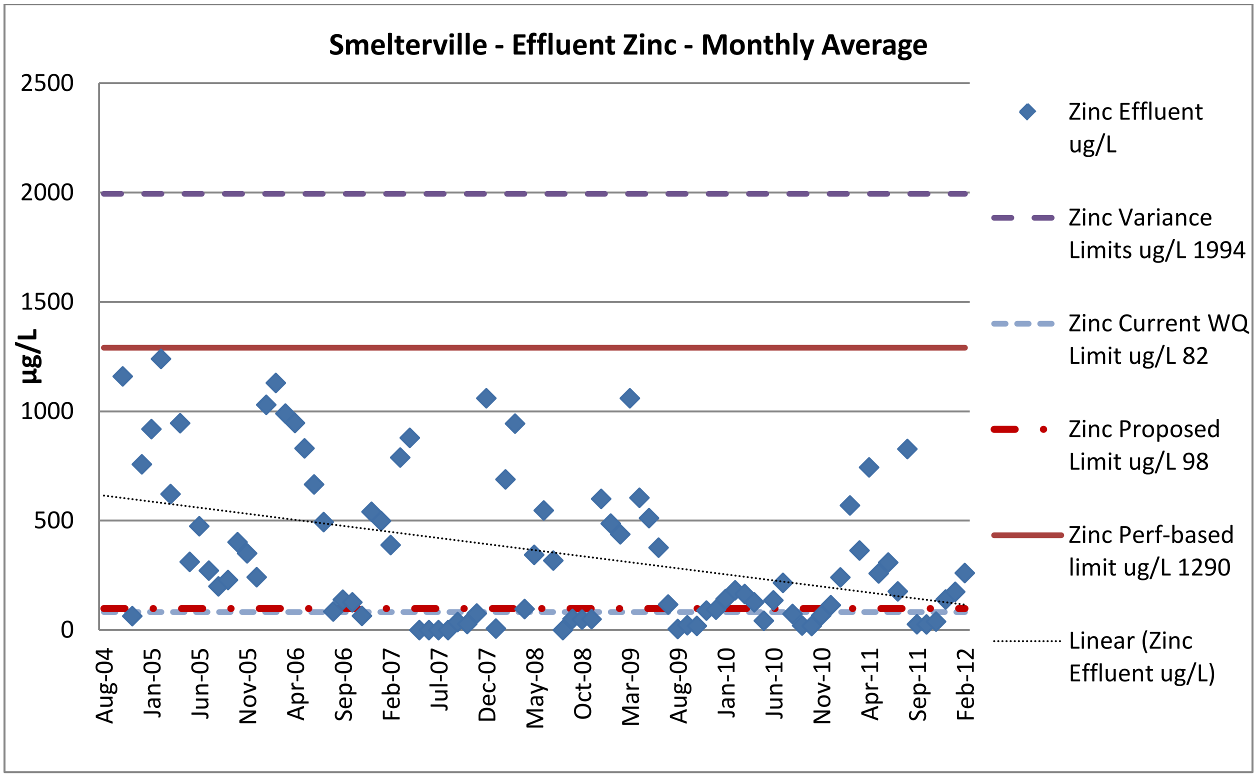


Figure 6. Cadmium, Lead, Zinc Effluent Concentrations

D. Effluent Data from Permit Application

The permit application data provided no additional data than was available in the discharge monitoring report summary, Appendix B.

Since the application was submitted in January 2009, additional data was reported in the monthy DMRs. DMR data as shown in Appendix B was used for evaluating reasonable potential and establishing permit limits. The calculated coefficient of variation (CV) and the 95th percentile was used in the reasonable potential analysis, Appendix D.

Appendix C: River Critical Design Flows

IDAPA 58.01.02.060 allows for mixing zones that utilizes up to 25% of the critical flow volumes. Further, IDAPA 58.01.02.210 requires that numeric standards be evaluated at the following low flow design discharge conditions:

Aquatic Life		Human Health	
CMC ("acute" criteria)	1Q10 or 1B3	Non-carcinogens	30Q5
CCC ("chronic" criteria)	7Q10 or 4B3	Carcinogens Harmonic	mean flow
Ammonia	30B3 or 30Q10		

Idaho's water quality standards suggest applying the following low flow conditions for surface water quality criteria.

1. The 1Q10 flow is used for the protection of aquatic life from acute effects. It represents the lowest one day flow with an average recurrence frequency of once in 10 years.
2. The 7Q10 flow is used for the protection of aquatic life from chronic effects. It represents lowest average 7 consecutive day flow with an average recurrence frequency of once in 10 years.
3. The 30Q10 flow is used for the protection of aquatic life for the chronic ammonia criterion. It represents the lowest average 30 consecutive day flow with an average recurrence frequency of once in 10 years.
4. The 30Q5 flow is used for the protection of human health from non-carcinogens. It represents the lowest average 30 consecutive day flow with an average recurrence frequency of once in 5 years.
5. The harmonic mean flow is a long-term mean flow and is used for the protection of human health from carcinogens. It is the number of daily flow measurements divided by the sum of the reciprocals of the flows.

A. Receiving Water Quantity

The EPA determined critical design flows in the vicinity of the discharge considering stream flow data from the from the following U.S. Geological Survey (USGS) monitoring locations:

1. Upstream Site KELLOGG ID — USGS 12413210 SF COEUR D ALENE AT ELIZABETH PARK NR
Latitude 47° 31'53", Longitude 116° 05'33"

2. Upstream Site — USGS 12413300 SF COEUR D ALENE RIVER AT SMELTERVILLE ID
Latitude 47°32'54", Longitude 116°10'31"

3. Downstream Site: — USGS 12413470 SF COEUR D ALENE RIVER NR PINEHURST ID
Latitude 47°33'07", Longitude 116°14'11"

Figure 7. River Flow Monitoring Stations in the Vicinity of the Outfall

Data from the upstream Smelterville monitoring site was used as the basis for critical flow data for the 2004 permit. Monitoring data for this location spans seven years, from 1966 through 1974. According to the previous fact sheet, the 1Q10 and 7Q10 were set as the lowest flow observed during the time period. The lowest flow during the period was 64 cfs which occurred December 8, 1972. This flow was used for both the 1Q10 and 7Q10 flows as the basis for evaluating reasonable potential and for establishing permit limits. For the proposed permit, the flow data at Smelterville was not considered further because the data is relatively old and of duration too short to establish critical flows.

River flow data from both Pinehurst and Elizabeth Park were evaluated to establish critical rivers flows for the proposed permit. Limited instantaneous river flow data collected between January 8, 2002 and October 16, 2008 at Smelterville were used to establish a correlation between flows at both Elizabeth Park and Pinehurst. Flows at Smelterville were better correlated with flows at Elizabeth Park than with Pinehurst. Therefore, the Elizabeth Park gauge was used to establish critical river flows in the vicinity of the discharge for this permit.

The Elizabeth Park monitoring location has daily flow beginning in 1987 through the present. The following graph shows the average monthly flows during the period from 1987 through 2011. As indicated the low flow period for establishing effluent limitations is July through December.

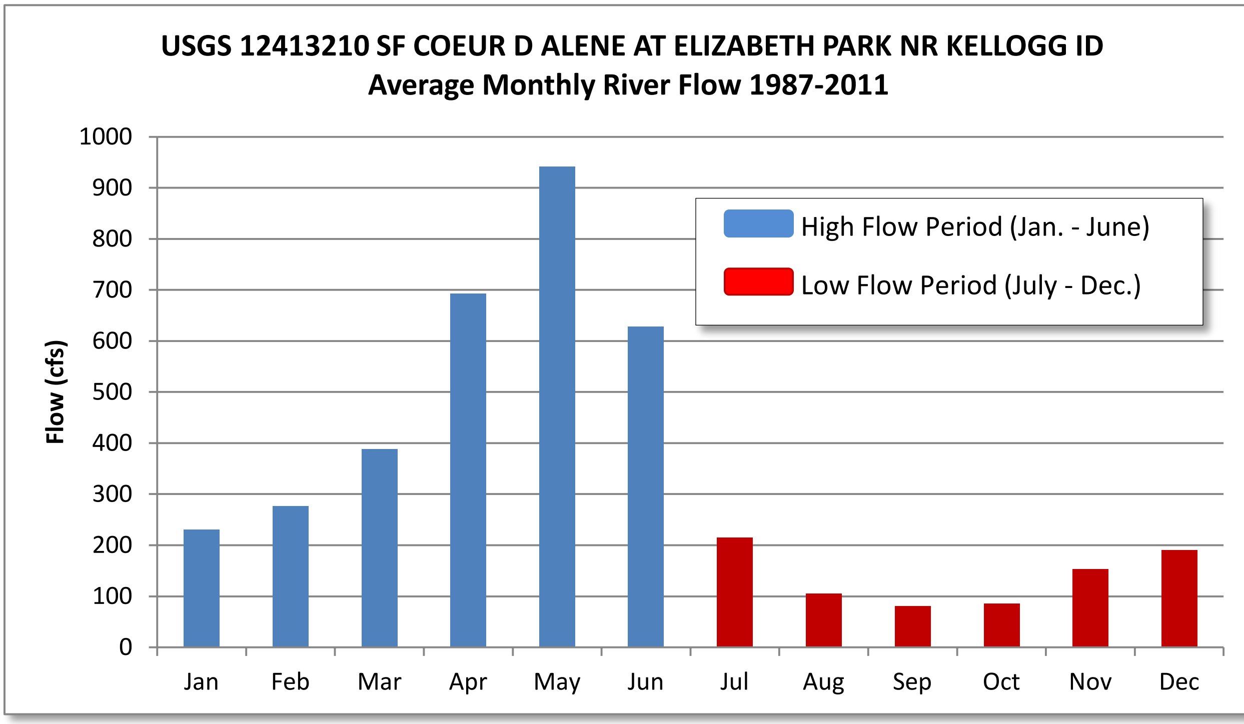


Figure 8. SF Coeur d'Alene River Flow – Seasonal Variation

The following graph shows the critical river flows based on the Elizabeth Park gauge as compared to river and WWTP effluent flows. As shown, both the river flow and WWTP flows have a similar seasonal pattern influenced by wet periods. The WWTP is highly influenced by inflows and infiltration of groundwater into their collection system.

The critical design flows were calculated using the EPA's dFlow[6] program for flows at Elizabeth Park using approximately 24 years of daily flow data.

Table 15. Critical Design Flows – South Fork Coeur d'Alene River at Elizabeth Park

Critical Flow Parameter	Annual Basis	High Flow (January-June)	Low Flow (July-December)
1Q10	40.4	**46.8**	**42.2**
7Q10	51	**58.8**	**52.4**
30Q10	57.1	**71.9**	**56.6**
30Q5	59.3	**91.4**	**61.1**
Harmonic Mean	143	**143**	**141**

A correlation between the daily river flow data at Elizabeth Park and the limited instantaneous flow data at the Smelterville gauge was established using the Excel® workbook based on an established method.[7]

[6] Water Quality Models and Tools – DFLOW (http://water.epa.gov/scitech/datait/models/dflow/index.cfm)

The Smelterville river flow data is presented in Table 20. The following graph shows the river flow at both Elizabeth Park and at Smelterville during the period of time for which overlapping flow data was available. It is followed by a graph of the best fit line for the measured flow at Smelterville as compared to the predicated flow based on the established correction.

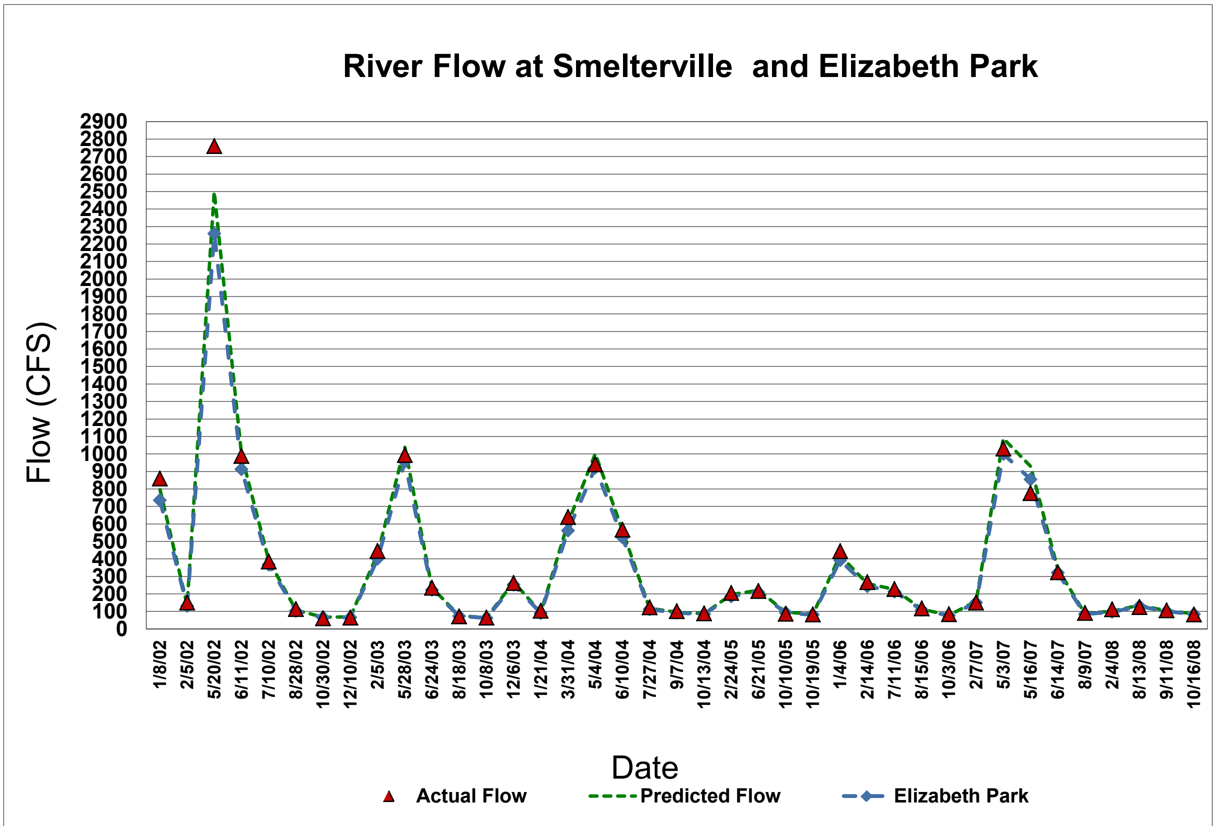


Figure 9. River Flow at Smelterville and Elizabeth Park

[7] Hirsch, R. A Comparison of Four Stream flow Record Extension Techniques. Water Resources Research. Vol. 18, No. 4, Pages 1081-1088. August 1982.

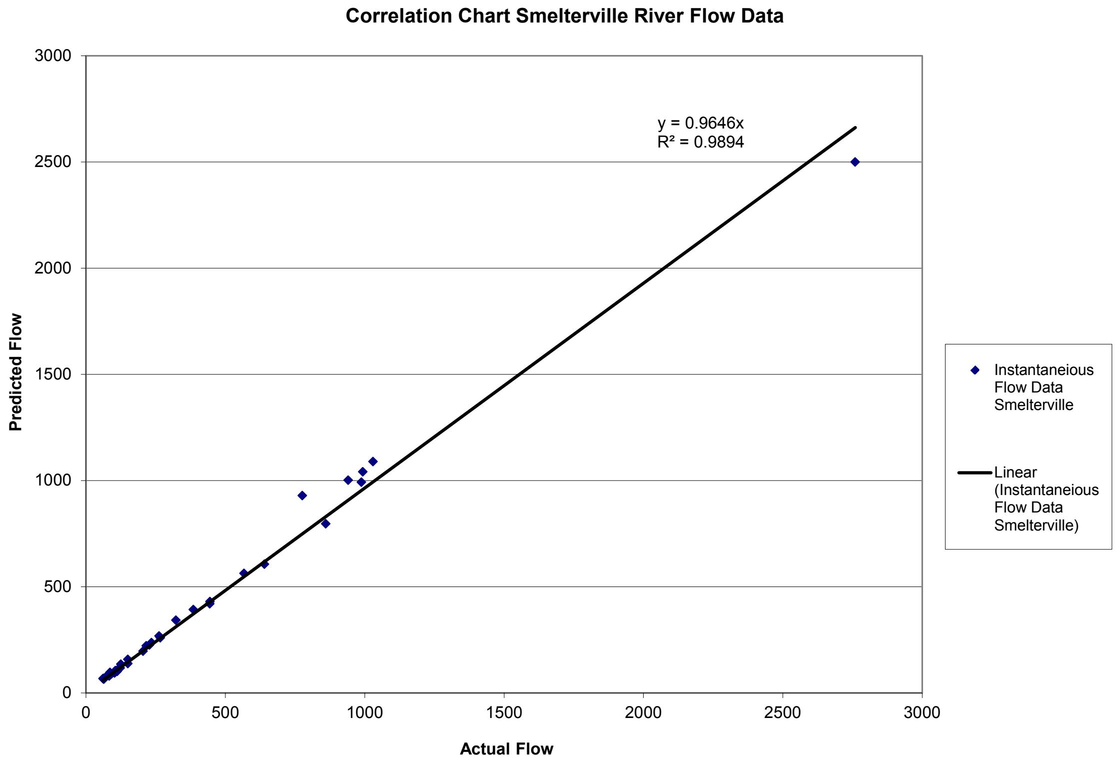


Figure 10. Correlation Chart for Actual vs. Predicated River Flow at Smelterville

The above correlation was used to estimate critical river flows at Smelterville based on the critical river flows at Elizabeth Park, Table 16. These critical river flows will be used to develop water quality-based effluent limits.

Table 16. Critical River Flows at Smelterville

Critical Flow Parameter	Annual Basis	High Flow (January-June)	Low Flow (July-December)
1Q10	41.5	**48.2**	**43.3**
7Q10	52.6	**60.8**	**54.0**
30Q10	59.0	**74.6**	**58.4**
30Q5	61.3	**95.2**	**63.2**
Harmonic Mean	150.2	**150.2**	**148.1**

B. Mixing Zone and Dilution Factors

A mixing zone is an area where an effluent discharge undergoes initial dilution and is extended to cover the secondary mixing in the ambient water body. A mixing zone is an allocated impact zone where the water quality standards may be exceeded as long as acutely toxic conditions are prevented (U.S. EPA

NPDES Permit Writers' Manual, 2010[8]). The federal regulations at 40 CFR 131.13 states that "States may, at their discretion, include in their State standards, policies generally affecting their application and implementation, such as mixing zones, low flows and variances."

The Idaho Water Quality Standards at IDAPA 58.01.02.060 provides Idaho's mixing zone policy for point source discharges. The policy allows the Idaho Department of Environmental Quality (IDEQ) to authorize a mixing zone for a point source discharge after a biological, chemical, and physical appraisal of the receiving water and the proposed discharge.

The following formula is used to calculate a dilution factor based on the allowed mixing.

Dilution Factor $$DF = \frac{Q_d + Q_{critical\ flow} \times (\text{percentage of river allowble for mixing})}{Q_d}$$

Where Q_d = WWTP discharge flow (cfs); $Q_{critical\ flow}$ = applicable critical river flow (cfs)

Dilution factor is calculated based on the design flow.

The City of Smelterville WWTP discharges near the Page WWTP outfall such that the mixing zones overlap. The Smelterville outfall discharges approximately 10 feet upstream of the Page outfall. For the purposes of establishing a dilution factor, these two discharges will be permitted with a single shared mixing zone. Concentrations limits will be set to ensure that the water quality standards are not exceeded at the edge of the shared mixing zone. The mass loading limits will be allocated based on plant flow.

Idaho's water quality standards address allowable mixing zones for adjacent outfalls. This portion of the rule applies to overlapping discharges. Single mixing zones are allowed 25% of the width and volume. The rule is specific with regard to size criteria for adjacent mixing zone, but silent on the river flow criteria. In their draft 401 Certification, the IDEQ proposes to authorize a mixing zone of 50% of the river flow for ammonia and chlorine for the two facilities. The EPA used this mixing zone in its reasonable potential analysis and calcution of water quality-based effluent limits.

Excerpt IDAPA 58.01.02.060

e. Mixing zones in flowing receiving waters are to be limited to the following: (7-1-93)

i. *The cumulative width of adjacent mixing zones when measured across the receiving water is not to exceed fifty percent (50%) of the total width of the receiving water at that point; (7-1-93)*

ii. The width of a mixing zone is not to exceed twenty-five percent (25%) of the stream width or three hundred (300) meters plus the horizontal length of the diffuser as measured perpendicularly to the stream flow, whichever is less; (7-1-93)

iii. The mixing zone is to be no closer to the ten (10) year, seven (7) day low-flow shoreline than fifteen percent (15%) of the stream width; (7-1-93)

iv. The mixing zone is not to include more than twenty-five percent (25%) of the volume of the stream flow; (7-1-9)

[8] http://www.epa.gov/npdes/pubs/pwm_2010.pdf, p. 6-20.

The following combined dilution factors will be used to establish limits for both WWTPs.

Table 17. Dilution Factors – Low Season Critical River Flows – July – December

Plant Data	Units	Design Flow	
Design Flow	mgd	4.55	4.3 MDG Page, 0.25 MGD Smelterville
Design Flow	cfs - calculated	7.0	
BOD_5	lb/day		
TSS	lb/day		

Low Flow (July -December)

Estimated Critical Design Flows USGS 12413300 SF COEUR D ALENE RIVER AT SMELTERVILLE ID

Critical Flow Parameter		Used for evaluating criteria for:
1Q10	43.3	Aquatic Life Uses - Acute
7Q10	54	Aquatic Life Uses - Chronic
30Q10	58.4	Ammonia
30Q5	63.2	Human Health – Non-carninogen
Harmonic Mean	148.1	Human Health – Carcinogen

Calculation of Dilution Factors based on Critical Design Flows and design WWTP Flows

Dilution Factors	Allowable % of river flow	Dilution Factor	Basis	Receiving Water Concentration (RCW)
DF-edge of Acute zone	50%	4.1	1Q10	
DF-edge of Chronic zone	50%	4.8	7Q10	34%
Ammonia	50%	5.1	30Q10	
HH-Non-Carcinogen	50%	5.5	30Q5	
HH-Carcinogen	50%	11.5	Harmonic Mean	

Table 18. Dilution Factors – High Season Critical River Flows – January – June

High Flow (January-June)

Estimated Critical Design Flows USGS 12413300 SF COEUR D ALENE RIVER AT SMELTERVILLE ID

Critical Flow Parameter		Used for evaluating criteria for:
1Q10	48.2	Aquatic Life Uses - Acute
7Q10	60.8	Aquatic Life Uses - Chronic
30Q10	74.6	Ammonia
30Q5	95.2	Human Health – Non-carninogen
Harmonic Mean	150.2	Human Health – Carcinogen

Calculation of Dilution Factors based on Critical Design Flows and design WWTP Flows

Dilution Factors	Allowable % of river flow	Dilution Factor	Basis	Receiving Water Concentration (RCW)
DF-edge of Acute zone	50%	4.4	1Q10	
DF-edge of Chronic zone	50%	5.3	7Q10	32%
Ammonia	50%	6.3	30Q10	
HH-Non-Carcinogen	50%	7.8	30Q5	
HH-Carcinogen	50%	11.7	Harmonic Mean	

Table 19. Dilution Factors Yearly Critical River Flows

Annual Flows (April - March)

Estimated Critical Design Flows USGS 12413300 SF COEUR D ALENE RIVER AT SMELTERVILLE ID

Critical Flow Parameter		Used for evaluating criteria for:
1Q10	41.5	**Aquatic Life Uses - Acute**
7Q10	52.6	**Aquatic Life Uses - Chronic**
30B3	59	**Ammonia**
30Q5	61.3	**Human Health – Non-carninogen**
Harmonic Mean	150.2	**Human Health – Carcinogen**

Calculation of Dilution Factors based on Critical Design Flows and design WWTP Flows

Dilution Factors	Allowable % of river flow	Dilution Factor	Basis	Receiving Water Concentration (RCW)
DF-edge of Acute zone	**50%**	**3.9**	**1Q10**	
DF-edge of Chronic zone	**50%**	**4.7**	**7Q10**	**35%**
Ammonia	**50%**	**5.2**	**30B3**	
HH-Non-Carcinogen	**50%**	**5.4**	**30Q5**	
HH-Carcinogen	**50%**	**11.7**	**Harmonic Mean**	

C. Receiving Water Quality

Receiving water quality is used to evaluate the overall impact of the discharge on receiving water. Both USGS monitoring sites included some receiving water data. Where pollutant data were available, data provided by the South Fork Coeur d'Alene Sewer District at a sample point upstream of the discharge was used to characterize the receiving water upstream of the point of discharge. The tables below summarize the receiving water data used to evaluate the reasonable potential of the discharge to contribute to violations of the WQS.

Table 20: Receiving Water Quality USGS Smelterville Gauge (2002 to Present)

Statistical Data	Temperature, water, degrees Celsius	pH, water, unfiltered, field, standard units	Ammonia, water, filtered, milligrams per liter as nitrogen	Nitrate plus nitrite, water, filtered, milligrams per liter as nitrogen	Phosphorus, water, unfiltered, milligrams per liter as phosphorus	Phosphorus, water, filtered, milligrams per liter as phosphorus	Hardness, water, milligrams per liter as calcium carbonate	Cadmium, water, filtered, micrograms per liter	Cadmium, water, unfiltered, micrograms per liter	Lead, water, filtered, micrograms per liter	Lead, water, unfiltered, recoverable, micrograms per liter	Zinc, water, filtered, micrograms per liter	Zinc, water, unfiltered, recoverable, micrograms per liter
1/21/2004	4	7.1	0.016	0.214	0.027	0.013	182	13.3	13.1	3.34	8.88	1470	1500
3/31/2004	6.2	7.4	< 0.010	0.075	0.018	0.005	46.2	4.72	5.32	4.88	44.8	713	795
5/4/2004	8.8	7.3	< 0.010	0.029	0.012	E 0.003	29.9	2.44	2.81	2.56	38.1	394	415
6/10/2004	9.1	7.3	< 0.010	0.049	0.011	0.005	43.4	4.09	4.08	3.33	8.97	620	583
7/27/2004	17.4	7.5	< 0.010	0.058	0.021	0.013	91.7	7.66	7.49	5.83	9.43	1110	1040
9/7/2004	14.3	7.4	E 0.006	0.074	0.023	0.012	87.7	9.13	9.28	4.78	10.2	1200	1180
10/13/2004	9.3	7.2	E 0.005	0.116	0.027	0.01	122	10.4	10.3	3.58	10	1230	1260
12/12/2004	3.4	6.7	< 0.010	0.12	0.022	0.007	35.5	4.38	5	1.89	45.5	519	575
2/24/2005	4.2	6.9	E 0.006	0.127	0.014	0.01	80.1	5.76	5.92	3.43	6.88	886	905
3/29/2005	4.2	7.3	E 0.005	0.123	0.016	0.005	47.5	6.59	6.09	2.19	16.9	670	687
5/17/2005	7.7	7.7	E 0.005	0.037	0.013	0.011	40.7	2.75	3.16	2.41	15.1	486	429
6/21/2005	14.8	7.5	E 0.007	0.064	0.019	0.011	77.4	6.38	6.28	3.75	8.43	885	826
8/10/2005	18.4	7.6	E 0.005	0.056	0.034	0.011	100	7.54	7.9	5.06	13.9	856	936
10/19/2005	9.3	7.3	E 0.006	0.11	0.022	0.013	108	9.58	9.39	3.42	7.95	1320	1350
1/4/2006	5.1	7.3	E 0.007	0.19	0.013	0.009	73	9.54	9.54	2.77	9.87	995	1100
2/14/2006	3.4	7.2	< 0.010	0.036	< 0.004	E 0.003	90.6	8.82	8.6	2.86	7.72	1260	1210
4/6/2006	5.5	7.2	E 0.006	0.083	0.055	0.006	46.1	4.24	5.86	2.33	107	685	752
5/17/2006	10.9	7.4	< 0.010	0.028	0.087	0.005	23.3	1.6	5.07	3.77	279	240	615
6/13/2006	11.6	6.8	E 0.007	< 0.016	0.01	0.006	44.6	3.33	3.35	2.74	9.18	490	478
7/11/2006	19.3	6.9	E 0.005	0.022	0.018	0.01	79.8	5.83	6.01	4.58	10.2	846	768
8/15/2006	16.2	6.8	0.014	0.07	0.026	0.015	109	7.5	8.05	3.84	7.97	1140	1160
10/3/2006	12.1	7.8	< 0.020	0.075	0.026	0.015	126	7.9	8.33	4.49	8.95	1120	1150
11/8/2006	7.3	7.1	< 0.020	0.144	0.02	E 0.007	43.4	5.49	5.7	2.76	23.6	787	786
2/7/2007	3.8	7.3	E 0.011	0.121	0.02	0.013	89.5	7.59	6.67	3.97	7.5	1130	989
3/12/2007	5.7	7.1	< 0.020	0.117	0.183	E 0.007	175	3.24	7.76	1.13	282	431	881
5/3/2007	5.7	7.5	< 0.020	0.033	0.012	E 0.005	32.6	2.28	2.34	2.34	19	360	360
6/14/2007	9.6	7.1	< 0.020	0.052	0.013	E 0.007	112	4.28	3.94	3.31	6.69	671	597
8/9/2007	17	7.1	< 0.020	0.089	0.027	0.014	95.7	7.84	7.13	4.39	9.34	1180	1040
10/16/2007	9.6	7.4	E 0.015	0.144	0.028	0.017	125	9.33	8.7	5.67	16	1410	1240
12/4/2007	4	7.3	E 0.014	0.26	0.05	E 0.007	59.6	9.27	11.1	1.57	72.3	938	1030
2/4/2008	2.8	7.3	E 0.015	0.285	0.022	0.019	118	8.6	8.45	3.71	6.31	1240	1140
5/6/2008	7.7	7.2	< 0.020	0.086	0.049	E 0.005	38.1	3.04	5.02	2.24	166	515	661
5/18/2008	6	7	< 0.020	0.061	0.31	E 0.007	21.8	1.22	11.5	6.18	1960	217	1820
6/25/2008	10.8	7.5	< 0.020	0.021	0.01	E 0.005	32.6	2.71	2.99	4.94	25.5	407	408
8/13/2008	16	7.4	< 0.020	0.113	0.025	0.017	120	8.81	8.15	7.22	11.6	1180	1110
9/11/2008	14.1	7.5	E 0.018	0.149	0.03	0.021	126	11.3	10.3	6.92	12.4	1440	1350
10/16/2008	6.8	7.3	< 0.020	0.197	0.032	0.021	103	11.6	11	5.44	10.7	1670	1480
11/13/2008	6.8	7.2	< 0.020	0.177	0.082	0.01	65.9	5.69	7.96	4.25	151	848	1000
1/8/2009	2.1	6.7	0.02	0.148	0.142	0.01	35.2	3.52	6.89	1.81	256	399	665
2/24/2009	3.2	6.5	E 0.011	0.243	0.038	0.015	78.2	8.34	7.91	2.82	20.1	1040	974
5/19/2009	6.2	6.6	< 0.020	0.043	0.065	E 0.005	25.7	1.99	3.8	3.61	259	332	511
6/17/2009	11.5	7.1	< 0.020	0.033	0.013	0.009	43.2	3.89	3.89	4.82	10.6	573	521
8/4/2009	19.8	7.6	< 0.020	0.108	0.029	0.016	104	8.04	8.06	4.45	9.87	966	947
10/20/2009	9.7	7.2	E 0.010	0.092	0.058	0.023	154	12.2	11.3	4.11	16.2	1540	1420
3/30/2010	4.7	7.3	< 0.020	0.199	0.03	0.01	50.3	5.54	5.76	2.15	46.1	653	629
4/21/2010	7.6	6.9	< 0.020	0.082	0.042	E 0.007	32.8	3.11	4.04	1.97	98.9	467	529
7/8/2010	12.8	7.5	< 0.020	0.079	0.017	0.011	64.1	6.44	5.74	3.71	8.02	982	815
10/6/2010	13.7	7.5	< 0.010	0.1	0.045	0.015	112	10.1	10.3	2.67	11.7	1320	1260
1/15/2011	4.3	7.5	< 0.010	0.153	0.021	0.009	44.6	4.25	4.41	1.72	21.1	573	484
6/7/2011	6.8	6.4	< 0.010	0.026	0.164	0.007	27.3	2.07	74.2	1.78	351	295	4900
7/12/2011	12.3	7.4	< 0.010	0.012	0.019	0.007	45.2	3.42	8.58	3.44	24.4	440	726
Count	51	51	3	50	50	39	51	51	51	51	51	51	51
Min	2.1	6.4	0.014	0.012	0.01	0.005	21.8	1.22	2.34	1.13	6.31	217	360
Max	19.8	7.8	0.02	0.285	0.31	0.023	182	13.3	74.2	7.22	1960	1670	4900
Ave	9.09	7.22	0.02	0.10	0.04	0.01	75.67	6.25	8.32	3.59	90.15	845.86	980.14
Std. Dev.	4.81	0.31	0.00	0.07	0.05	0.00	40.64	3.10	9.76	1.40	280.40	383.99	652.48
CV	0.53	0.04	0.18	0.64	1.26	0.40	0.54	0.50	1.17	0.39	3.11	0.45	0.67
95th Percentile	**17.90**	**7.60**	0.0196	0.22995	0.1541	0.021	140	11.45	11.4	6.005	280.5	1455	1490
5 Percentile	3.3	6.65	0.0142	0.0238	0.01145	0.005	**27**	2.03	3.075	1.75	7.19	313.5	422

Receiving Water Quality USGS Smelterville Gauge (2002 to Present) – High Flow

Statistical Data	Temperature, water, degrees Celsius	pH, water, unfiltered, field, standard units	Ammonia, water, filtered, milligrams per liter as nitrogen	Nitrate plus nitrite, water, filtered, milligrams per liter as nitrogen	Phosphorus, water, unfiltered, milligrams per liter as phosphorus	Phosphorus, water, filtered, milligrams per liter as phosphorus	Hardness, water, milligrams per liter as calcium carbonate	Cadmium, water, filtered, micrograms per liter	Cadmium, water, unfiltered, micrograms per liter	Lead, water, filtered, micrograms per liter	Lead, water, unfiltered, recoverable, micrograms per liter	Zinc, water, filtered, micrograms per liter	Zinc, water, unfiltered, recoverable, micrograms per liter
1/21/2004	4	7.1	0.016	0.214	0.027	0.013	182	13.3	13.1	3.34	8.88	1470	1500
3/31/2004	6.2	7.4	< 0.010	0.075	0.018	0.005	46.2	4.72	5.32	4.88	44.8	713	795
5/4/2004	8.8	7.3	< 0.010	0.029	0.012	E 0.003	29.9	2.44	2.81	2.56	38.1	394	415
12/12/2004	3.4	6.7	< 0.010	0.12	0.022	0.007	35.5	4.38	5	1.89	45.5	519	575
2/24/2005	4.2	6.9	E 0.006	0.127	0.014	0.01	80.1	5.76	5.92	3.43	6.88	886	905
3/29/2005	4.2	7.3	E 0.005	0.123	0.016	0.005	47.5	6.59	6.09	2.19	16.9	670	687
5/17/2005	7.7	7.7	E 0.005	0.037	0.013	0.011	40.7	2.75	3.16	2.41	15.1	486	429
1/4/2006	5.1	7.3	E 0.007	0.19	0.013	0.009	73	9.54	9.54	2.77	9.87	995	1100
2/14/2006	3.4	7.2	< 0.010	0.036	< 0.004	E 0.003	90.6	8.82	8.6	2.86	7.72	1260	1210
4/6/2006	5.5	7.2	E 0.006	0.083	0.055	0.006	46.1	4.24	5.86	2.33	107	685	752
5/17/2006	10.9	7.4	< 0.010	0.028	0.087	0.005	23.3	1.6	5.07	3.77	279	240	615
2/7/2007	3.8	7.3	E 0.011	0.121	0.02	0.013	89.5	7.59	6.67	3.97	7.5	1130	989
3/12/2007	5.7	7.1	< 0.020	0.117	0.183	E 0.007	175	3.24	7.76	1.13	282	431	881
5/3/2007	5.7	7.5	< 0.020	0.033	0.012	E 0.005	32.6	2.28	2.34	2.34	19	360	360
12/4/2007	4	7.3	E 0.014	0.26	0.05	E 0.007	59.6	9.27	11.1	1.57	72.3	938	1030
2/4/2008	2.8	7.3	E 0.015	0.285	0.022	0.019	118	8.6	8.45	3.71	6.31	1240	1140
5/6/2008	7.7	7.2	< 0.020	0.086	0.049	E 0.005	38.1	3.04	5.02	2.24	166	515	661
5/18/2008	6	7	< 0.020	0.061	0.31	E 0.007	21.8	1.22	11.5	6.18	1960	217	1820
1/8/2009	2.1	6.7	0.02	0.148	0.142	0.01	35.2	3.52	6.89	1.81	256	399	665
2/24/2009	3.2	6.5	E 0.011	0.243	0.038	0.015	78.2	8.34	7.91	2.82	20.1	1040	974
5/19/2009	6.2	6.6	< 0.020	0.043	0.065	E 0.005	25.7	1.99	3.8	3.61	259	332	511
3/30/2010	4.7	7.3	< 0.020	0.199	0.03	0.01	50.3	5.54	5.76	2.15	46.1	653	629
4/21/2010	7.6	6.9	< 0.020	0.082	0.042	E 0.007	32.8	3.11	4.04	1.97	98.9	467	529
1/15/2011	4.3	7.5	< 0.010	0.153	0.021	0.009	44.6	4.25	4.41	1.72	21.1	573	484
Count	24	24	2	24	23	15	24	24	24	24	24	24	24
Min	2.1	6.5	0.016	0.028	0.012	0.005	21.8	1.22	2.34	1.13	6.31	217	360
Max	10.9	7.7	0.02	0.285	0.31	0.019	182	13.3	13.1	6.18	1960	1470	1820
Ave	5.30	7.15	0.02	0.12	0.05	0.01	62.35	5.26	6.51	2.82	158.09	692.21	819.00
Std. Dev.	2.09	0.30	0.00	0.08	0.07	0.00	43.42	3.12	2.80	1.14	395.38	349.82	357.22
CV	0.39	0.04	0.16	0.64	1.28	0.41	0.70	0.59	0.43	0.40	2.50	0.51	0.44
95th Percentile	**8.64**	**7.50**	**0.0198**	**0.25745**	**0.1789**	**0.0162**	166.45	**9.4995**	**11.44**	**4.7435**	**281.55**	**1257**	**1456.5**
5 Percentile	2.86	6.615	0.0162	0.0296	0.0121	0.005	**23.66**	1.6585	2.8625	1.5925	6.973	253.8	417.1

Receiving Water Quality USGS Smelterville Gauge (2002 to Present) – Low Flow

Statistical Data	Temperature, water, degrees Celsius	pH, water, unfiltered, field, standard units	Ammonia, water, filtered, milligrams per liter as nitrogen	Nitrate plus nitrite, water, filtered, milligrams per liter as nitrogen	Phosphorus, water, unfiltered, milligrams per liter as phosphorus	Phosphorus, water, filtered, milligrams per liter as phosphorus	Hardness, water, milligrams per liter as calcium carbonate	Cadmium, water, filtered, micrograms per liter	Cadmium, water, unfiltered, micrograms per liter	Lead, water, filtered, micrograms per liter	Lead, water, unfiltered, recoverable, micrograms per liter	Zinc, water, filtered, micrograms per liter	Zinc, water, unfiltered, recoverable, micrograms per liter
6/10/2004	9.1	7.3	< 0.010	0.049	0.011	0.005	43.4	4.09	4.08	3.33	8.97	620	583
7/27/2004	17.4	7.5	< 0.010	0.058	0.021	0.013	91.7	7.66	7.49	5.83	9.43	1110	1040
9/7/2004	14.3	7.4	E 0.006	0.074	0.023	0.012	87.7	9.13	9.28	4.78	10.2	1200	1180
10/13/2004	9.3	7.2	E 0.005	0.116	0.027	0.01	122	10.4	10.3	3.58	10	1230	1260
6/21/2005	14.8	7.5	E 0.007	0.064	0.019	0.011	77.4	6.38	6.28	3.75	8.43	885	826
8/10/2005	18.4	7.6	E 0.005	0.056	0.034	0.011	100	7.54	7.9	5.06	13.9	856	936
10/19/2005	9.3	7.3	E 0.006	0.11	0.022	0.013	108	9.58	9.39	3.42	7.95	1320	1350
6/13/2006	11.6	6.8	E 0.007	< 0.016	0.01	0.006	44.6	3.33	3.35	2.74	9.18	490	478
7/11/2006	19.3	6.9	E 0.005	0.022	0.018	0.01	79.8	5.83	6.01	4.58	10.2	846	768
8/15/2006	16.2	6.8	0.014	0.07	0.026	0.015	109	7.5	8.05	3.84	7.97	1140	1160
10/3/2006	12.1	7.8	< 0.020	0.075	0.026	0.015	126	7.9	8.33	4.49	8.95	1120	1150
11/8/2006	7.3	7.1	< 0.020	0.144	0.02	E 0.007	43.4	5.49	5.7	2.76	23.6	787	786
6/14/2007	9.6	7.1	< 0.020	0.052	0.013	E 0.007	112	4.28	3.94	3.31	6.69	671	597
8/9/2007	17	7.1	< 0.020	0.089	0.027	0.014	95.7	7.84	7.13	4.39	9.34	1180	1040
10/16/2007	9.6	7.4	E 0.015	0.144	0.028	0.017	125	9.33	8.7	5.67	16	1410	1240
6/25/2008	10.8	7.5	< 0.020	0.021	0.01	E 0.005	32.6	2.71	2.99	4.94	25.5	407	408
8/13/2008	16	7.4	< 0.020	0.113	0.025	0.017	120	8.81	8.15	7.22	11.6	1180	1110
9/11/2008	14.1	7.5	E 0.018	0.149	0.03	0.021	126	11.3	10.3	6.92	12.4	1440	1350
10/16/2008	6.8	7.3	< 0.020	0.197	0.032	0.021	103	11.6	11	5.44	10.7	1670	1480
11/13/2008	6.8	7.2	< 0.020	0.177	0.082	0.01	65.9	5.69	7.96	4.25	151	848	1000
6/17/2009	11.5	7.1	< 0.020	0.033	0.013	0.009	43.2	3.89	3.89	4.82	10.6	573	521
8/4/2009	19.8	7.6	< 0.020	0.108	0.029	0.016	104	8.04	8.06	4.45	9.87	966	947
10/20/2009	9.7	7.2	E 0.010	0.092	0.058	0.023	154	12.2	11.3	4.11	16.2	1540	1420
7/8/2010	12.8	7.5	< 0.020	0.079	0.017	0.011	64.1	6.44	5.74	3.71	8.02	982	815
10/6/2010	13.7	7.5	< 0.010	0.1	0.045	0.015	112	10.1	10.3	2.67	11.7	1320	1260
6/7/2011	6.8	6.4	< 0.010	0.026	0.164	0.007	27.3	2.07	74.2	1.78	351	295	4900
7/12/2011	12.3	7.4	< 0.010	0.012	0.019	0.007	45.2	3.42	8.58	3.44	24.4	440	726
Count	27	27	1	26	27	24	27	27	27	27	27	27	27
Min	6.8	6.4	0.014	0.012	0.01	0.005	27.3	2.07	2.99	1.78	6.69	295	408
Max	19.8	7.8	0.014	0.197	0.164	0.023	154	12.2	74.2	7.22	351	1670	4900
Ave	12.46	7.27	0.01	0.09	0.03	0.01	87.52	7.13	9.94	4.27	29.77	982.44	1123.37
Std. Dev.	3.94	0.30	#DIV/0!	0.05	0.03	0.00	34.63	2.85	13.06	1.26	69.72	366.24	812.74
CV	0.32	0.04	#DIV/0!	0.57	0.97	0.37	0.40	0.40	1.31	0.29	2.34	0.37	0.72
95th Percentile	**19.03**	**7.60**	**0.01**	**0.17**	**0.07**	**0.02**	126.00	**11.51**	**11.21**	**6.59**	**113.35**	**1510.00**	**1462.00**
5 Percentile	6.8	6.8	0.014	0.02125	0.0103	0.00615	**35.8**	2.896	3.512	2.691	7.956	416.9	490.9

Appendix D: 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 for BOD_5, TSS and pH

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. The 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 below.

Table 21. Secondary Treatment Effluent Limits (40 CFR § 133.102)

Parameter	Average Monthly Limit	Average Weekly Limit	Range
Biochemical Oxygen Demand (BOD_5)	30 mg/L	45 mg/L	---
Total Suspended Solids (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 Smelterville WWTP uses chlorine disinfection. 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.

EPA has determined that the technology-based effluent limit for chlorine is not sufficiently stringent to meet water quality standards. Refer to discussion on water quality-based effluent limits below.

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[9]

Following are the mass-based effluent limits for the technology-based effluent limits for BOD_5 and TSS.

Table 22. Mass-Based Effluent for BOD_5 and TSS

Parameter	Average Monthly Limit (lb/day)	Average Weekly Limit (lb/day)
Biochemical Oxygen Demand (BOD_5)	45 mg/L x 0.25 mdg x 8.34 = 93.8 Round to 94	65 mg/L x 0.25 mgd x 8.34 = 136.5 Round to 136
Total Suspended Solids (TSS)	45 mg/L x 0.25 mdg x 8.34 = 93.8 Round to 94	65 mg/L x 0.25 mgd x 8.34 = 136.5 Round to 136

The water quality-based limits for TSS established by the TMDL are more stringent than the technology-based limits above. The permit uses the more stringent limit established by the TMDL as discussed in the next sections.

D. Water Quality-Based Effluent Limitations (WQBELs)

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 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, 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.

[9] 8.34 is a conversion factor with units (lb ×L)/(mg × gallon×10^6)

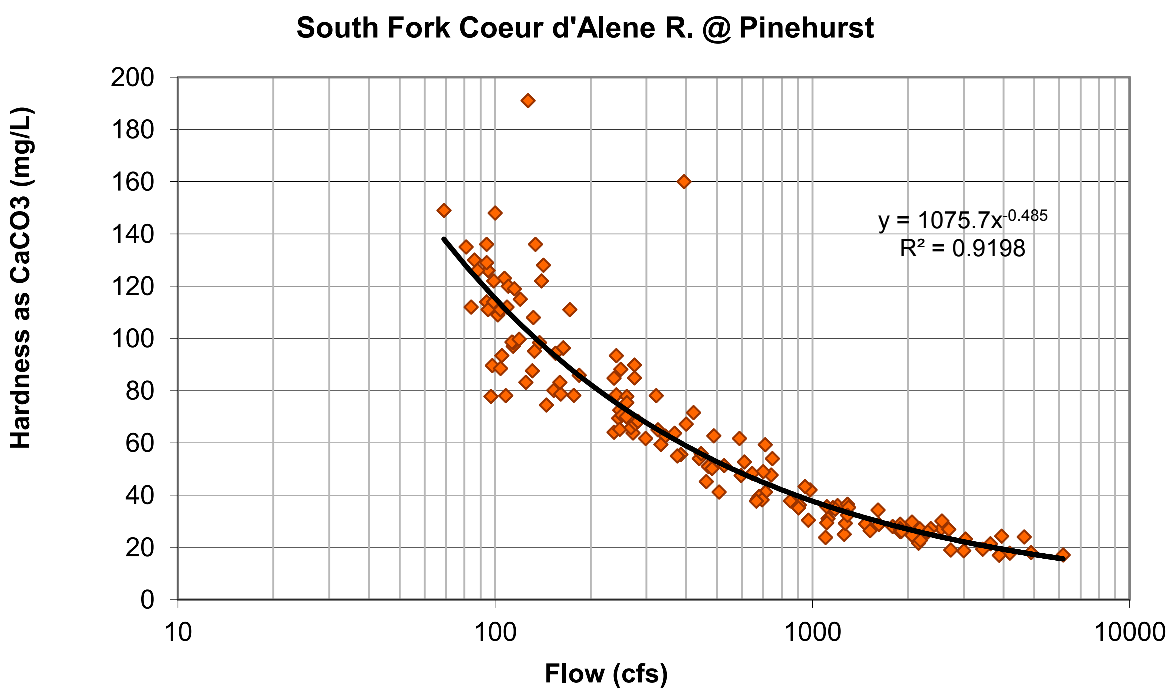
C. Applicable Water Quality Standards (or Criteria)

Hardness-Dependent Metals and Toxics

The toxicities of some metals vary with the hardness of the water. Therefore, the water quality criteria for these metals also vary with hardness. Typically, the EPA uses the hardness of the receiving water when mixed with the effluent to determine the water quality criteria for such metals. Since toxicity decreases (and numeric water quality criteria increase) as hardness increases, EPA has used the 5th percentile as a worst-case assumption for effluent and ambient hardness.

Per Idaho's Water Quality Standards at IDAPA 58.01.02.210.03.c.ii: "The hardness values used for calculating aquatic life criteria for metals at design discharge conditions shall be representative of the ambient hardnesses for a receiving water that occur at the design discharge conditions given in Subsection 210.03.b." The reference to 210.03.b provides the 1Q10/1B3 and 7Q10/4B3 design conditions for aquatic life criteria.

Significant data was analyzed to evaluate appropriate receiving water hardness to use for the South Fork Coeur d'Alene permits. River flow and receiving water hardness are strongly correlated as show below. For river flows less than 100 cfs (7Q10 is 52 cfs), the 5th percentile hardness is 88 mg/L $CaCO_3$ based on hardness data from 1989 through 2011 for the Pinehurt gauge. Similarly, for river flows less than 100 cfs at the Smelterville gauge, the 5th percentile for the hardness data is 93 mg/L $CaCO_3$ based on data from 2002 through 2011. A conservative hardness of 80 mg/L $CaCO_3$ will be used to calculate hardness dependent metals criteria for calculation the WQBELs in the permit.



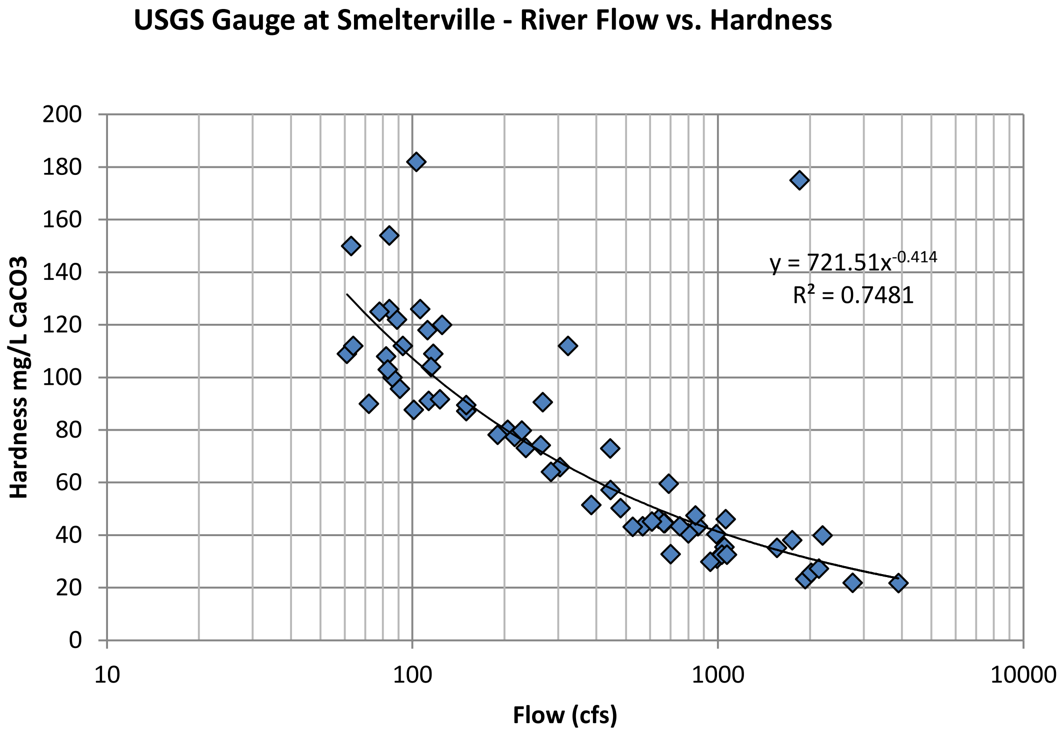


Figure 11. South Fork Coeur d'Alene R. Hardness

Additional data analysis calculated the metals criteria and assimilative capacity for Cadmium, Lead and Zinc as a function of river flow. In all cases, the assimilative capacity is greater at low flows than would be predicted based on flow variation alone because of the relatively higher receiving water hardness at low flows.

The following graphs show the Cadmium, Lead and Zinc criteria as a function of flow, and the assimilative capacity for Cadmium, Lead and Zinc at both the minimum hardness (17 mg/L $CaCO_3$ at Pinehurst) and the actual receiving water hardness at a given river flow. These graphs show that the assimilative capacity at actual river flow and hardness is always greater than the assimilative capacity at actual river flow and assumed low hardness. This indicates that using the minimum or the 5th percentile hardness value to calculate applicable metals criteria would be overly conservative.

Allowing for no dilution and using the river hardness at the critical condition to develop the metals criteria are protective of water quality.

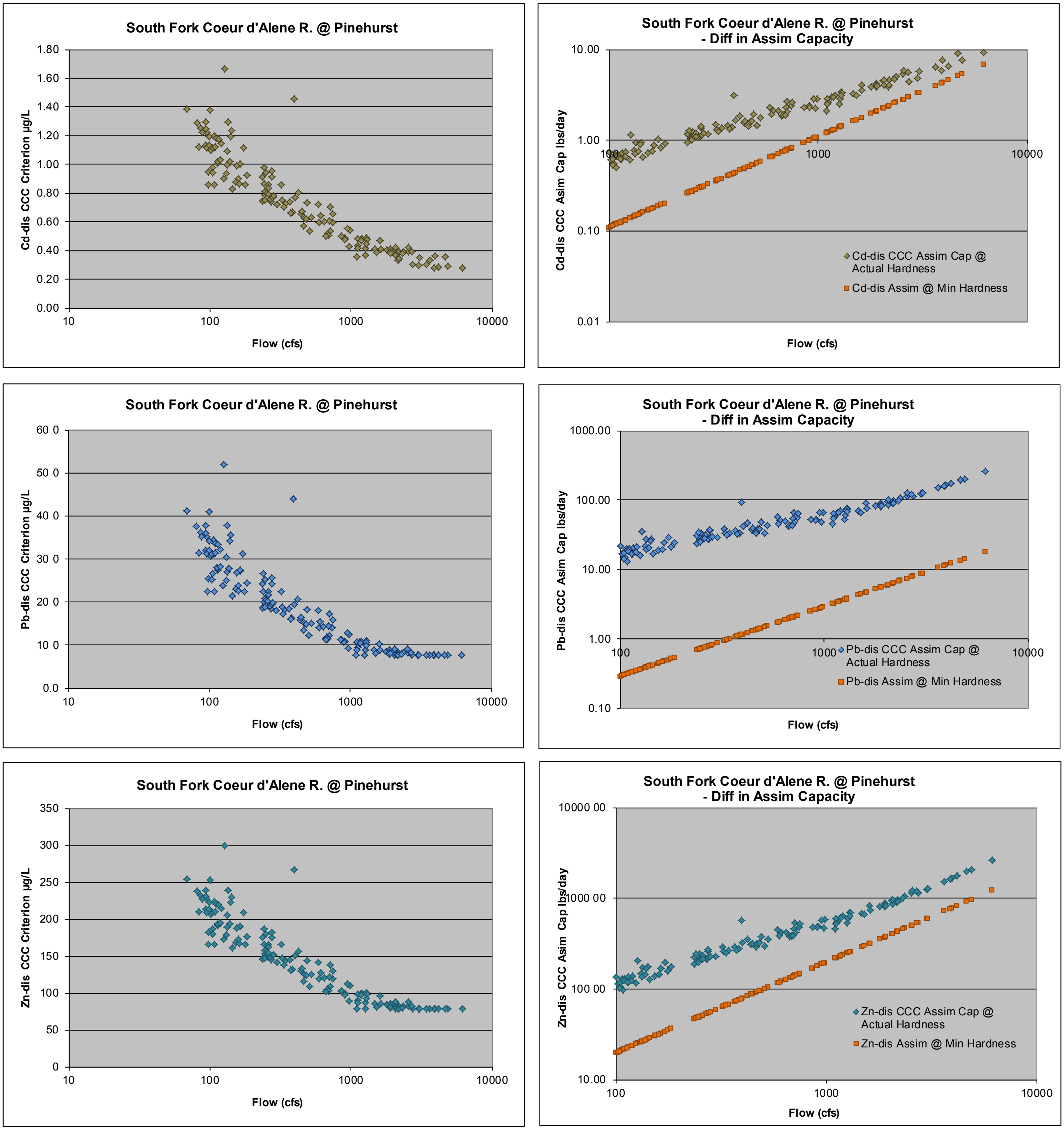


Figure 12. Metals Criteria and Assimilative Capacity vs. River Flow

The hardness-dependent water quality criteria for the metals of concern are expressed as dissolved metal. The dissolved fraction of the metal is the fraction that will pass through a 0.45-micron filter. However, the federal regulation at 40 CFR 122.45(c) requires that NPDES permit effluent limits must be expressed as total recoverable metal. Total recoverable metal is the concentration of the metal in an unfiltered sample. To develop effluent limits for total recoverable metals which are protective of the dissolved metals criteria, "translators" are used in the equations to determine reasonable potential and derive effluent limits. The table below shows the applicable criteria for metals based on the mixed hardness and other toxic chemicals that were detected in the effluent.

The EPA evaluated the potential of the discharge to have reasonable potential to cause or contribute to violations of Idaho's water quality criteria for the pollutants that were found in detectable level in the effluent. See Parts D and E of this Appendix for reasonable potential and effluent limit calculations for these pollutants.

Site Specific Criteria (SSC) for Cadmium, Lead and Zinc

Site-specific water quality criteria (SSC) that reflect local environmental conditions are allowed by federal and state regulations. 40 CFR 131.11 provides States with the opportunity to adopt water quality criteria that are "…modified to reflect site specific conditions."[10] SSC were for Cadmium, Lead and Zinc were adopted by IDEQ in the Water Quality Standards and approved by EPA. The following equations were used to calculate the numeric criteria for these pollutants. The 5th percentile of the effluent hardness at the critical condition was used to calculate the criteria. It was assumed that no mixing zone would be authorized and water quality criteria would be met at the end of pipe. A hardness of 80 mg/L $CaCO_3$ was used to calculate the applicable criteria.

Table 23. Site Specific Criteria Equations for Cadmium, Lead and Zinc

Parameter	CMC (µg/L)	CCC (µg/L)
Cadmium	exp(1.0166 x ln(hardness)-3.924)	[1.101672-(ln(hardness) x 0.041838] x exp(0.7852*LN(hardness)-3.49)
Lead	exp(0.9402 x ln(hardness)+1.1834)	exp(0.9402 x ln(hardness)-0.9875)
Zinc	exp(0.6624 x ln(hardness)+2.2235)	exp(0.6624 x ln(hardness)+2.2235)

[10] Development of Site-Specific Water Quality Criteria for the South Fork Coeur d'Alene River, Idaho, Application Of Site-Specific Water Quality Criteria Developed In Headwater Reaches To Downstream Waters. Idaho Department of Environmental Quality, December 13, 2002, (http://www.deq.idaho.gov/media/445306-sfcda_criteria_downstream.pdf)

Table 24. Applicable Numeric Criteria – Year around

Idaho - Numeric Criteria for Toxic Substances (IDAPA 50.01.02.210)

Sources: IDAPA 58.01.02; EPA National Recommended Water Quality Cr teria

		Notes:
Receiving water Hardness, mg/L as	80	Based on coorelation of hardness and flow at Smelterville gauge (2002-2011). Hardness is 80 or greater at critical river flows (<100 cfs)
Receiving pH	7.6	95th Percentile Smelterville Gauge (2002-2011)
Receiving water TSS, mg/L (leave blank if unknown)		
If TSS is annual data, enter 'A'; if from critical period, enter 'S'; If no TSS, leave blank		
Criteria below calculated using		
Acute Hardness, mg/L:	80.0	
Chronic Hardness, mg/L:	80.0	
Mixed Hardness		
Apply 'Mixed Hardness' (Y/N)?:	N	Consistent with IDAPA 58 01.02 210.03.c ii:, receiving water hardness at the critical condition used.
Effluent Hardness, mg/L:	59	5th percentile DMR Data (2010-2011, representative since drinking water corrosion control lime addition began)
Acute Mixed Hardness, mg/L:	74 8	
Chronic Mixed Hardness, mg/L:	75.7	

Pollutant	Select Pollutant of Concern or enter µg/L	Idaho (Number)	Acute Hardness, mg/L	Chronic Hardness, mg/L	Priority Pollutant?	Carcinogen?	Aquatic Life Criteria, µg/L Acute	Aquatic Life Criteria, µg/L Chronic	Human Health Criteria Water and Organisms, µg/L	Human Health Criteria Organisms only, µg/L	Metals Translators Acute	Metals Translators Chronic
AMMONIA unionized	yes	0.1			N	N						
CADMIUM	yes	4	80	80	Y	N	1.7	0.87	Narrative	Narrative	0.973	0.918
CHLORINE (Total Residual)	yes	121			N	N	19	11				
COPPER	yes	6	80	80	Y	N	13.8	9.4			0.960	0.960
LEAD	yes	7	80	80	Y	N	201	22.9	Narrative	Narrative	1.000	1.000
Z NC	yes	13	80	80	Y	N	168	168	7400.00	26000 00	1.000	1.000

Table 25. Applicable Ammonia Criteria – High Flow – January - June

Freshwater Un-ionized Ammonia Criteria Calculation

Based on DAPA 58 01.02

	pH	Temperature (deg C)	Data Source
Winter (high flow)	7.5	12	95th Percentile, Smelterville Guage, 2002-2011

INPUT	
1. Receiving Water Temperature (deg C):	12.0
2. Receiving Water pH:	7.50
3. Is the receiving water a cold water designated use?	Yes
4. Are non-salmonid early life stages present or absent?	Present
OUTPUT	
1. Unionized ammonia NH3 criteria (mg NH3/L)	
Acute:	0.110
Chronic:	0 018
Total ammonia nitrogen criteria (mg N/L)	
Acute Criterion (CMC)	**13.28**
Chronic Criterion (CCC)	**4.36**

Acute Criteria Equation:

$$\frac{0.275}{1+10^{7.204-\mathrm{pH}}}+\frac{39}{1+10^{\mathrm{pH}-7.204}}$$

Chronic Criteria Equation

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

Table 26. Applicable Ammonia Criteria – Low Flow – June – December

Freshwater Un-ionized Ammonia Criteria Calculation

Based on DAPA 58.01.02

	pH	Temperature (deg C)	Data Source
Summer (low flow)	**7.6**	**18.9**	95th Percentile, Smelterville Guage, 2002-2011

INPUT	
1. Receiving Water Temperature (deg C):	18 9
2. Receiving Water pH:	7.60
3. Is the receiving water a cold water designated use?	Yes
4. Are non-salmonid early life stages present or absent?	Present
OUTPUT	
1. Unionized ammonia NH3 criteria (mg NH3/L)	
Acute:	0.198
Chronic:	0.028
Total ammonia nitrogen criteria (mg N/L)	
Acute Criterion (CMC)	**11.37**
Chronic Criterion (CCC)	**3.00**

Acute Criteria Equation:

$$\frac{0.275}{1+10^{7.204-\mathrm{pH}}}+\frac{39}{1+10^{\mathrm{pH}-7.204}}$$

Chronic Criteria Equation

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

D. Reasonable Potential Analysis

The EPA projects the receiving water concentration (downstream of where the effluent enters the receiving water) for each pollutant of concern when evaluating the effluent to determine if water quality-based effluent limits are needed. 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. The discharge has the reasonable potential to cause or contribute to an exceedance of the applicable water quality standard if the projected concentration of the pollutant in the receiving water exceeds the numeric criterion for that specific chemical. A water quality-based effluent limit is required if there is a reasonable potential of the pollutant to exceed the water quality criteria.

Mixing Zones

The methodology for estimating the dilution within the mixing zone at critical conditions is discussed in appendix C. If the IDEQ 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.

The criterion becomes the WLA when a mixing zone is not authorized. A mixing zone may not be authorized by the IDEQ because the receiving water already exceeds the criterion or the receiving water flow is too low to provide dilution, for example. 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, the EPA calculates effluent limits which are protective of the WLA using statistical procedures described in Appendix D.

E. Methodology for Determining Reasonable Potential

The following describes the process the 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 Idaho's federally approved water quality standards. The EPA uses the process described in the *Technical Support Document for Water Quality-based Toxics Control (*refer to as TSD*)* (EPA, 1991) to determine reasonable potential.

The first step is 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. To determine if there is a reasonable potential, 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.

Mass Balance to Determine Maximum Receiving Water Concentration

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. In this case, the mixing zone is based on complete mixing of the effluent and the receiving water, and MZ is equal to unity (1). Therefore, in this case, Equation D-3 is equal to Equation D-2.

If a mixing zone is not allowed, dilution is not considered when projecting the receiving water concentration and,

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

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

$$\text{Dilution Factor} \quad DF = \frac{Q_d + Q_{\text{critical flow}} \times (\text{percentage of river allowble for mixing})}{Q_d} \qquad \text{(Equation D-5)}$$

Dilution factors were calculated based on low and high seasonal flows using the WWTP design flow. The following table provides the dilution factors used to calculate reasonable potential.

Table 27. Dilution Factors – 50% of River Flow Dilution Allowance

Dilution Factors	Dilution Factor Year Around	Dilution Factor Low Flow (July - November)	Dilution Factor High Flow (December - June)
Dilution Factor - edge of Acute zone	3.9	4.1	4.4
Dilution Factor - edge of Chronic zone	4.7	4.8	5.3
Ammonia	5.2	5.1	6.3
Human Health - Non-Carcinogen	5.4	5.5	7.8
Human Health - Carcinogen	11.7	11.5	11.7

After the dilution factor simplification, Equation D-2 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.

Maximum Projected Effluent Concentration and Reasonable Potential Determination

The EPA has used the procedure described in section 3.3 of the TSD to calculate the maximum projected effluent concentration. The 99^{th} 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 99^{th} percentile is calculated by multiplying the maximum reported effluent concentration by a “reasonable potential multiplier” (RPM). The RPM is the ratio of the 99^{th} 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.

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 copper as an example. Reasonable potential calculations for all pollutants are provided in the following table.

All pollutants for which there was a detectable level of the pollutant were evaluated for the reasonable potential to contribute to violations of the aquatic life criteria. It has been determined that ammonia and chlorine have the potential to contribute to violations of the standards during both the high and low river flow periods.

F. WQ-based Effluent Limitations for the Protection of Aquatic Life Criteria

The following calculations demonstrate how the water quality-based effluent limits (WQBELs) in the draft permit were calculated. The WQBELs ammonia and chlorine are intended to protect aquatic life criteria. The following discussion presents the general equations used to calculate the water quality-based effluent limits. The calculations are incorporated into the reasonable potential worksheet, Tables 28 and 29.

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:

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

Idaho's water quality criteria for some metals are expressed as the dissolved fraction, but the Federal regulation at 40 CFR 122.45(c) requires that effluent limits be expressed as total recoverable metal. The 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.

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

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):

$$LTA_a = WLA_a \times \exp(0.5\sigma^2 - z\sigma) \qquad \text{(Equation F-3)}$$
$$LTA_c = WLA_c \times \exp(0.5\sigma_4^2 - z\sigma_4) \qquad \text{(Equation F-4)}$$

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

$\sigma_4^2 = \ln(CV^2/4 + 1)$

$z = 2.326$ for 99th percentile probability basis

Derive the maximum daily and average monthly effluent limits

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

$$MDL = LTA \times \exp(z_m\sigma - 0.5\sigma^2) \qquad \text{(Equation F-5)}$$
$$AML = LTA \times \exp(z_a\sigma_n - 0.5\sigma_n^2) \qquad \text{(Equation F-6)}$$

where σ, and σ² are defined as they are for the LTA equations (F-2 and F-3) and,

$\sigma_n^2 = \ln(CV^2/n + 1)$

$z_a = 1.645$ for 95th percentile probability basis

$z_m = 2.326$ for 99th percentile probability basis

n = number of sampling events required per month

The following details the calculations for water quality-based effluent limits based on two-value aquatic life criteria.

The following tables show the calculations for the reasonable potential analysis and, where required, the WQ-based effluent limitations.

Ammonia, chlorine, cadmium, lead, and zinc show a reasonable potential to contribute to violations of the WQS. WQ-based effluent limits were established for ammonia on a seasonal basis. Year-around limit were established for chlorine, cadmium, lead and zinc.

Reasonable Potential Analysis - pH

The most stringent water quality criterion for pH is for the protection of aquatic life and aquaculture water supply. The pH criteria for these uses state that the pH must be no less than 6.5 and no greater than 9.0 standard units.

Mixing zones are generally not granted for pH, therefore the most stringent water quality criterion must be met before the effluent is discharged to the receiving water. The draft permit requires that the effluent have a pH of no less than 6.5 and no greater than 9.0 standard units. The analysis was done based on the worst case combined effluent of Page and Smelterville WWTPs. The following table shows that under worst case receiving water conditions at both the high and low river flow conditions the WQ-based effluent limits have no reasonable potential in contributing to non-attainment of the surface water criteria for pH.

Table 28. Reasonable Potential Analysis for pH

Calculation of pH of a Mixture of Two Flows

Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington D.C.)

	Yr. Aournd Basis		
INPUT	**Min Limit**	**Max Limit**	**Comments**
1. Dilution Factor at Mixing Zone Boundary	4.8	4 8	Chronic Dilution Factor at Design Flow and Low River Flow Conditions
2. Ambient/Upstream/Background Conditions			
Temperature (deg C):	19.80	2.00	Max. and min. temperature for lower and upper pH, respec ively, based on USGS Smelterville
pH	6.70	7.60	5th Percentile and 95th Percentile pH for lower and upper pH, respectively, based on USGS data Smelterville.
Akalinity (mg $CaCO_3$/L):	50.00	50.00	No data available. Assume conservative value.
3. Effluent Characteristics			
Temperature (deg C):	24.30	3.50	Max and min for lower and upper temperature, DMR data
pH	**6.50**	**9.00**	Limts estiablished based on WQS. Actual max effluent 7.7, min effluent 6.7 based on permit application.
Akalinity (mg CaCO3/L):	100.00	100.00	No data available. Assume conservative value.
OUTPUT			
1. Ionization Constants			
Upstream/Background pKa:	6.38	6.55	
Effluent pKa:	6.35	6.53	
2. Ionization Fractions			
Upstream/Background Ioniza ion Fraction:	0.67	0.92	
Effluent Ionization Fraction:	0.58	1.00	
3. Total Inorganic Carbon			
Upstream/Background Total Inorganic Carbon (mg CaCO3/L):	74	54	
Effluent Total Inorganic Carbon (mg CaCO3/L):	171	100	
4. Condtions at Mixing Zone Boundary			
Temperature (deg C):	20.73	2.31	
Akalinity (mg CaCO3/L):	60.34	60.34	
Total Inorganic Carbon (mg CaCO3/L):	94.25	63.92	
pKa:	6.38	6.54	
RESULTS			
pH at Mixing Zone Boundary:	**6.63**	**7.77**	Effluent limits based on WQS do not have a reasonable potential to contibute to violations of the pH standards.

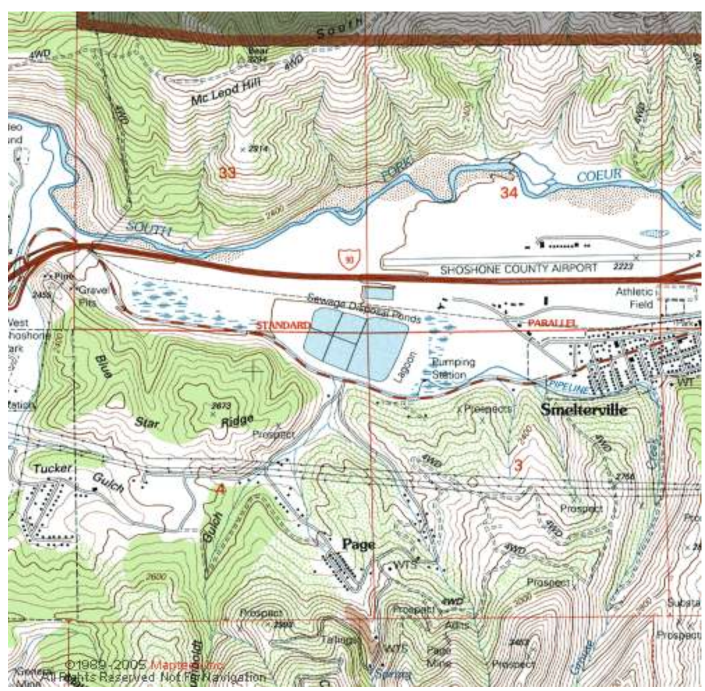
Reasonable Potential Analysis – Dissolved Oxygen

The reasonable potential to cause or contribute to violations of the dissolved oxygen criteria of 6.0 mg/L can be evaluated using the Streeter-Phelps model. The Streeter-Phelps equation (also known as the "dissolved oxygen sag" equation) is based on a mass balance which is affected by two processes. One is that oxygen is removed from water by the degradation of organic materials. In other words, the biochemical oxygen demand of an organic waste is satisfied by oxygen taken from the water. The second process is "reaeration" by oxygen transfer into the water from the atmosphere.

The analysis was done based on the worst case combined effluent of Page and Smelterville WWTPs. The model shows that the downstream DO will read a low of 6 mg/L and therefore is unlikely to contribute to a violation of standard. Estimated worst case was used for input data into the model based on best available information.

Streeter-Phelps Analysis of Critical Dissolved Oxygen Sag

INPUT				
1. EFFLUENT CHARACTERISTICS				
Discharge (cfs)			7.03885	combined flow
CBOD5 (mg/L)			25	Technology based limit for CBOD
NBOD (mg/L):			0	No data
Dissolved Oxygen (mg/L)			2	Estimate
Temperature (deg C)			23	95th Percentile DMR data
2. RECEIVING WATER CHARACTERISTICS				
Upstream Discharge (cfs)			52.6	Low Flow 7Q10
Upstream CBOD5 (mg/L)			1.5	
Upstream NBOD (mg/L):			0.2	
Upstream Dissolved Oxygen (mg/L)			8.32	5th Percentile at Smelterville
Upstream Temperature (deg C)			20.7	95th Percentile at Smelterville
Elevation (ft NGVD):			2200	Topo Map
Downstream Average Channel Slope (ft/ft):			0.00088	
Downstream Average Channel Depth (ft):			4	
Downstream Average Channel Velocity (fps):			1	
3. REAERATION RATE (Base e) at 20 deg C (day^-1):			3.57	
	Applic.	Applic.	Suggested	
Reference	Vel (fps)	Dep (ft)	Values	
Churchill	1.5 - 6	2 - 50	1.14	
O'Connor and Dobbins	0.1 - 1.5	2 - 50	1.62	
Owens	0.1 - 6	1 - 2	1.66	
Tsivoglou-Wallace	0.1 - 6	0.1 - 2	3.65	
4. BOD DECAY RATE (Base e) AT 20 deg C (day^-1):			2.51	
(Suggested value = 2.51, *Wright and McDonnell, 1979*)				
OUTPUT				
1. INITIAL MIXED RIVER CONDITION				
CBOD5 (mg/L):			4.3	
NBOD (mg/L):			0.2	
Dissolved Oxygen (mg/L):			7.6	
Temperature (deg C):			21.0	
2. TEMPERATURE ADJUSTED RATE CONSTANTS (Base e)				
Reaeration (day^-1):			3.65	
BOD Decay (day^-1):			2.62	
3. CALCULATED INITIAL ULTIMATE CBODU AND TOTAL BODU				
Initial Mixed CBODU (mg/L):			6.3	
Initial Mixed Total BODU (CBODU + NBOD, mg/L):			6.5	
4. INITIAL DISSOLVED OXYGEN DEFICIT				
Saturation Dissolved Oxygen (mg/L):			8.223	
Initial Deficit (mg/L):			0.65	
5. TRAVEL TIME TO CRITICAL DO CONCENTRATION (days):			0.28	
6. DISTANCE TO CRITICAL DO CONCENTRATION (miles):			4.62	
7. CRITICAL DO DEFICIT (mg/L):			2.21	
8. CRITICAL DO CONCENTRATION (mg/L)			**6.01**	



Reasonable Potential Analysis – Temperature

The **current EPA- approved aquatic life criteria** for temperature are as follows:

Cold Water Aquatic Life:	Daily Average = 19°C; Max Daily = 22°C This criterion applies from July 16 – September 30. (see IDAPA 58.01.02.250.02.b)
Wastewater Provision:	The wastewater must not affect the receiving water outside the mixing zone so that :…If the water is designated for cold water aquatic life, seasonal cold water aquatic life, or salmonid spawning, the induced variation is more than one (+1) degree C (see IDAPA 58.01.02.401.01.d).

Continuous temperature monitoring of the effluent and the receiving water is necessary to determine daily average and daily maximum temperatures. The daily average and maximum temperatures of both the effluent and receiving water are necessary to accurately determine the reasonable potential to contribute to violations of the various temperature criteria.

The permit required the permittee to collected grab samples for temperature twice per month. Temperature data was reported on the DMR as a monthly average and monthly maximum, refer to DMR data summary, Appendix B. There is insufficient daily data to fully evaluate compliance with temperature standard.

The permit will incorporate daily monitoring of effluent temperature, and the river temperature upstream and downstream from the point of discharge to better evaluate the need for temperature limits in the future.

Reasonable Potential Analysis - E. Coli

The proposed permit does not allow for a mixing zone for bacteria. The permittee must meet the water quality standards at the point of discharge. Therefore, there is not reasonable potential when the permittee is in compliance with the effluent limitations.

The Idaho water quality standards state that waters of the State of Idaho, that are designated for recreation, are not to contain *E. coli* bacteria in concentrations exceeding 126 organisms per 100 ml based on a minimum of five samples taken every three to seven days over a thirty day period. Therefore, the draft permit contains a monthly geometric mean effluent limit for *E. coli* of 126 organisms per 100 ml (IDAPA 58.01.02.251.01.a.).

The Idaho water quality standards also state that a water sample that exceeds certain “single sample maximum” values indicates a likely exceedance of the geometric mean criterion, although it is not, in and of itself, a violation of water quality standards. For waters designated for primary contact recreation, the “single sample maximum” value is 406 organisms per 100 ml (IDAPA 58.01.02.251.01.b.ii.).

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. Additionally, the terms “average monthly limit” and “average weekly limit” are defined in 40 CFR 122.2 as being arithmetic (as opposed to geometric) averages. It is impracticable to properly implement a 30-day geometric mean criterion in a permit using monthly and weekly arithmetic average limits. The geometric mean of a given data set is equal to the arithmetic mean of that data set if and only if all of the values in that data set are equal. Otherwise, the geometric mean is always less than the arithmetic mean. In order to ensure that the effluent limits are “derived from and comply with” the geometric mean water quality criterion, as required by 40 CFR 122.44(d)(1)(vii)(A), it is necessary to express the effluent limits as a monthly geometric mean and an instantaneous maximum limit.

Reasonable Potential Analysis – Turbidity

There was insufficient information to adequately evaluate the impacts of the discharge on turbidity. Typical a simple mixing model can be used to evaluate the final turbidity downstream from the point of discharge. There was limited data about turbidity upstream and downstream from the USGS gauge stations at Smelterville and Pinehurst, respectively. Additionally, the permittee is required to monitoring total suspended solids (TSS) and not turbidity.

It is assumed that the technology-based limit for TSS is protective of water quality for turbidity. The waterbody is impaired for TSS for which a TMDL has completed and a wasteload has been allocated to the Smelterville WWTP.

Reasonable Potential Analysis – Numeric Criteria

The following Excel® worksheets incorporate both Reasonable Potential Analysis and, as needed, water-quality based effluent limitations (WQBELs). TSD calls for using n≥4 if the limit is based on the chronic long term average (LTAc) because the chronic criterion is based on 4-days. (Reference EPA Technical Support Document, March 1991, Section 5.5.3, page 107)

Table 29. Reasonable Potential and Limits for Aquatic Life Criteria – Low Flow

Reasonable Potential Calculation

Facility:	SFCDSD - Smelterville WWTP
Water Body Type	Freshwater

Water Designation	Dilution Factors	
Aquatic Life - Acute Criteria - Criterion Max. Concentration (CMC)	4.1	1Q10
Aquatic Life - Chronic Criteria - Criterion Continuous Concentration (CCC)	4.8	7Q10 or 4B3
Ammonia	5.1	30B3
Human Health - Non-Carcinogen	5.5	30Q5
Humn Health - carcinogen	11.5	Harmonic Mean Flow

Receiving Water Hardness = 80 mg/L

Receiving Water Temp, C	18.9	95th percentile USGS Smelterville (2004-2011) (larger data set t
Receiving Water pH	7.6	95th percentile USGS Smelterville (2004-2011) (larger data set t

Pollutant			AMMONIA, Criteria as Total NH3	CHLORINE (Total Residual)	CADMIUM	LEAD	ZINC
Effluent Data	# of Samples (n)		416	2080	82	82	82
	Coeff of Variation (Cv)		0.6	0.6	0.84	0.69	0.95
	Effluent Concentration, µg/L (Max. or 95th Percentile)		26,100	560	8 9	26	1058
	Calculated 50th percentile Effluent Conc. (when n>10)				3 6	12.3	371.7
Mizing Zone Used	Aquatic Life - Acute		4.1	4.1	1.0	1.0	1.0
	Aquatice Life - Chronic			4.8	1.0	1.0	1.0
	Ammonia		5.1			1.0	1.0
	Human Health - Non-Carcinogen			5.5	1.0	1.0	1.0
	Humn Health - carcinogen			11.5	1.0	1.0	1.0
Receiving Water Data	90th Percentile Conc., µg/L		78.0	1.6			
	Geo Mean, µg/L						
Water Quality Criteria	Aquatic Life Criteria, µg/L	Acute	11 375	19	1.7	201	168
		Chronic	2,997	11	0.87	22.9	168
	Human Health Water and Organism, µg/L		-	-	Narrative	Narrative	7400
	Human Health, Organism Only, µg/L		-	-	Narrative	Narrative	26000
	Metal Criteria Translator, decimal	Acute	-	-	0.973	1.000	1.000
		Chronic	-	-	0.918	1.000	1.000
	Carcinogen?		N	N	N	N	N

Aquatic Life Reasonable Potential

			Ammonia	Chlorine	Cadmium	Lead	Zinc
σ	$\sigma 2=\ln(CV^2+1)$		0.555	0.555	0.731	0 624	0 802
Pn	$=(1\text{-confidence level})^{1/n}$	99%	0.989	0.998	0.945	0 945	0 945
Multiplier	$=\exp(2.3262\sigma-0.5\sigma^2)/\exp(\text{invnorm}(P_N)\sigma-0.5\sigma^2)$	99%	1.0	0.7	1.7	1.6	1.8
Max. conc.(ug/L) at		Acute	6,591	104.2	14.7	40.9	1891
		Chronic	5 234	88.0	13 9	40.9	1891
Reasonable Potential? Limit Required?			**YES**	**YES**	**YES**	**YES**	**YES**

Aquatic Life Limit Calculation

			Ammonia	Chlorine	Cadmium	Lead	Zinc
n = # samples assumed to calculate AML			30	20	4	4	1
# of Compliance Samples Expected per month			**4**	**20**	**1**	**1**	**1**
LTA Coeff. Var. (CV),	default = 0.6 or calculate from data		0.6	0 6	0.84	0.69	0.95
Permit Limit Coeff. Var. (CV), decimal			0.6	0 6	0.84	0.69	0.95
Waste Load Allocations,	$C_d=(C_r x MZ_a)-C_{sa} x(MZ_a-1)$	Acute	46 120.6	72.52	1.65	201.02	168.37
	$C_d=(C_r x MZ_c)-C_{sc}*(MZ_c-1)$	Chronic	15,108.1	47.06	0.87	22.93	168.37
Long Term Averages, ug	$WLAa \times \exp(0.5\sigma^2-2.326\sigma)$	Acute	14 808.6	23.28	0.39	57.20	**35.96**
	$WLAc \times \exp(0.5\sigma^2-2.326\sigma)$; ammonia n=30	Chronic	**11,788.8**	**24.82**	**0.37**	**11.12**	65.28
Limiting LTA, ug/L	used as basis for limits calculation		11,788.8	23.28	0.37	11.12	35.96
Metal Translator or 1?			1.00	1.00	0.918	1.000	1.000
Average Monthly Limit (AML), ug/L		**95%**	**14025**	**29**	**0.72**	**18**	**98**
Maximum Daily Limit (MDL), ug/L		**99%**	36723	**73**	**1.7**	**39**	**168**
Average Monthly Limit (AML), mg/L			**14.02**	0.029	0.001	0.018	0.098
Maximum Daily Limit (MDL), mgL			**36.72**	0.073	0.002	0.039	0.168
Average Monthly Limit (AML), lb/day, Smelterville Flow		**0.25**	**29.2**	**0.06**	**0.0015**	**0.038**	**0.20**
Maximum Daily Limit (MDL), lb/day, Smelterville Flow		**0.25**	**76.6**	**0.15**	**0.0035**	**0.081**	**0.35**

Human Health Reasonable Potential

	Ammonia	Chlorine	Cadmium	Lead	Zinc
s					0.802
Pn			0.964	0.964	0.964
Multiplier					0.24
Dilution Factor			5.5	5.5	5.5
Max Conc. at edge of Chronic Zone, ug/L					67.713
Reasonable Potential to exceed HH Water & Organism			NO	NO	**NO**
Reasonable Potential to exceed HH Organism only			NO	NO	**NO**

Comments/Notes:

References: IDAPA 58 01.02

Technical Support Document for Water Quality-based Toxics Control US EPA March 1991 EPA/505/2-90-001 pages 56/99

Note: The ammonia limit presented in the above table is based on the wasteload allocation proportional to the effluent flow. Refer to Section G for the assigned permit limits.

Table 30. Reasonable Potential and Limits for Aquatic Life Criteria – High Flow

Reasonable Potential Calculation

Facility:	SFCDSD - Page WWTP
Water Body Type	Freshwater

Water Designation	Dilution Factors	
Aquatic Life - Acute Criteria - Criterion Max. Concentration (CMC)	**4.4**	1Q10
Aquatic Life - Chronic Criteria - Criterion Continuous Concentration (CCC)	**5.3**	7Q10 or 4B3
Ammonia	**6.3**	30B3
Human Health - Non-Carcinogen	**7.8**	30Q5
Humn Health - carcinogen	**11.7**	Harmonic Mean Flow

Receiving Water Hardness = 80 mg/L

Receiving Water Temp, C	12	95th percentile USGS Smelterville (2004-2011) (larger data set than DMR)
Receiving Water pH	7.5	95th percentile USGS Smelterville (2004-2011) (larger data set than DMR)

Pollutant			AMMONIA, Criteria as Total NH3	CHLORINE (Total Residual)	CADMIUM	LEAD	ZINC
Effluent Data	# of Samples (n)		416	2080	82	82	82
	Coeff of Variation (Cv)		0.6	0.6	0 84	0.69	0 95
	Effluent Concentration, µg/L (Max. or 95th Percentile)		26,100	560	8.9	26	1058
	Calculated 50th percentile Effluent Conc. (when n>10)				3.6	12.3	371.7
Mizing Zone Used	Aquatic Life - Acute		4.4	4.4	1.0	1.0	1 0
	Aquatice Life - Chronic			5.3	1.0	1.0	1 0
	Ammonia		6.3			1.0	1 0
	Human Health - Non-Carcinogen			7.8	1.0	1.0	1 0
	Humn Health - carcinogen			11.7	1.0	1.0	1 0
Receiving Water Data	90th Percentile Conc., µg/L		78.0	1.6	11	280	1490
	Geo Mean µg/L						
Water Quality Criteria	Aquatic Life Criteria, µg/L	Acute	13,283	19	1.7	201	168
		Chronic	4,364	11	0 87	22.9	168
	Human Health Water and Organism, µg/L		-	-	Narrative	Narrative	7400
	Human Health, Organism Only, µg/L		-	-	Narrative	Narrative	26000
	Metal Criteria Translator, decimal	Acute	-	-	0 9730	1 0000	1.0000
		Chronic	-	-	0 9183	1 0000	1.0000
	Carcinogen?		N	N	N	N	N

Aquatic Life Reasonable Potential

			Ammonia	Chlorine	Cadmium	Lead	Zinc
σ	$\sigma 2=\ln(CV^2+1)$		0 555	0.555	0.731	0 624	0.802
Pn	$=(1\text{-confidence level})^{1/n}$	99%	0 989	0.998	0 945	0 945	0.945
Multiplier	$=\exp(2.3262\sigma-0.5\sigma^2)/\exp(\text{invnorm}(P_N)\sigma-0.5\sigma^2)$	99%	1.0	0.7	1.7	1.6	1 8
Max. conc.(ug/L) at		Acute	6 079	96.1	14.7	40.9	1891
		Chronic	4 292	80.2	13.9	40.9	1891
Reasonable Potential? Limit Required?			**NO**	**YES**	**YES**	**YES**	**YES**

Aquatic Life Limit Calculation

			Ammonia	Chlorine	Cadmium	Lead	Zinc
n = # samples assumed to calculate AML				20	4	4	1
# of Compliance Samples Expected per month				**20**	**1**	**1**	**1**
LTA Coeff. Var. (CV),	default = 0.6 or calculate from data			0.6	0 84	0.69	0 95
Permit Limit Coeff. Var. (CV), decimal				0.6	0 84	0.69	0 95
Waste Load Allocations,	$C_d=(C_r xMZ_a)-C_{s\,a}x(MZ_a-1)$	Acute		78.58	1 65	201.02	168.37
	$C_d=(C_r xMZ_c)-C_{sc}*(MZ_c-1)$	Chronic		51.60	0 87	22.93	168.37
Long Term Averages, ug	WLAa x $\exp(0.5\sigma^2-2.326\sigma)$	Acute		**25.23**	0 39	57.20	**35.96**
	WLAc x $\exp(0.5\sigma^2-2.326\sigma)$; ammonia n=30	Chronic		27.21	**0.37**	**11.12**	65 28
Limiting LTA, ug/L	used as basis for limits calculation			25.23	0 37	11.12	35 96
Metal Translator or 1?				1.00	0.92	1.00	1 00
Average Monthly Limit (AML), ug/L		**95%**		**31**	**0.72**	**18**	**98**
Maximum Daily Limit (MDL), ug/L		**99%**		**79**	**1.7**	**39**	**168**
Average Monthly Limit (AML), mg/L				0.031	0 001	0.018	0.098
Maximum Daily Limit (MDL), mgL				0.079	0 002	0.039	0.168
Average Monthly Limit (AML), lb/day, Page Flow		**0.25**	47	**0.06**	**0.002**	**0.04**	**0.2**
Maximum Daily Limit (MDL), lb/day, Page Flow		**0.25**	122	**0.16**	**0.004**	**0.08**	**0.4**

Human Health Reasonable Potential

	Ammonia	Chlorine	Cadmium	Lead	Zinc
s					0.802
Pn			0 964	0.964	0.964
Multiplier					0 24
Dilution Factor			7.8	7.8	7 8
Max Conc. at edge of Chronic Zone, ug/L					47.884
Reasonable Potential to exceed HH Water & Organism			NO	NO	**NO**
Reasonable Potential to exceed HH Organism only			NO	NO	**NO**

Human Health Limit Calculation

# of Compliance Samples Expected per month	
Average Monthly Effluent Limit, ug/L	
Maximum Daily Effluent Limit, ug/L	

Comments/Notes:

References: IDAPA 58.01.02

Technical Support Document for Water Quality-based Toxics Control US EPA March 1991 EPA/505/2-90-001 pages 56/99

G. Alternate Water Quality-Based Effluent Limits for Page and Smelterville

The propose permit recognizes the shared mixing zone for the Page and Smelterville WWTPs. As such, the allowable dilution for each facility is much less than in the current permits. The following equation describes the mass balance for total load as the sum of load from each facility.

$$Q_t \times C_t = Q_p \times C_p + Q_s \times C_s$$

where
Q_p = Design flow of Page WWTP (mdg)
Q_s = Design flow of Smelterville WWTP (mdg)
C_p = Concentration limit for Page WWTP (mg/L)
C_s = Concentration limit for Smelterville WWTP (mg/L)
Q_t = Design flow combined WWTPs (mdg)
C_t = water quality based effluent limit for both (mg/L)

The following table describes the possible load allocations for each facility that would meet the total load allocation based on the limits calculations. The table includes the current permit limits for each of the facilities.

The proposed permit recommends a load allocation that would allow each facility to reliably meet the proposed permit limits. A load allocation that provides slightly more load to Smelterville than would be allotted based on flow alone would allow both facilities to meet the limits in the proposed permit. Page represents 95% of the total flow based on design flow.

Table 31. Possible Ammonia Load Allocations for Shared Mixing Zone

	Percent of total flow - Page	Percent of total flow - Smelterville	AML Load - Page	AML Conc - Page	AML Load - Smelterville	AML Conc - Smelterville	MDL Load - Page	MDL Conc - Page	MDL Load - Smelterville	MDL Conc - Smelterville	AML Total Load	MDL Total Load
Based on Design Flows	95%	5%	502.8	**14.0**	29.2	**14.0**	1316 9	36.7	76.6	36.7	532	1393
	94%	6%	497.5	**13.9**	34.6	**16.6**	1302 9	36.3	90.5	43.4	532	1393
	93%	7%	492.1	**13.7**	39.9	**19.1**	1289 0	35.9	104.4	50.1	532	1393
	92%	8%	486.8	**13.6**	45.2	**21.7**	1275.1	35.6	118.4	56 8	532	1393
	91%	9%	481.5	**13.4**	50.5	**24.2**	1261.1	35.2	132.3	63 5	532	1393
Proposed	90%	10%	476.2	**13.3**	55.8	**26.8**	1247 2	34.8	146.2	70.1	532	1393
	89%	11%	470.9	**13.1**	61.2	**29.3**	1233 2	34.4	160.2	76 8	532	1393
	88%	12%	465.5	**13.0**	66.5	**31.9**	1219 3	34.0	174.1	83 5	532	1393
	87%	13%	460.2	**12.8**	71.8	**34.4**	1205.4	33.6	188.0	90 2	532	1393
	86%	14%	454.9	**12.7**	77.1	**37.0**	1191.4	33.2	202.0	96 9	532	1393
	85%	15%	449.6	**12.5**	82.4	**39.5**	1177 5	32.8	215.9	103.6	532	1393
Page current limit/Load	84%	16%	444.3	**12.4**	87.8	**42.1**	1163.6	32.4	229.8	110 2	532	1393
Load/Limit in Current Permit			445	**12**	284	***136***	760	21	1095	*525*	729	1855
Reduction in Total Load in Proposed Permit											197	462
Performance during current Permit												
Ammonia Conctrations mg/L	Permit Max in past 2 years			16.7		28.1		18.1		29.6		
Ammonia Conctrations mg/L	95th Percentile duration of permit			17		24.1		18.3		26.1		

Note higher numbers more recently for Smelterville
Note lower numbers more recently for Page

H. Calculate TMDL-based Effluent Limits for TSS

The TMDL established a load allocation for TSS of 24.6 tons per year. The weekly average limit is calculated by multiplying the monthly average limit by factor 2.01. This factor is from EPA Technical Support Document, table 5-4. Multipliers for calculating Maximum Daily Permit Limits from Average Monthly Permit Limits for n=4, CV=0.6 (default CV used since actually CV based on individual TSS data was unavailable).

$$\text{Monthly Avearge Mass Limit} = \frac{24.6 \text{ tons}}{\text{year}} \times \frac{2000 \text{ lbs}}{\text{ton}} \times \frac{\text{year}}{365 \text{ days}} = 134.8 \, \frac{\text{lbs}}{\text{day}}$$

$$\text{Weekly Averge Mass Limit} = \; 134.8 \, \frac{\text{lbs}}{\text{day}} \times 2.01 = 271 \, \frac{\text{lbs}}{\text{day}}$$

The TMDL-based limits are greater than the technology-based limits therefore the technology-based limits will be used in the proposed permit.

I. Interim Effluent Limitations for Cadmium, Lead and Zinc

Upon expiration of the approved variance for Cadmium, Lead and Zinc, the EPA has established a performance-based effluent limitation based on the existing treatment ability to treat these pollutants and based on the level of these pollutants in the discharge over duration of the current permit.

For consistency, the performance-based limits were calculated using the same methodology as previous variance-based limits incorporating addition new data collected (Nov. 2008-July 2011) since the variance limits were developed.

Figure 13. Interim Effluent Limits for Cadmium, Lead and Zinc

Performance Based Limits					units	**Cadmium**		**Lead**		**Zinc**	
Using Data 2004-2011				Average	ug/L	**3.66**		**12.44**		**374.15**	
				Minimum	ug/L	0.00369		0.0162		0.0000018	
				Maximum	ug/L	**13**		**41.2**		**1240**	
				Count	ug/L	81		81		81	
				Std Dev	ug/L	3.0		8.3		353.1	
				CV	ug/L	**0.817**		**0.665**		**0.944**	
				95th Percentile	ug/L	9.0		26.0		1060.0	
				95th Percentile	ug/L	0.1		3.6		0.2	
			samples per month n			1.0		1.0		1.0	
Method for Variance			σ	σ2=ln(CV²+1)		0.715		0.605		0.798	
			Pn	=(1-confidence level)$^{1/n}$	99%	0.945		0.945		0.945	
99% - 99%			RP Multiplier	=exp(2.3262σ-0.5σ²)/exp(invnorm(P_N)σ-0.5σ²)	99%	1.69		1.56		1.79	
			Design Flow =		0.25	ug/L	lb/day	ug/L	lb/day	ug/L	lb/day
maximum expected concentration, TSD page 57				MDL=MAX x RPA Multiplier		**21.9**	**0.046**	**64.1**	**0.134**	**2220.9**	**4.631**
Table 5-3 value			0.99		0.95	1.63		1.51		1.72	
				AML = MDL/Multiplier		**13.5**	**0.028**	**42.4**	**0.088**	**1289.2**	**2.688**

The current variance-based limits were based on data from August 2004 through October 2008. The performance-based data calculated from the larger data set are more stringent.

Parameter		2009 Variance		Interim Limtis	
	Units	Average Monthly	Maximum Daily	Average Monthly	Maximum Daily
Cadmium	µg/L	17.5	29.7	**13.5**	**21.9**
	lb/day	0.19	0.30	**0.028**	**0.046**
Lead	µg/L	46	85	**42**	**64**
	lb/day	0.096	0.18	**0.013**	**0.088**
Zinc	µg/L	1,994	3,490	**1,290**	**2,220**
	lb/day	4.0	7.0	**2.7**	**4.6**

Appendix E: Variance

A variance is a temporary relaxation of water quality standards. Variances are granted by IDEQ to facilities for specified pollutants in their wastewater based upon a rationale as to why more time is needed to meet the prevailing criteria. The allowed reasons for a variance are the same as for beneficial use changes under a use attainablity analysis.

Variance documents are available on the IDEQ website at http://www.deq.idaho.gov/water-quality/surface-water/standards/variances.aspx.

Appendix F: Biological Evaluation

Section 7 of the Endangered Species Act (ESA) requires federal agencies to consult with the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS) and the U. S. Fish and Wildlife Service (USFWS) if their actions could beneficially or adversely affect any threatened or endangered species and/or their critical habitat. EPA has reviewed the ESA-listed species and critical habitat data on each of the agency's websites. There are no ESA-listed species and critical habitat in the vicinity of the discharge. EPA determined that the reissuance of the NPDES permit to the City of Smelterville for discharges of treated municipal wastewater to the South Fork Coeur d'Alene River will have "no effect" on any of the threatened or endangered species or their critical habitat in the vicinity of the discharges. Additionally, EPA determines that the reissuance of the NPDES permit will not adversely affect Essential Fish Habitat (EFH).

The information below summarizes the threatened and endangered species in the State of Idaho and in the vicinity of the discharges.

Threatened and Endangered Species in Idaho are available on the USFWS website at http://www.fws.gov/endangered/

For Shoshone County, Idaho

Group	**Name**	**Population**	**Status**	**Lead Office**	**Recovery Plan Name**	**Recovery Plan Action Status**	**Recovery Plan Stage**
Fishes	Bull Trout (*Salvelinus confluentus*)	U.S.A., conterminous, lower 48 states	Threatened	Idaho Fish And Wildlife Office Office Name: Idaho Fish And Wildlife Office Address: 1387 SOUTH VINNELL WAY, SUITE 368 BOISE, ID83709 Phone Number: (208)378-5243	Draft Recovery Plan for the Jarbidge River Distinct Population Segment of Bull Trout	View Implementation Progress	Draft
Mammals	Canada Lynx (*Lynx canadensis*)	(Contiguous U.S. DPS)	Threatened	Montana Ecological Services Field Office Office Name: Montana Ecological Services Field Office Address: 585 Shepard Way HELENA, MT59601 Phone Number: (406)449-5225	Recovery Outline for the Contiguous United States Distinct Population Segment of Canada Lynx (Lynx canadensis)	Recovery efforts in progress, but no implementation information yet to display.	Outline

U.S Fish & Wildlife Service shows no designated critical habitat information in either Shoshone County. http://criticalhabitat.fws.gov/crithab/. Critical habitat shown in yellow.

Figure 14. Critical Habitat

NOAA"s Essential Fish Habitat Mapper (http://sharpfin.nmfs.noaa.gov/website/EFH_Mapper/map.aspx) shows not essential fish habitat in the vicinity of the proposed action. EFH shown in yellow.

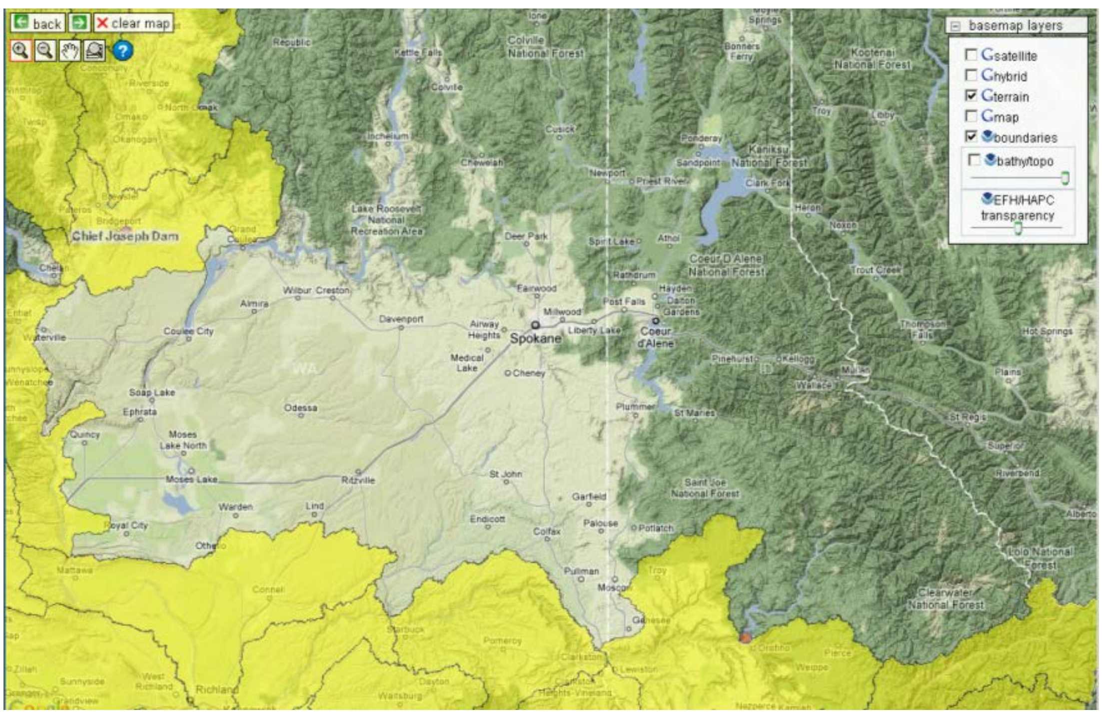


Figure 15. Essential Fish Habitat

Appendix G: Tribal Review or Consultation

The Coeur d'Alene Tribe reservation is located around the south end of Lake Coeur d'Alene. The South Fork Coeur d'Alene river joins the North Fork Coeur d'Alene River near Pinehurst to for the Coeur d'Alene River. The Coeur D'Alene River flows into Lake Coeur d'Alene just north of the reservation boundary as shown in the figure below. The EPA invite the tribe to review and/or consult on this permit because it the potential of the discharge to impact Lake Coeur d'Alene.

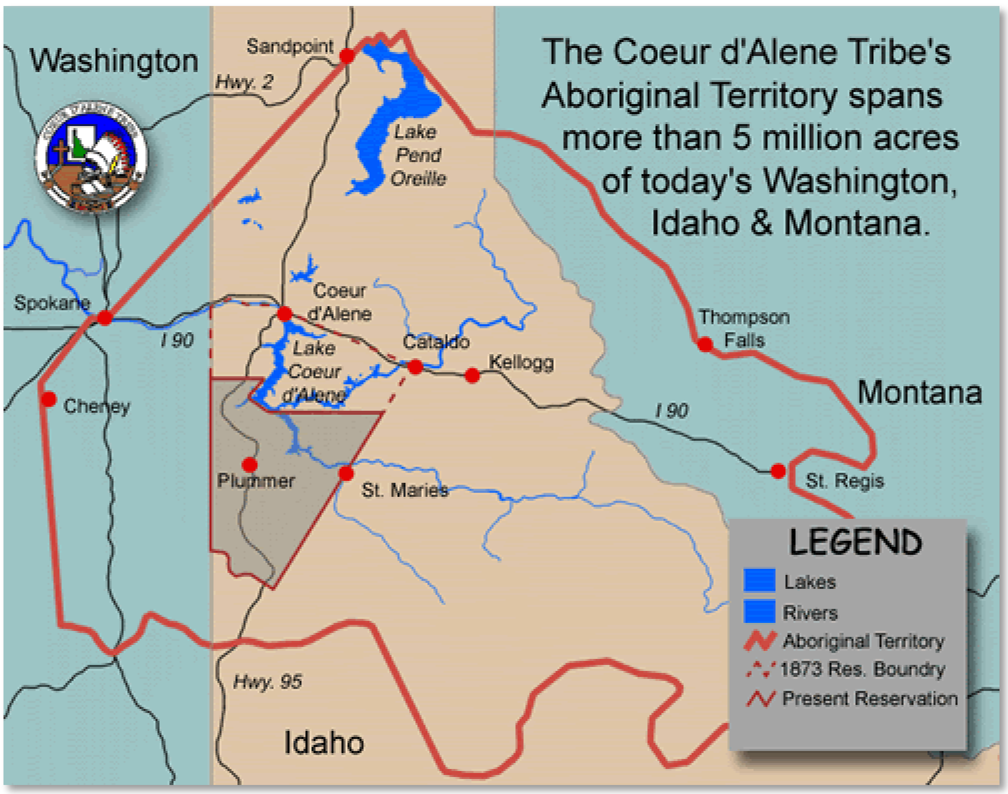


Figure 16. Coeur d'Alene Tribe Boundary[11]

The EPA did not receive comments from the Coeur d'Alene Tribe during their review of the preliminary draft permit.

[11] Source: Coeur d'Alene Tribe Webpage http://www.cdatribe-nsn.gov/

Appendix H: State Certification

The Idaho Department of Environmental Quality provided the draft §401 Water Quality Certification on December 28, 2012.

Pursuant to the provisions of Section 401(a)(1) of the Federal Water Pollution Control Act (Clean Water Act), as amended; 33 U.S.C. Section 1341(a)(1); and Idaho Code §§ 39-101 et seq. and 39-3601 et seq., the Idaho Department of Environmental Quality (DEQ) has authority to review National Pollutant Discharge Elimination System (NPDES) permits and issue water quality certification decisions.

DEQ certified that if the permittee complies with the terms and conditions imposed by the permit along with the conditions set forth in this water quality certification, then there is reasonable assurance the discharge will comply with the applicable requirements of Sections 301, 302, 303, 306, and 307 of the Clean Water Act, the Idaho Water Quality Standards (WQS) (IDAPA 58.01.02), and other appropriate water quality requirements of state law.

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

2110 Ironwood Parkway • Coeur d'Alene, Idaho 83814 • (208) 769 1422

C.L. "Butch" Otter, Governor
Toni Hardesty, Director

December 28, 2012

Mr. Michael Lidgard
US Environmental Protection Agency, Region 10
1200 6th Avenue, OW-130
Seattle, WA 98101

RE: Draft §401 Water Quality Certification for the Draft NPDES Permit No. ID0020117 for the Smelterville Wastewater Treatment Plant

Dear Mr. Lidgard:

The State of Idaho Department of Enviro mental Quality (DEQ) received a preliminary draft NPDES permit dated June 28, 2012 for the Smelterville Wastewater Treatment Plant to discharge from their existing facility. After review of the draft permit and fact sheet, DEQ submits the enclosed draft §401 water quality certification which includes a narrative description of our antidegradation review for this permit and the compliance schedule justification. After the public comment period ends, DEQ will address any comments, review the proposed final permit and issue a final certification decision.

Please direct any questions to June Bergquist at 208.666.4605 or june.bergquist@deq.idaho.gov .

Sincerely,

Daniel Redline
Regional Administrator
Coeur d'Alene Regional Office

Enclosures (1)

C: Miranda Adams, DEQ Boise
Karen Burgess, EPA Region 10, Seattle
City of Smelterville, Mayor Larry Huber

Idaho Department of Environmental Quality

Draft §401 Water Quality Certification

December 28, 2012

NPDES Permit Number(s): ID0020117 Smelterville Wastewater Treatment Plant

Receiving Water Body: South Fork Coeur d'Alene River

Pursuant to the provisions of Section 401(a)(1) of the Federal Water Pollution Control Act (Clean Water Act), as amended; 33 U.S.C. Section 1341(a)(1); and Idaho Code §§ 39-101 et seq. and 39-3601 et seq., the Idaho Department of Environmental Quality (DEQ) has authority to review National Pollutant Discharge Elimination System (NPDES) permits and issue water quality certification decisions.

Based upon its review of the above-referenced permit and associated fact sheet, DEQ certifies that if the permittee complies with the terms and conditions imposed by the permit along with the conditions set forth in this water quality certification, then there is reasonable assurance the discharge will comply with the applicable requirements of Sections 301, 302, 303, 306, and 307 of the Clean Water Act, the Idaho Water Quality Standards (WQS) (IDAPA 58.01.02), and other appropriate water quality requirements of state law.

This certification does not constitute authorization of the permitted activities by any other state or federal agency or private person or entity. This certification does not excuse the permit holder from the obligation to obtain any other necessary approvals, authorizations, or permits.

Antidegradation Review

The WQS contain an antidegradation policy providing three levels of protection to water bodies in Idaho (IDAPA 58.01.02.051).

- Tier 1 Protection. The first level of protection applies to all water bodies subject to Clean Water Act jurisdiction and ensures that existing uses of a water body and the level of water quality necessary to protect those existing uses will be maintained and protected (IDAPA 58.01.02.051.01; 58.01.02.052.01). Additionally, a Tier 1 review is performed for all new or reissued permits or licenses (IDAPA 58.01.02.052.07).
- Tier 2 Protection. The second level of protection applies to those water bodies considered high quality and ensures that no lowering of water quality will be allowed unless deemed necessary to accommodate important economic or social development (IDAPA 58.01.02.051.02; 58.01.02.052.08).
- Tier 3 Protection. The third level of protection applies to water bodies that have been designated outstanding resource waters and requires that activities not cause a lowering of water quality (IDAPA 58.01.02.051.03; 58.01.02.052.09).

DEQ is employing a water body by water body approach to implementing Idaho's antidegradation policy. This approach means that any water body fully supporting its beneficial uses will be considered high quality (IDAPA 58.01.02.052.05.a). Any water body not fully supporting its beneficial uses will be provided Tier 1 protection for that use, unless specific circumstances warranting Tier 2 protection are met (IDAPA 58.01.02.052.05.c). The most recent federally approved Integrated Report and supporting data are used to determine support status and the tier of protection (IDAPA 58.01.02.052.05).

Pollutants of Concern

The Smelterville Wastewater Treatment Plant discharges the following pollutants of concern: BOD5, TSS, E. coli bacteria, pH, chlorine, ammonia, cadmium, lead, zinc, temperature, nitrate + nitrite, oil and grease, phosphorus and Kjeldahl nitrogen. Effluent limits have been developed for BOD5, TSS, E. coli, pH, chlorine, ammonia, cadmium, lead and zinc. No effluent limits are proposed for temperature, nitrate + nitrite, oil and grease, phosphorus, and Kjeldahl nitrogen however, there are monitoring requirements for each of these pollutants. There was insufficient information to determine if the discharge would contribute to violations of the temperature criteria so additional monitoring was added to the permit. In addition to other requirements, nutrient monitoring is part of a larger effort to identify nutrient contributions to Coeur d'Alene Lake per the Coeur d'Alene Lake management Plan (Coeur d'Alene Tribe/DEQ, 2009).

Receiving Water Body Level of Protection

The Smelterville Wastewater Treatment Plant discharges to the South Fork Coeur d'Alene River assessment unit (AU) ID17010302PN001_03 Canyon Creek to mouth. This AU has the following designated beneficial uses: cold water aquatic life, salmonid spawning, secondary contact recreation, agricultural and industrial water supply, wildlife habitats and aesthetics. There is no available information indicating the presence of any existing beneficial use aside from those that are already designated.

The cold water aquatic life use in the South Fork Coeur d'Alene River AU is not fully supported due to excess cadmium, lead, zinc, sediment and temperature (2010 Integrated Report). The secondary contact recreation beneficial use has not been assessed; however, E. coli data collected in 1998 and 2005 indicate that recreation uses are fully supported (DEQ Beneficial Use Reconnaissance Program data from 1998 and 2005). As such, DEQ will provide Tier 1 protection only for the aquatic life use and Tier 2 protection, in addition to Tier 1, for the recreation beneficial use (IDAPA 58.01.02.051.02; 58.01.02.051.01).

Protection and Maintenance of Existing Uses (Tier 1 Protection)

As noted above, a Tier 1 review is performed for all new or reissued permits or licenses, applies to all waters subject to the jurisdiction of the Clean Water Act, and requires demonstration that existing uses and the level of water quality necessary to protect existing uses shall be maintained and protected. In order to protect and maintain designated and existing beneficial uses, a permitted discharge must comply with narrative and numeric criteria of the Idaho WQS, as well as other provisions of the WQS such as Section 055, which addresses water quality limited waters. The numeric and narrative criteria in the WQS are set at levels that ensure protection of designated beneficial uses. The effluent limitations and associated requirements contained in the

Smelterville Wastewater Treatment Plant permit are set at levels that ensure compliance with the narrative and numeric criteria in the WQS.

Water bodies not supporting existing or designated beneficial uses must be identified as water quality limited, and a total maximum daily load (TMDL) must be prepared for those pollutants causing impairment. A central purpose of TMDLs is to establish wasteload allocations for point source discharges, which are set at levels designed to help restore the water body to a condition that supports existing and designated beneficial uses. Discharge permits must contain limitations that are consistent with wasteload allocations in the approved TMDL. The EPA-approved *South Fork Coeur d'Alene River sediment Subbasin Assessment and Total Maximum Daily Load,* (DEQ, 2002) includes a wasteload allocation for the Smelterville WWTP discharge. The proposed permit contains a limitation that is consistent with the sediment wasteload allocation.

In the absence of a TMDL and depending upon the priority status for development of a TMDL, the WQS stipulate that either there be no further impairment of the designated or existing beneficial uses or that the total load of the impairing pollutant remains constant or decreases (IDAPA 58.01.02.055.04 and 58.01.02.055.05). Discharge permits must comply with these provisions of Idaho WQS.

TMDLs have not yet been developed for the metal pollutants but this is a high priority segment for the development of a TMDL. A TMDL for temperature has been drafted but is not yet complete. Interim effluent limits in the draft permit for metals are more stringent than those currently allowed under the 2009 variance. There is also no proposed change in design flow, influent quality, or treatment processes that would result in increased discharge of temperature or metals. Therefore, the proposed permit ensures that the total load of temperature, cadmium, lead and zinc will remain constant or decrease, in compliance with IDAPA 58.01.02.055.04, as well as IDAPA 58.01.02.051.01 and 58.01.02.052.01.

High-Quality Waters (Tier 2 Protection)

The South Fork Coeur d'Alene River is not assessed for recreational use support. As noted above, Beneficial Use Reconnaissance Monitoring data for *E. coli* collected by DEQ in 1999 and 2005 indicate that the South Fork Coeur d'Alene River is high quality for the secondary contact recreation beneficial use. As such, the water quality relevant to the secondary contact recreation use of the South Fork Coeur d'Alene River must be maintained and protected, unless a lowering of water quality is deemed necessary to accommodate important social or economic development.

To determine whether degradation will occur, DEQ must evaluate how the permit issuance will affect water quality for each pollutant that is relevant to secondary contact recreation use of the South Fork Coeur d'Alene River (IDAPA 58.01.02.052.05). These include the following: E. coli, mercury, zinc and phosphorus. Effluent limits are set in the proposed and existing permit for E. coli, bacteria and zinc (discussion follows).

For a reissued permit or license, the effect on water quality is determined by looking at the difference in water quality that would result from the activity or discharge as authorized in the current permit and the water quality that would result from the activity or discharge as proposed in the reissued permit or license (IDAPA 58.01.02.052.06.a). For a new permit or license, the effect on water quality is determined by reviewing the difference between the existing receiving water quality and the water quality that would result from the activity or discharge as proposed in the new permit or license (IDAPA 58.01.02.052.06.a).

Pollutants with Limits in the Current and Proposed Permit: *E. coli* and Zinc

For pollutants that are currently limited (have effluent limits) and will have limits under the reissued permit, the current discharge quality is based on the limits in the current permit or license (IDAPA 58.01.02.052.06.a.i), and the future discharge quality is based on the proposed permit limits (IDAPA 58.01.02.052.06.a.ii). For the Smelterville Wastewater Treatment Plant permit, this means determining the permit's effect on water quality based upon the limits for *E. coli* in the current and proposed permits. Table 1 provides a summary of the current permit limits and the proposed or reissued permit limits. There were no changes in the E. coli effluent limit from the current to the proposed permit and no changes in design flow or treatment process. Therefore, no adverse change in water quality and no degradation will result from the discharge of E. coli.

While the South Fork Coeur d'Alene River is Tier 2 for recreational uses, it is also impaired for aquatic life uses due to excess zinc. Because zinc is relevant to both uses, and the water quality standards require both uses be protected, the use with the more stringent requirement limits the zinc levels. Thus, the zinc levels must be reduced to get the River back into compliance with criteria for support of aquatic life uses. This needed reduction is reflected in the proposed compliance schedule and final permit limits. The final limits in the permit require a significant reduction in zinc. These limits meet the Tier 2 requirement under the antidegradation policy because there will be no degradation in water quality, but rather an improvement in zinc levels.

Pollutants with No Limits: Mercury and Phosphorus

There are two pollutants of concern mercury and phosphorus, relevant to Tier 2 protection of recreation that currently are not limited and for which the proposed permit also contains no limit (Table 1). For such pollutants, a change in water quality is determined by reviewing whether changes in production, treatment, or operation that will increase the discharge of these pollutants are likely (IDAPA 58.01.02.052.06.a.ii). With respect to mercury and phosphorus, there are no reasons to believe these pollutants will be discharged in quantities greater than those discharged under the current permit. This conclusion is based upon the fact that there have been no changes in the design flow, influent quality, or treatment processes that would likely result in an increased discharge of this pollutant. Because the proposed permit does not allow for any increased water quality impact from this pollutant, DEQ has concluded that the proposed permit should not cause a lowering of water quality for the pollutant with no limit. As such, the proposed permit should maintain the existing high water quality for secondary contact recreation in South Fork Coeur d'Alene River.

Table 1. Comparison of current and proposed permit limits for pollutants of concern.

Pollutant	Units	Current Permit			Proposed Permit			Change[a]
		Average Monthly Limit	Average Weekly Limit	Max. Daily Limit	Average Monthly Limit	Average Weekly Limit	Max. Daily Limit	
Pollutants with limits in both the current and proposed permit								
Five-Day BOD	mg/L	45	65	—	45	65	—	NC
	lb/day	94	136	—	94	136	—	
	% removal	65%	—	—	65%	—	—	
TSS	mg/L	45	65	—	45	65	—	NC
	lb/day	94	136	—	94	136	—	
	% removal	65%	—	—	65%	—	—	
pH	standard units	6.5–9.0 all times			6.5–9.0 all times			NC
E. coli	no./100 mL	126	—	576	126	—	576	NC
Total Residual Chlorine (interim)	µg/L	410	—	560	410	—	560	NC
	lb/day	0.85	—	1.2	0.85	—	1.2	
Total Residual Chlorine (Final) Effective 1-1-14	µg/L	—	—	—	29	—	73	D
	lb/day	—	—	—	0.06	—	0.15	D
[b]Ammonia (year round)	mg/L	136	—	525	—	—	—	NC
	lb/day	284	—	1095	—	—	—	NC
Ammonia low flow (July-Dec)	mg/L	—	—	—	26.8	—	70.1	D
	lb/day	—	—	—	56	—	146	D
VARIANCE LIMITS in effect until midnight July 30, 2014								
[c]Cadmium	µg/L	17.5	—	29.8	—	—	—	NC
	lb/day	0.036	—	0.062	—	—	—	NC
Lead	µg/L	46	—	85	—	—	—	NC
	lb/day	0.96	—	0.18	—	—	—	NC
Zinc	µg/L	1994	—	3490	—	—	—	NC
	lb/day	4.0	—	7.0	—	—	—	NC
NEW INTERIM LIMITS from July 31, 2014 through December 31, 2032								
Cadmium	µg/L	—	—	—	13.5	—	21.9	D
	lb/day	—	—	—	0.028	—	0.046	D
Lead	µg/L	—	—	—	42	—	64	D
	lb/day	—	—	—	0.013	—	0.088	D
Zinc	µg/L	—	—	—	1290	—	2220	D
	lb/day	—	—	—	2.7	—	4.6	D
FINAL LIMITS Effective January 1, 2033								
Cadmium	µg/L	—	—	—	0.72	—	1.7	D
	lb/day	—	—	—	0.0015	—	0.0035	D
Lead	µg/L	—	—	—	18	—	39	D
	lb/day	—	—	—	0.038	—	0.081	D
Zinc	µg/L	—	—	—	98	—	168	D
	lb/day	—	—	—	0.20	—	0.35	D
Pollutants with no limits in both the current and proposed permit								
Temperature	°C	—	2X/mo	Report	Report	5X/wk	Report	NC
Oil and Grease	mg/L	—	—	—	Report	—	Report	NC
Total Phosphorus	µg/L	—	—	Report	Report	—	Report	NC
Kjeldahl Nitrogen	mg/L	—	—	Report	Report	—	Report	NC
Nitrate + nitrite	mg/L	—	—	Report	Report	—	Report	NC

[a] NC = no change in effluent limit from current permit; I = increase of pollutants from current permit; D = decrease of pollutants from current permit;

[b] Ammonia had no reasonable potential to exceed WQS under high flow conditions and therefore, was not given an effluent limit.

[c] Variance load limits for cadmium were incorrect (AML=0.19lb/day and MDL=0.18lb/day). The values presented in the table are the corrected values based on concentration and design flow.

Conditions Necessary to Ensure Compliance with Water Quality Standards or Other Appropriate Water Quality Requirements of State Law

Compliance Schedule

Pursuant to IDAPA 58.01.02.400.03, DEQ may authorize compliance schedules for water quality-based effluent limits when they are issued in a permit for the first time. Smelterville Wastewater Treatment Plant cannot immediately achieve compliance with the effluent limits for chlorine, cadmium, lead and zinc; therefore, DEQ authorizes a compliance schedule and interim requirements as set forth below. This compliance schedule provides the permittee a reasonable amount of time to achieve the final effluent limits as specified in the permit. At the same time, the schedule ensures that compliance with the final effluent limits is accomplished as soon as possible.

1. The permittee must comply with all effluent limitations and monitoring requirements in Part I beginning on the effective date of the permit, except those for which a compliance schedule is specified as shown in Part I and II of the permit.
2. A schedule of compliance is authorized upon issuance of this permit for chlorine for a period of one year. By the end of the first year of the permit cycle, the permittee must have installed a system to dechlorinate the effluent and meet the final water quality-based effluent limit on the first day of the second year in the permit cycle.
3. A schedule of compliance is authorized on August 1, 2014 (after the expiration of the DEQ authorized variance dated June 5, 2009) for the following pollutants:
   a) Cadmium
   b) Lead
   c) Zinc
4. The permittee must achieve compliance with the final effluent limitations for cadmium, lead and zinc as set forth in Part I.B. (Table 1) of the permit, not later than twenty (20) years from August 1, 2014. If an approved TMDL for cadmium, lead and zinc is developed prior to the expiration date of the compliance schedule and the TMDL contains wasteload allocations for this discharge, then those wasteload allocations will replace the final effluent limits in Table 1. Superfund related metals enter this wastewater collection system through inflow and infiltration and possibly other, as yet, unknown pathways. Because of this circumstance and the uncertainty of Superfund cleanup progress, the compliance schedule duration may be amended if the permittee submits compelling evidence that the presence of Superfund related metals prevents them from meeting WQS for cadmium, lead and zinc within the 20 year timeframe. The evidence must also demonstrate that the treatment system itself is not a source of dissolved metals. Results of facility planning, special studies, implementation of conditions of the permit, implementation of conditions required by this 401 certification, and/or new Bunker Hill Superfund related information are all sources of potentially new

information not available at this time which could further our understanding of the source of metals in this wastewater discharge. The permittee must provide the evidence along with a new proposed compliance schedule timeframe and submit it for DEQ's review and approval as part of their application for renewal of this permit.

5. While the schedule of compliance specified in Part II of the permit is in effect, the permittee must meet interim effluent limits, monitoring requirements, and special conditions as specified in parts I and II of the permit.

6. All other provisions of the permit, except the interim and final effluent limits for chlorine, cadmium, lead and zinc must be met after the effective date of the final permit.

Compliance Schedule Justification

A 20 year compliance schedule is being allowed for the Smelterville WWTP to meet final effluent limits for cadmium, lead and zinc. This schedule provides the time needed to evaluate the existing conditions, determine the source of metals in the treated effluent, conduct facility planning to evaluate treatment options, if necessary, and construct any necessary treatment facilities. This compliance schedule is reasonable given the resources of the permittee, the influence of historic sources of metals and the related schedule for addressing ground water and surface water quality in the Upper Basin of the Coeur d'Alene River Basin.

The *Interim Record of Decision (ROD) Amendment, Upper Basin of the Coeur d'Alene River Bunker Hill Mining and Metallurgical Complex Superfund Site* (EPA, August 2012) was recently issued. This amendment lays out a 30 year timeframe to accomplish selected remedies for surface water, soil, sediments and groundwater in the Upper Basin (which includes the South Fork Coeur d'Alene River). Smelterville's collection system and discharge point is located within the Upper Basin of the Bunker Hill Superfund site.

As a result of being located where ground water, surface water and soils have been impacted with Superfund-related pollutants, Smelterville experiences excess amounts of cadmium, lead and zinc in their treated wastewater. To address this problem Smelterville has replaced their entire collection system. Monitoring since that time indicates that there are still elevated metals in the treated effluent and that more study is necessary to determine the source and subsequent remedy, if possible. Even though the collection system is new, inflow and infiltration may still be allowing metals contaminated ground water into the system. Implementation of the remedies set out in the ROD may influence the ability of Smelterville to meet metal limits at their outfall. As a result, it is reasonable to establish the compliance schedule so that the effort to meet standards at the Smelterville facility can take advantage of, and are coordinated with, ROD implementation.

In addition, implementation of the ROD may affect the WQS for portions of the South Fork Coeur d'Alene River which, in turn, would affect the effluent limits for the Smelterville wastewater treatment plant. Part of the ROD Amendment's 30 year cleanup plan is an attempt to meet ambient water quality standards for the South Fork Coeur d'Alene River. If the cleanup is unsuccessful in meeting this water quality goal, the ROD Amendment indicates the possibility of issuing a Technical Impracticability waiver for specific locations and a revised water quality goal for these waterbody segments. Currently, it is unknown if the cleanup plan can achieve its goals and where along the South Fork Coeur d'Alene River it may improve water quality or determine it impracticable. This has the potential to affect WQS and subsequently effluent limits for some dischargers.

Given the above factors, a 20 year compliance schedule was determined to be the minimum amount of time necessary to 1) investigate the source of metals in the treated effluent and develop a facility plan which ensures that treatment systems function optimally and effluent limits for non-metal pollutants can be met year round. After this investigation and treatment optimization, dischargers will have an accurate assessment of their remaining metals load so an appropriate metals treatment can be selected and constructed, if necessary. The Compliance Schedule and Facility Planning Requirement provide finite deadlines for these improvements; clear direction and milestones to check progress; and 2) coordinate with ROD implementation activities.

Mixing Zones

Pursuant to IDAPA 58.01.02.060, DEQ authorizes a mixing zone shared with Page WWTP that utilizes 50% of the critical flow volumes of South Fork Coeur d'Alene River for chlorine and ammonia (July-Dec).

Other Conditions

This certification is conditioned upon the requirement that any material modification of the permit or the permitted activities including without limitation, any modifications of the permit to reflect new or modified TMDLs, wasteload allocations, site-specific criteria, variances, or other new information shall first be provided to DEQ for review to determine compliance with Idaho WQS and to provide additional certification pursuant to Section 401.

Right to Appeal Final Certification

The final Section 401 Water Quality Certification may be appealed by submitting a petition to initiate a contested case, pursuant to Idaho Code § 39-107(5) and the "Rules of Administrative Procedure before the Board of Environmental Quality" (IDAPA 58.01.23), within 35 days of the date of the final certification.

Questions or comments regarding the actions taken in this certification should be directed to June Bergquist, Coeur d'Alene Regional Office at 208.666.4605 or via email at june.bergquist@deq.idaho.gov .

DRAT
Daniel Redline
Regional Administrator
Coeur d'Alene Regional Office