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Revised Fact Sheet

Public Comment Start Date:
Public Comment Expiration Date:

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Proposed Reissuance of a National Pollutant Discharge Elimination System (NPDES) Permit to Discharge Pollutants Pursuant to the Provisions of the Clean Water Act (CWA)

City of Coeur d'Alene
Wastewater Treatment Plant

EPA Proposes To Reissue NPDES Permit
The EPA proposes to reissue an NPDES permit to the facility referenced above. The draft permit places conditions on the discharge of pollutants from the wastewater treatment plant to waters of the United States. In order to ensure protection of water quality and human health, the permit places limits on the types and amounts of pollutants that can be discharged from the facility.

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

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

Regional Administrator
Idaho Department of Environmental Quality
2110 Ironwood Pkwy
Coeur d'Alene, ID 83814

Public Comment
Pursuant to 40 CFR 124.14(c), at this time, the EPA is only accepting comments on aspects of the draft permit that are different from those in the draft permit that was issued for public comment on February 16, 2007. These are as follows:

- The final effluent limitations for total phosphorus, five day carbonaceous biochemical oxygen demand ($CBOD_5$), total suspended solids (TSS), ammonia, silver, and zinc have been revised (see the revised draft permit at Table 1, Part I.B).
- The draft permit now includes effluent limits for cadmium.
- The permit allows the permittee to demonstrate compliance with loading (i.e., lb/day) limits for cadmium and lead that were specified by the State of Idaho in its draft Clean Water Act Section 401 certification by developing and implementing an offset plan.
- The schedule of compliance for new water quality-based $CBOD_5$ limits has been deleted (see the revised draft permit at Part I.C).
- The schedules of compliance, including the interim milestones and the effluent limitations for phosphorus (which apply during the term of the compliance schedule) have been revised (see the revised draft permit at Part I.D).
- Surface water monitoring requirements have been changed (see the revised draft permit at Part I.F).
- The compliance evaluation level for total residual chlorine effluent limits has been changed from 100 µg/L to 50 µg/L.
- The draft permit now requires more frequent effluent monitoring for whole effluent toxicity and total residual chlorine relative to the 2007 draft permit (see the revised draft permit at Parts I.B and I.E).
- In addition to more frequent monitoring, the draft permit includes additional requirements for whole effluent toxicity testing (e.g. accelerated testing, toxicity reduction evaluation) to ensure consistency with EPA guidance (see the revised draft permit at Part I.E).
- The permit now includes influent and effluent monitoring requirements for 2,3,7,8 tetrachlorodibenzo-p-dioxin (2,3,7,8 TCDD) (see the revised draft permit at Parts I.B and II.I).
- The phosphorus management plan requirements have been changed (see the revised draft permit at Part II.B).
- The permit now includes best management practices requirements intended to reduce the discharge of polychlorinated biphenyls (PCBs) and 2,3,7,8 TCDD (see the revised draft permit at Part II.I).
- The permit now requires the permittee to participate in the Spokane River Regional Toxics Task Force (see the revised draft permit at Part II.H).

Persons wishing to comment on the tentative determinations contained in the draft permit may do so in writing to the above address or by e-mail to “Nickel.Brian@epa.gov” within 45 days of the date of this public notice. Comments must be received within the 45 day period to be considered in the formulation of final determinations regarding the applications. All comments should include the name, address and telephone number of the commenter and a concise statement of the exact basis of any comment and the relevant facts upon which it is based. All written comments and requests should be submitted to the EPA at the above address to the attention of

the Director, Office of Water and Watersheds.

Workshop and Public Hearing
A workshop and public hearing will be held.

Date: TBD
Time: Workshop from 5:00 PM to 7:00 PM
Public hearing from 7:00 PM to 9:00 PM
Place: TBD

Comments made on the draft permits at the public hearing will become part of the administrative record for the permits, along with any written comments received.

After the Public Notice expires, and all comments have been considered, the EPA's regional Director for the Office of Water will make a final decision regarding permit issuance. If no substantive comments are received, the proposed conditions in the draft permit will become final, and the permit will become effective upon issuance. If comments are received, the EPA will address the comments and issue the permit. The permit will become effective 30 days after the issuance date, unless an appeal is submitted to the Environmental Appeals Board within 30 days of the service of notice of the final permit decision.

Documents are Available for Review
The draft NPDES permit and related documents can be reviewed or obtained by visiting or contacting the EPA's Regional Office in Seattle between 8:30 a.m. and 4:00 p.m., Monday through Friday at the address below. The draft permits, fact sheet, and other information can also be found by visiting the Region 10 NPDES website at "http://epa.gov/r10earth/waterpermits.htm."

United States Environmental Protection Agency
Region 10
1200 Sixth Avenue
Suite 900 M/S OWW-130
Seattle, Washington 98101
(206) 553-6251 or
Toll Free 1-800-424-4372 (within Alaska, Idaho, Oregon and Washington)

The fact sheet and draft permits are also available at:

Idaho Department of Environmental Quality
Coeur d'Alene Regional Office
2110 Ironwood Pkwy
Coeur d'Alene, ID 83814
208-799-4370
1-877-541-3304

Post Falls Library

821 North Spokane Street
Post Falls, ID 83854
208-773-1506

Hayden Lake Library
8385 North Government Way
Hayden, ID 83835
208-772-5612, ext. 11

U.S. Environmental Protection Agency
Idaho Operations Office
1435 North Orchard
Boise, ID 83706
208-378-5748

U.S. Environmental Protection Agency
Coeur d'Alene Field Office
1910 Northwest Blvd., Suite 208
Coeur d'Alene, ID 83814
208-665-0458

Washington State Department of Ecology
Eastern Regional Office
4601 North Monroe Street, Suite 202
Spokane, WA 99205-1295
509-329-3400

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Acronyms

1Q10	1 day, 10 year low flow
7Q10	7 day, 10 year low flow
30B3	Biologically-based design flow intended to ensure an excursion frequency of less than once every three years, for a 30-day average flow.
AML	Average Monthly Limit
BOD_5	Biochemical oxygen demand, five-day
°C	Degrees Celsius
CFR	Code of Federal Regulations
CV	Coefficient of Variation
CWA	Clean Water Act
DMR	Discharge Monitoring Report
DO	Dissolved oxygen
EFH	Essential Fish Habitat
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
IDEQ	Idaho Department of Environmental Quality
lbs/day	Pounds per day
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
N	Nitrogen
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
OW	Office of Water
O&M	Operations and maintenance
POTW	Publicly owned treatment works
QAP	Quality assurance plan

RP	Reasonable Potential
RPM	Reasonable Potential Multiplier
RWC	Receiving Water Concentration
s.u.	Standard Units
TMDL	Total Maximum Daily Load
TSD	Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001)
TSS	Total suspended solids
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
WLA	Wasteload allocation
WQBEL	Water quality-based effluent limit
WWTP	Wastewater treatment plant

I. Applicant

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

City of Coeur d'Alene
NPDES Permit # ID0022853

Mailing Address:
710 East Mullan Avenue
Coeur d'Alene, ID 83814

Physical Address:
915 Hubbard Avenue
Coeur d'Alene, ID 83814

Contact:
Sid Fredrickson, Superintendent

II. Scope of Reopened Public Comment Period

Federal regulations state that comments filed during a reopened comment period shall be limited to the substantial new questions that caused its reopening, and that the public notice under 40 CFR 124.10 shall define the scope of the reopening (40 CFR 124.14). As stated in the public notice, the EPA is only accepting comments on permit conditions that are different from those proposed in the draft permit that was issued for public review and comment on February 16, 2007.

The EPA is making significant changes to the draft permit as it was proposed in February 2007. These changes result from comments made during the initial public comment period, the availability of the final *Spokane River and Lake Spokane Dissolved Oxygen Total Maximum Daily Load: Water Quality Improvement Report*, hereinafter referred to as the "Spokane DO TMDL" (Ecology 2010), more recent effluent and receiving water quality and quantity data, updated computer modeling of the impact of the discharge, a revised draft Clean Water Act (CWA) Section 401 certification prepared by the Idaho Department of Environmental Quality (IDEQ), and EPA guidance documents. To allow the public an opportunity to comment on all of these changes, the EPA has decided to reopen the public comment period to accept comments on these specific changes. The changed conditions are as follows:

- The final effluent limitations for total phosphorus (TP), five day carbonaceous biochemical oxygen demand ($CBOD_5$), total suspended solids (TSS), ammonia, silver, and zinc have been revised (see the revised draft permit at Table 1, Part I.B).
- The draft permit now includes effluent limits for cadmium and zinc.
- The permit allows the permittee to demonstrate compliance with loading (i.e., lb/day) limits for cadmium and lead that were specified by the State of Idaho in its draft Clean Water Act Section 401 certification by developing and implementing an offset plan.
- The schedule of compliance for new water quality-based $CBOD_5$ limits has been deleted (see the revised draft permit at Part I.C).

- The schedules of compliance, including the interim milestones and the effluent limitations for phosphorus (which apply during the term of the compliance schedule) have been revised (see the revised draft permit at Part I.D).Surface water monitoring requirements have been changed (see the revised draft permit at Part I.F).
- The compliance evaluation level for total residual chlorine effluent limits has been changed from 100 µg/L to 50 µg/L.
- The draft permit now requires more frequent effluent monitoring for whole effluent toxicity and total residual chlorine relative to the 2007 draft permit (see the revised draft permit at Parts I.B and I.E).
- In addition to more frequent monitoring, the draft permit includes additional requirements for whole effluent toxicity testing (e.g. accelerated testing, toxicity reduction evaluation) to ensure consistency with EPA guidance (see the revised draft permit at Part I.E).
- The permit now includes influent and effluent monitoring requirements for 2,3,7,8 tetrachlorodibenzo-p-dioxin (2,3,7,8 TCDD) (see the revised draft permit at Parts I.B and II.I).
- The phosphorus management plan requirements have been changed (see the revised draft permit at Part II.B).
- The permit now includes best management practices requirements intended to reduce the discharge of polychlorinated biphenyls (PCBs) and 2,3,7,8 TCDD (see the revised draft permit at Part II.I).
- The permit now requires the permittee to participate in the Spokane River Regional Toxics Task Force (see the revised draft permit at Part II.H).

III. Facility Information

In general, facility information is provided in the fact sheet for the initial public comment period dated February 16, 2007. A map of the treatment plant and discharge location is provided in Appendix A.

IV. Receiving Water

This facility discharges to the Spokane River in Kootenai County, Idaho. The outfall location is between the outlet of Lake Coeur d'Alene and the Post Falls Dam, about one-half mile upstream of the US Highway 95 bridge at river mile 110.2.

A. Low Flow Conditions

The *Technical Support Document for Water Quality-Based Toxics Control* (hereinafter 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. However, because the chronic criterion for ammonia is a 30-day average concentration not to be exceeded more than once every three years, the EPA has used the 30Q10 for the chronic ammonia criterion instead of the 7Q10. In the 2007 draft permit, the 30B3 flow rate was generally paired with the chronic ammonia criterion.

However, later versions of the software used to calculate low flow conditions do not allow the calculation of the 30B3 flow rate on a seasonal basis, so the 30Q10 flow rate has been used instead of the 30B3. The 30Q10 is as protective as the 30B3 and may be used instead of the 30B3 (64 FR 71976).

The EPA has re-calculated the low flow values, using more recent river flow data, since the close of the 2007 public comment period. The values in Table 1 were calculated using data from the Post Falls gauge (USGS station # 12419000), using a period of record of 1978-2008.

The seasons used to calculate the critical low flows have also been changed relative to the 2007 draft permit and fact sheet in order to match the seasonal calculations used to develop the 1999 permit. This allows a direct comparison to determine if the effluent limits in the 1999 permit remain adequate to protect water quality in the Spokane River.

From July – September, the critical low flow rates based on historical data are less than the minimum flow rates specified in the Federal Energy Regulatory Commission (FERC) license for the Post Falls Dam. The EPA has used the FERC minimum flows for effluent limit calculations, in lieu of the historical low flows.

Table 1: Seasonal Low Flows in the Spokane River

Season	1Q10 (CFS)	7Q10 (CFS)	30Q10 (CFS)
October – June	890	1030	1270
July – Sep. (based on historical data)	248	292	363
July – Sep. (FERC license)	500		

B. Water Quality Standards

Section 301(b)(1)(C) of the Clean Water Act (Act) requires that NPDES permits contain effluent limits more stringent than technology-based limits when necessary to meet water quality standards. A State's water quality standards are composed of use classifications, numeric and/or narrative water quality criteria, and an anti-degradation policy. The use classification system designates the beneficial uses (such as cold water aquatic life, contact recreation, etc.) that each water body is expected to achieve. The numeric and/or narrative water quality criteria are the criteria deemed necessary by the State to support the beneficial use classification of each water body. The anti-degradation policy represents a three-tiered approach to maintain and protect various levels of water quality and uses.

Idaho Water Quality Standards

At the point of discharge, the Spokane River is protected for the following designated uses (IDAPA 58.01.02.110.12):

- cold water aquatic life habitat
- salmonid spawning
- primary contact recreation
- domestic water supply

In addition, the Idaho Water Quality Standards 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).

Primary contact recreation is defined by the Idaho Water Quality Standards as "water quality appropriate for prolonged and intimate contact by humans or for recreational activities when the ingestion of small quantities of water is likely to occur. Such activities include, but are not restricted to swimming, water skiing, or skin diving."

The Spokane River also has site-specific criteria for ammonia (IDAPA 58.01.02.283). The site-specific ammonia criteria are identical to the statewide ammonia criteria for waters designated for cold water aquatic life when early life stages of fish are present (IDAPA 58.01.02.250.02.d.).

Idaho's Antidegradation Policy

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. The antidegradation analysis is conducted as part of the State's CWA Section 401 certification (see Appendix H).

Washington Water Quality Standards

The City of Coeur d'Alene wastewater treatment plant outfall is located approximately 14 river miles upstream from the Washington border. Federal regulations require that NPDES permits include conditions necessary to ensure compliance with the water quality requirements of all affected States (40 CFR 122.4(d), 40 CFR 122.44(d)(4), see also CWA Section 401(a)(2)). Therefore it is necessary to determine if the discharge has the reasonable potential to cause or contribute to excursions above Washington's water quality standards, in addition to Idaho's water quality standards. If the discharge has the reasonable potential to cause or contribute to excursions above Washington's water quality standards, effluent limits must be established, which ensure compliance with Washington's water quality standards, in addition to Idaho's water quality standards. The EPA has determined that the discharge has the reasonable potential to cause or contribute to excursions above Washington's water quality standards for dissolved oxygen, and has established effluent limits for total phosphorus (TP), total ammonia as nitrogen (N), and $CBOD_5$ which ensure compliance with both Idaho's and Washington's water quality standards for nutrients and dissolved oxygen. See Appendix B for a complete discussion of the effluent limits based upon Washington's water quality standards.

C. Water Quality Limited Segment

A water quality limited segment is any waterbody, or definable portion of a waterbody, where it is known that water quality does not meet applicable water quality standards, and/or is not expected to meet applicable water quality standards. In accordance with section 303(d) of the Clean Water Act, States must identify waters not achieving water quality standards in spite of the application of technology-based controls in National Pollutant Discharge Elimination System (NPDES) permits for point sources. Such waterbodies are known as water quality limited segments (WQLSs), and the list of such waterbodies is called the "303(d) list." Once a water body is identified as a WQLS, the States are required under the Clean Water Act to develop a total maximum daily load (TMDL). A TMDL is a determination of the amount of a pollutant, or property of a pollutant, from point, nonpoint, and natural background sources (including a margin of safety) that may be discharged to a water body without causing the water body to

exceed the water quality criterion for that pollutant. The Spokane River flows through Idaho and Washington, and various segments of the river are water quality limited in both States.

Total Phosphorus (Idaho)

The Spokane River is listed in Idaho's 2010 303(d)/305(b) integrated report as not attaining or not being expected to attain water quality standards for total phosphorus. As explained in Appendix B, the water quality-based effluent limits for total phosphorus in the draft permit will ensure compliance with Idaho's narrative water quality criterion for nutrients (IDAPA 58.01.02.200.06).

Cadmium, Lead and Zinc (Idaho)

The segment of the Spokane River to which the City of Coeur d'Alene discharges was listed in Idaho's 1998 303(d) list as not attaining or not expected to meet State water quality standards for cadmium, lead, and zinc. In August of 2000, the EPA approved a TMDL submitted by the State of Idaho for metals in the Coeur d'Alene River Basin, which included this segment of the Spokane River. However, in 2003, the Idaho Supreme Court determined that the TMDL was invalid. Therefore, the Spokane River remains listed in the 2010 303(d)/305(b) integrated report as being impaired for cadmium, lead, and zinc.

Even though the Idaho Supreme Court invalidated the Coeur d'Alene River Basin TMDL under State law, the EPA must nonetheless evaluate whether water quality-based effluent limits are necessary for cadmium, lead, and zinc under CWA regulations at 40 CFR 122.44(d)(1)(i – iii), and assure that any such effluent limits are derived from and comply with applicable water quality standards (40 CFR 122.44(d)(1)(vii)(A)). Furthermore, NPDES permits issued by the EPA must incorporate the requirements specified in a CWA Section 401 certification (40 CFR 122.44(d)(3), 124.53(e), 124.55(a)(2)).

The 1999 permit (as modified in 2004) included effluent limits for zinc. The EPA has determined that the concentration effluent limits for zinc in the 1999 permit (as modified in 2004) are not stringent enough to ensure compliance with Idaho's water quality criteria. Therefore, the EPA has proposed more-stringent effluent limits for zinc.

In its draft CWA Section 401 certification, the State of Idaho specified effluent limits for cadmium and lead. The certification states that these limits are necessary to ensure compliance with IDAPA 58.01.02.055.04. Because the State of Idaho's 2010 integrated reported lists the Spokane River as a high priority for TMDL development, IDAPA 58.01.02.055.04 requires that the loading of pollutants causing water quality impairments remains constant or decreases within the watershed. The limits specified by the State of Idaho will ensure that the City of Coeur d'Alene's loading of cadmium and lead remains constant or decreases. NPDES permits issued by the EPA must incorporate the requirements specified in a CWA Section 401 certification (40 CFR 122.44(d)(3), 124.53(e), 124.55(a)(2)). Therefore, the draft permit includes the cadmium and lead limits specified in the draft CWA Section 401 certification. The effluent loading limits for cadmium and lead that are based on the draft CWA Section 401 certification are stated in the draft permit in Table 3

The draft CWA Section 401 certification states that Coeur d'Alene may increase its effluent load of cadmium and lead in excess of the effluent limits specified in the draft certification (in Table 3 of the draft permit) if, prior to the discharge of an increased load, an offset plan is developed by

the City of Coeur d'Alene and approved by IDEQ. Therefore, the draft permit includes a provision allowing the City to demonstrate compliance with the cadmium and lead limits by subtracting the amount of loading specified in an IDEQ-approved offset plan when reporting their loading on their DMRs.

Because the discharge does not have the reasonable potential to cause or contribute to excursions above water quality standards for cadmium or lead, the CWA and federal regulations would not independently require effluent limits for cadmium; limits for cadmium and lead are required only by IDAPA 58.01.02.055.04 and by the State's draft certification. Therefore there are no effluent limits for cadmium or lead in Table 4 of the draft permit, however, there are monitoring and reporting requirements.

The EPA is specifically requesting comments on the effluent loading (i.e., lb/day) limits for cadmium, lead, and zinc, as well as the concentration (i.e., µg/L) limits for zinc. A more detailed discussion of the effluent limits for cadmium, lead, and zinc is provided in Appendix C.

Temperature (Idaho)

The fact sheet dated February 16, 2007 stated that the Spokane River was listed in Idaho's 2002/2004 303(d)/305(b) integrated report as being impaired for temperature. The Spokane River is not listed for temperature in Idaho's 2010 integrated report. The 1999 permit did not include effluent limits for temperature. When developing the 2007 draft permit, the EPA determined that the discharge did not have the reasonable potential to cause or contribute to excursions above water quality standards for temperature, and no temperature effluent limits were proposed in the 2007 draft permit. In developing the revised draft permit, the EPA re-evaluated the need for effluent limits for temperature and has once again determined that the discharge does not have the reasonable potential to cause or contribute to excursions above water quality standards for temperature; therefore, no effluent limits are proposed for temperature in the revised draft permit.

The finding that the discharge does not have the reasonable potential to cause or contribute to excursions above Idaho's water quality standards for temperature has not changed since the 2007 draft permit was issued for public review and is not one of the substantial new questions that caused the reopening of the comment period.

Dissolved Oxygen (Washington)

In the fact sheets dated February 16, 2007 for the Cities of Coeur d'Alene and Post Falls and the Hayden Area Regional Sewer Board, the EPA made a finding that the discharges of oxygen-demanding pollution from those sources have the reasonable potential to cause or contribute to excursions below Washington's water quality criterion for dissolved oxygen in Lake Spokane. The draft permits issued for public review and comment in February 2007 therefore included water quality-based effluent limits for phosphorus, $CBOD_5$, and ammonia, which were intended to ensure compliance with Washington's water quality criterion for dissolved oxygen in lakes and reservoirs, as required by federal regulations (40 CFR 122.4(d), 122.44(d)(4), see also CWA Section 401(a)(2)). The "reasonable potential" finding (which determines whether or not water quality-based effluent limits based upon Washington water quality standards are necessary for oxygen-demanding pollutants, see 40 CFR 122.44(d)(1)(i – iii)) remains valid.

However, comments received during the 2007 public comment period regarding the calculation of phosphorus, ammonia, and $CBOD_5$ limits led the EPA to re-evaluate the effluent limits for these parameters. Commenters stated that the effluent limits should be calculated based on the cumulative dissolved oxygen impact of all human actions. Furthermore, in February 2008, after the close of the initial public comment period, the EPA approved revisions to Washington's water quality standards, which made those revised standards effective for Clean Water Act purposes, including NPDES permits (40 CFR 131.21). Among the changes to Washington's water quality standards was a change to the water quality criterion for dissolved oxygen (DO) in lakes and reservoirs. At the time of the initial public comment period in 2007, the water quality criterion for DO in lakes and reservoirs that was in effect for Clean Water Act purposes read "no measurable decrease from natural conditions" (WAC 173-201A-030(5)(c)(ii), 1997). The revised standard reads "for lakes, human actions considered cumulatively may not decrease the dissolved oxygen concentration more than 0.2 mg/L below natural conditions" (WAC 173-201A-200(1)(d)(ii), 2006). The significant differences between the old and current criteria are that the allowable amount of DO decrease relative to the natural condition is now numeric (0.2 mg/L) instead of a narrative statement ("no measurable decrease"), and the current criterion states that this allowable DO decrease is based on the cumulative impact of human actions.

In addition, the State of Washington has prepared and the EPA has approved the *Spokane River and Lake Spokane Dissolved Oxygen Total Maximum Daily Load: Water Quality Improvement Report*, dated February 2010 and hereinafter referred to as the Spokane DO TMDL. In the Spokane DO TMDL, the State of Washington made specific assumptions about the amounts of oxygen-demanding pollution that will be discharged by sources in Idaho.

In light of the comments received during the initial comment period, the changes to the Washington water quality standards, and the availability of the Spokane DO TMDL, the EPA has determined that the effluent limits for phosphorus, ammonia and $CBOD_5$ proposed in the 2007 draft permit should be changed in order to ensure compliance with Washington's dissolved oxygen criterion for lakes and reservoirs.

Therefore, the EPA has proposed revised water quality-based effluent limitations for phosphorus, ammonia, and five-day carbonaceous biochemical oxygen demand in the City of Coeur d'Alene draft permit. These effluent limits ensure 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 (40 CFR 122.44(d)(1)(vii)(A)). The effluent limits are based on the cumulative impact of all human actions that affect dissolved oxygen concentrations in Lake Spokane. See Appendix B for a complete explanation of the water quality-based phosphorus, ammonia, and $CBOD_5$ effluent limits in the draft permit, that are based on Washington water quality standards for dissolved oxygen. The EPA is specifically requesting public comments on all of the water quality-based effluent limits in the draft permit that are derived from Washington's water quality standards.

Metals (Washington)

The segment of the Spokane River immediately downstream from the State line is listed in Washington's 2008 303(d)/305(b) integrated report for cadmium, lead, and zinc. The listing category for these metals is 4A, which means that a TMDL has been prepared for these pollutants. The *Spokane River Dissolved Metals Total Maximum Daily Load* (Butkus and Merrill, 1999) was approved by the EPA on August 25, 1999.

As stated in the fact sheet dated February 16, 2007, the EPA has determined that the City's discharge does not have the reasonable potential to cause or contribute to excursions above Washington's water quality standards for cadmium, lead or zinc. The finding that the discharge does not have the reasonable potential to cause or contribute to excursions above Washington's water quality standards for cadmium, lead, or zinc has not changed since the 2007 draft permit was issued for public review and is not one of the substantial new questions that caused the reopening of the comment period.

Temperature (Washington)

The segment of the Spokane River immediately downstream from the State line is listed in Washington's 2008 303(d)/305(b) integrated report as not attaining or not being expected to attain water quality standards for temperature. As explained in Appendix B, the EPA has determined that the discharges from Idaho point sources do not have the reasonable potential to cause or contribute to excursions above Washington's water quality standards for temperature.

The finding that the discharge does not have the reasonable potential to cause or contribute to excursions above Washington's water quality standards for temperature has not changed since the 2007 draft permit was issued for public review and is not one of the substantial new questions that caused the reopening of the comment period.

Total Polychlorinated Biphenyls and Dioxin (Washington)

The Spokane River is listed in Washington's 2008 303(d)/305(b) integrated report as not attaining or not being expected to attain water quality standards for total polychlorinated biphenyls (PCBs), due to elevated concentrations in fish tissue. The Spokane Tribe of Indians has EPA-approved water quality standards for its waters, which are downstream of the Long Lake Dam, and data from lower Lake Spokane indicate that the Tribe's water quality criterion for PCBs (in the water column) is not being attained (Serdar et al. 2011). The Spokane River is also listed in Washington's 2008 303(d)/305(b) integrated report as not attaining or not being expected to attain water quality standards for 2,3,7,8 tetrachlorodibenzo-p-dioxin (2,3,7,8 TCDD), due to elevated concentrations in fish tissue.

As stated in the fact sheet dated February 16, 2007, currently, there are insufficient data to determine if the discharges from point sources to the Spokane River in Idaho have the reasonable potential to cause or contribute to excursions above water quality standards for PCBs in waters of the State of Washington or the Spokane Tribe of Indians. There are also insufficient data to determine if the discharges from point sources to the Spokane River in Idaho have the reasonable potential to cause or contribute to excursions above water quality standards for 2,3,7,8 TCDD. Therefore, no numeric water quality-based effluent limits are proposed for PCBs or 2,3,7,8 TCDD in the draft permit.

The draft permits for the Cities of Post Falls and Coeur d'Alene and the Hayden Area Regional Sewer Board propose influent, effluent and surface water column monitoring for PCBs. These data will be used to determine if the discharges have the reasonable potential to cause or contribute to excursions above water quality standards for PCBs in waters of the State of Idaho, the State of Washington or the Spokane Tribe of Indians. Monitoring requirements for PCBs are discussed in more detail in Section VI.D below.

The permits propose quarterly influent and effluent monitoring for 2,3,7,8 TCDD. The permits do not propose surface water monitoring for 2,3,7,8 TCDD because the detection limit of EPA Method 1613B (4.4 picograms per liter) is much greater than the water quality criterion for 2,3,7,8 TCDD that is currently in effect for Clean Water Act purposes in Idaho (0.013 picograms per liter) (EPA 1994). Thus, surface water monitoring for 2,3,7,8 TCDD using Method 1613B would be unlikely to yield meaningful data.

The NPDES permits for municipal separate storm sewer systems that discharge pollutants to the Spokane River in Idaho also include monitoring requirements for PCBs.

The average total PCB concentration at the Washington – Idaho border is 106 picograms per liter (pg/L) (Serdar et al. 2011). This concentration is 38% less than Washington's and Idaho's water quality criteria for total PCBs (170 pg/L) that are in effect under the CWA.[1] The Spokane Tribe's water quality criterion for PCBs is 3.37 pg/L. Furthermore, in 1999, the USGS performed sampling of fish tissue in Idaho at station #12419000 (Spokane River near Post Falls, Idaho). The concentration of PCBs measured in fish collected from this station was 270 µg/kg (USGS 2003). The 170 pg/L Clean Water Act effective water column criterion for PCBs in Idaho and Washington corresponds to a fish tissue concentration of 5.3 µg/kg.[2,3] Since the measured fish tissue concentration is greater than the fish tissue that corresponds to the criterion, the measured fish tissue concentration indicates elevated levels of PCBs.

PCBs have been detected in effluent from POTWs discharging to the Spokane River in the State of Washington (i.e., the City of Spokane and the Liberty Lake Sewer and Water District) as well as other POTWs in Washington State operated by the Cities of Medical Lake, Okanogan, College Place, Walla Walla, Pullman, Colfax, Albion, Bremerton, Tacoma, and Everett, and King and Pierce counties. Effluent concentrations of total PCBs at these 14 facilities (a total of 34 samples) ranged from 46.6 to 39,785 pg/L with a median concentration of 810 pg/L, and 82% of the results (28 out of 34) were greater than Idaho's and Washington's Clean Water Act effective water quality criterion of 170 pg/L (Coots and Deligeannis 2010; Ecology 2010; Johnson et al. 2004; Serdar 2003; Serdar et al. 2011; personal communication with Richard Koch, Ecology, September 8, 2011). Design flows of these POTWs range from 0.54 mgd (Okanogan) to 215 mgd (King County West Point). PCBs were also detected in 96% of samples (69 out of 72) of effluents collected from 18 POTWs discharging to the Yakima River in central Washington State in 2007 and 2008. The median effluent concentration of total PCBs at these 18 POTWs was 370 pg/L and the maximum concentration was 7,400 pg/L; 82% of the samples (59 out of 72) exceeded Washington's water quality criterion of 170 pg/L (Johnson et al. 2010).

The fact that the average concentration of PCBs at the State line is more than half the value of the water quality criterion that is in effect under the Clean Water Act in Washington and Idaho and that high concentrations of PCBs have been measured in fish tissue in the Spokane River in

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[1] Idaho's PCB water quality criterion that is in effect under State law is 64 pg/L. However, EPA has not yet taken an approval or disapproval action on this criterion and therefore it is not in effect for Clean Water Act purposes. (See 40 CFR 131.21(c)(2))

[2] The PCB water quality criterion that is in effect under State law in Idaho is equivalent to a fish tissue concentration of 2.0 µg/kg.

[3] The bioconcentration factor (BCF) is the ratio of a substance's concentration in tissue versus its concentration in water, in situations where the food chain is not exposed or contaminated. For non-metabolized substances, it represents equilibrium partitioning between water and organisms. The BCF for PCBs is 31,200 L/kg (EPA 2002). Multiplying the BCF by the water column criterion yields the equivalent fish tissue concentration.

Idaho, in addition to the frequent detection of PCBs at concentrations above water quality criteria in other POTWs as described above, suggests that pollution sources in Idaho may be contributing to exceedances of water quality criteria for PCBs.

Moreover, 2,3,7,8 TCDD has been detected in the effluent from the City of Medical Lake wastewater treatment plant (1.85 mgd design flow) in Washington State at a concentration of 0.56 pg/L, which is 43 times the criterion that is in effect for Clean Water Act purposes in both Idaho and Washington, which is 0.013 pg/L (Coots and Deligeannis 2010).[4] According to data obtained from EPA's Envirofacts database, 2,3,7,8 TCDD has also been detected in the effluents from seven POTWs in Arizona, California and Florida. The median concentration of 2,3,7,8 TCDD among 36 samples from those seven POTWs was 1.05 pg/L, which is 81 times the criterion (Nickel 2011). Design flows of the Arizona, California, and Florida POTWs with 2,3,7,8 TCDD effluent data range from 2.2 to 37 mgd.

Studies in the 1990s found mixtures of dioxins and furans in POTW effluents of 0.27 to 0.81 toxicity equivalents (TEQ)[5] (EPA 2006). Potential sources of dioxins and furans in POTW discharges include laundry wastewater, particularly from clothing dyes and pigments containing dioxins and furans and from cotton treated with pentachlorophenol (which is used in some developing countries), runoff from streets with high traffic density, and industrial sources such as metal manufacturing (EPA 2006). This information suggests that point sources in Idaho may also be contributing to excursions above water quality standards for 2,3,7,8 TCDD in waters of the State of Washington.

Therefore, although it is not known at this time which specific sources contribute PCBs or 2,3,7,8 TCDD to the Spokane River in Idaho, the EPA believes that, similar to POTWs in the State of Washington and elsewhere, the Idaho POTWs may be discharging PCBs and 2,3,7,8 TCDD, and that best management practices (BMP) requirements to control or abate the discharge of PCBs and 2,3,7,8 TCDD are reasonably necessary to carry out the purposes and intent of the Clean Water Act. Due to the lack of data, it is infeasible to calculate numeric water quality-based effluent limits for PCBs and 2,3,7,8 TCDD at this time. Therefore, the draft permit includes BMP requirements for PCBs and 2,3,7,8 TCDD, consistent with 40 CFR 122.44(k)(3) and (4). The BMP requirements are in Part II.I of the draft permit.

The draft permit also requires the permittee to participate in the Spokane River Regional Toxics Task Force (SRRTTF). See the draft permit at Part II.H.

The EPA is specifically requesting comments on the monitoring and BMP requirements for PCBs and 2,3,7,8 TCDD and the requirement to participate in the SRRTTF.

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[4] Idaho's 2,3,7,8 TCDD water quality criterion that is in effect under State law is 0.005 pg/L. However, EPA has not yet taken an approval or disapproval action on this criterion and therefore it is not in effect for Clean Water Act purposes. (See 40 CFR 131.21(c)(2))

[5] The TEQ procedure translates the complex mixture of dioxins and furans characteristic of environmental releases into an equivalent toxicity concentration of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD), the most toxic member of this class of compounds.

V. Effluent Limitations

A. Basis for Effluent Limitations

In general, the Clean Water Act (Act) 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 of a waterbody are being met and may be more stringent than technology-based effluent limits. The bases for the proposed effluent limits in the draft permit are provided in Appendices B, C, D, E, F, and G.

B. Proposed Effluent Limitations

Below are the proposed effluent limits that are in the draft permit (see Part I.B).

1. Removal Requirements for $CBOD_5$ and TSS: The monthly average effluent concentration must not exceed 15 percent of the monthly average influent concentration. Percent removal of $CBOD_5$ and TSS must be reported on the Discharge Monitoring Reports (DMRs). For each parameter, the monthly average percent removal must be calculated from the arithmetic mean of the influent values and the arithmetic mean of the effluent values for that month. Influent and effluent samples must be taken over approximately the same time period.
2. The permittee must not discharge floating, suspended or submerged matter of any kind in concentrations causing nuisance or objectionable conditions or that may impair designated beneficial uses.

Table 2 (below) presents the proposed final seasonal average, average monthly, average weekly, maximum daily, and instantaneous maximum effluent limits. Limits that are different from those in the 2007 draft permit are shown in italic type. The EPA is specifically requesting public comments on all of these revised effluent limits.

C. Schedules of Compliance

Schedules of compliance are authorized by federal NPDES regulations at 40 CFR 122.47 and by Section 400.03 of the Idaho Water Quality Standards. The Idaho water quality standards allow for compliance schedules "when new limitations are in the permit for the first time." The federal regulation allows schedules of compliance "when appropriate," and requires that such schedules require compliance as soon as possible. When the compliance schedule is longer than 1 year, federal regulations require that the schedule shall set forth interim requirements and the dates for their achievement. The time between the interim dates shall generally not exceed 1 year, and when the time necessary to complete any interim requirement is more than one year, the schedule shall require reports on progress toward completion of these interim requirements. Federal regulations also generally require that interim effluent limits be at least as stringent as the final limits in the previous permit (40 CFR 122.44(l)(1)).

Table 2: Proposed Final Effluent Limits				
Parameter	**Units**	**Effluent Limits**		
		Average Monthly Limit	**Average Weekly Limit**	**Maximum Daily Limit**
Five-Day Carbonaceous Biochemical Oxygen Demand ($CBOD_5$) *November – January*	mg/L	25	40	—
	lb/day	1251	2002	—
	% removal	85% (minimum)	—	—
$CBOD_5$ *February – March*	mg/L	*25*	*40*	—
	lb/day	*295*	*472*	—
	% removal	85% (minimum)	—	—
$CBOD_5$ *April - October*	mg/L	*25*	*40*	—
	lb/day	*265*	*424*	—
	% removal	85% (minimum)	—	—
Total Suspended Solids (TSS)	mg/L	30	45	—
	lb/day	1501	2252	—
	% removal	85% (minimum)	—	—
pH October – June	s.u.	*6.3 – 9.0*		
pH July – September	s.u.	*6.5 – 9.0*		
Total Phosphorus as P[2] (Feb. – Oct.)	lb/day	*Seasonal Average Limit: 3.17 lb/day*		
E. Coli Bacteria	#/100 ml	126 (geometric mean)	—	406 (single sample maximum)
Total Residual Chlorine July – September	µg/L	39	—	102
	lb/day	2.0	—	5.1
Total Residual Chlorine October – June	µg/L	150	—	390
	lb/day	7.5	—	20
Total Ammonia as N[2] March – June	lb/day	*649*	—	*1547*
Total Ammonia as N[2] July – September	mg/L	*6.59*	—	*15.7*
	lb/day	*330*	—	*786*
Total Ammonia as N October	lb/day	*525*	—	*1252*
Total Ammonia as N[2] March – October	lb/day	*272 seasonal average*		
Silver October – June, effluent flow > 4.2 mgd	µg/L	*8.01*	—	*22.5*
	lb/day	*0.401*	—	*1.13*
Cadmium (Based on the State of Idaho's draft CWA Section 401 certification. See the draft permit at Table 3.)	lb/day	*0.0075*	*0.0094*	—
Lead (Based on the CWA and federal regulations. See the draft permit at Table 4.)	µg/L and lb/day	—	—	—
Lead (Based on the State of Idaho's draft CWA Section 401 certification. See the draft permit at Table 3.)	lb/day	*0.13*	—	*0.29*
Lead (Based on the CWA and federal regulations. See the draft permit at Table 4.)	µg/L and lb/day	—	—	—
Zinc	µg/L	*135*	—	168
	lb/day	*6.76*	—	8.42

Table 2: Proposed Final Effluent Limits				
Parameter	**Units**	**Effluent Limits**		
		Average Monthly Limit	**Average Weekly Limit**	**Maximum Daily Limit**
Notes: 1. No single sample may exceed 406 organisms per 100 ml (instantaneous maximum limit). 2. These effluent limits are subject to a compliance schedule. Until the final effluent limits become effective, the permittee must comply with interim effluent limitations (see Table 3, below). 3. The monthly geometric mean concentration of E. coli must not exceed 126 organisms per 100 ml.				

EPA policy states that, in order to grant a compliance schedule, a permitting authority must make a reasonable finding that the permittee cannot comply with the effluent limit immediately upon the effective date of the final permit (see memorandum from Jim Hanlon to Alexis Strauss, May 10, 2007). Some of the proposed effluent limits for phosphorus, $CBOD_5$, ammonia, cadmium, lead, zinc, and silver are new limits that are in the permit for the first time. However, the EPA has determined that the permittee can, in fact, comply with all of these effluent limits, except phosphorus and, in some cases, ammonia, immediately upon the effective date of the final permit, as explained in Appendix G.

Therefore, compliance schedules are proposed only for phosphorus and ammonia (except for the average monthly and maximum daily ammonia limits in effect during October). The compliance schedules include interim effluent limitations, as shown in Table 3, below. The interim phosphorus limits retain the average monthly 1 mg/L effluent limit from the 1999 permit, in order to ensure compliance with 40 CFR 122.44(l)(1). In order to ensure compliance with 40 CFR 122.45(f), which requires that effluent limits are expressed in terms of mass, the EPA has calculated interim mass effluent limits for phosphorus, which apply in addition to the concentration limits. The interim monthly average mass limit is equal to the mass loading of phosphorus that the permittee could have discharged, at the POTW's design flow rate, while maintaining compliance with the concentration effluent limit in the 1999 permit. Federal regulations require that effluent limits for POTWs be calculated based on the design flow of the POTW (40 CFR 122.45(b)(1)). In order to ensure compliance with 40 CFR 122.45(d), which requires that effluent limits for POTWs shall generally be expressed as average weekly and average monthly discharge limitations, the EPA has included an interim average weekly mass limit for phosphorus, which is equal to the average monthly limit multiplied by 1.6, which is the same ratio as the technology-based effluent limits for $CBOD_5$. This accounts for effluent variability within a month.

The interim ammonia limits are identical to the ammonia limits in the 1999 final permit, in compliance with 40 CFR 122.44(l)(1).

The compliance schedules are based on the draft Clean Water Act Section 401 certification provided to the EPA by the Idaho Department of Environmental Quality. The final permit will contain compliance schedules consistent with the State of Idaho's final Clean Water Act Section 401 certification, which may differ from the draft certification. The EPA believes that the compliance schedule proposed for phosphorus complies with the regulatory requirement that compliance be achieved "as soon as possible" (40 CFR 122.47(a)(1)), as explained in Appendix G.

Table 3: Interim Effluent Limits				
Parameter	**Units**	**Effluent Limits**		
		Average Monthly Limit	**Average Weekly Limit**	**Maximum Daily Limit**
Total Ammonia as N July – September Effluent flow ≤ 4.2 mgd	mg/L	10	—	29
	lb/day	350	—	1000
Total Ammonia as N July – September Effluent flow > 4.2 mgd	mg/L	7.4	—	21
	lb/day	370	—	1100
Total Phosphorus as P February – October	mg/L	1.0	1.6	—
	lb/day	50	80	—

Because the compliance schedules are authorized by the State of Idaho in the Section 401 certification, comments on the compliance schedules should be directed to the Idaho Department of Environmental Quality at the address listed on the front page of this Fact Sheet and in the public notice of the availability of this draft permit, in addition to the EPA.

D. Total Residual Chlorine Compliance Evaluation Level

The 2007 draft permit contained a compliance evaluation level of 100 µg/L (0.1 mg/L) for total residual chlorine. This compliance evaluation level was based on the minimum level (ML) of chlorine analytical methods that are no longer approved for use in NPDES permitting (see 40 CFR 136).

Currently approved methods can quantify chlorine at a concentration of 50 µg/L. With the exception of the average monthly chlorine limit in effect from July – September, the proposed effluent limits for total residual chlorine are greater than the concentrations that can be quantified using approved analytical methods for chlorine. Thus, the compliance evaluation level for the July – September total residual chlorine limits has been changed to 50 µg/L from 100 µg/L.

The EPA is specifically requesting comments on the change to the total residual chlorine compliance evaluation level.

E. Basis for Substitution of E. coli Limits for Fecal Coliform Limits

The draft permit proposes effluent limits for E. coli in lieu of the 1999 permit's fecal coliform limits. The basis for this change is explained in the fact sheet dated February 16, 2007. The proposed substitution of E. coli for the 1999 permit's fecal coliform limits is unchanged from the draft permit issued for public review in 2007 and is not one of the substantial new questions that caused the EPA to reopen the public comment period and is included here for the purpose of providing background context. Therefore, the EPA is not requesting comments on the E. coli limits at this time.

VI. Monitoring Requirements

A. Basis for Effluent and Surface Water Monitoring

Section 308 of the CWA and the federal regulation 40 CFR 122.44(i) require monitoring in permits to determine compliance with effluent limitations. Monitoring may also be required to gather effluent and surface water data to determine if additional effluent limitations are required and/or to monitor effluent impacts on receiving water quality. The permittee is responsible for conducting the monitoring and for reporting results on Discharge Monitoring Reports (DMRs) or on the application for renewal, as appropriate, to the EPA.

B. Effluent Monitoring

In general, the basis for the effluent monitoring requirements in the draft permit was explained in the fact sheet dated February 16, 2007. Some changes to the effluent monitoring requirements are proposed, as explained below. The proposed effluent monitoring requirements are shown in Table 4, below.

Whole Effluent Toxicity

The whole effluent toxicity (WET) testing requirements have been expanded to include a requirement to prepare an initial investigation toxicity reduction evaluation (TRE) plan, a requirement to conduct accelerated testing in the event of an excursion above a trigger value (which is based on the dilution of the effluent in the receiving water at the edge of the authorized mixing zone) and a requirement to conduct a TRE if an additional excursion above the trigger occurs during accelerated testing. These requirements are consistent with the recommendations of the EPA *Regions 9 and 10 Guidance for Implementing Whole Effluent Toxicity Testing Programs* (EPA 1996b). These requirements were included in the 1999 permit, but were omitted from the 2007 draft permit.

In addition, the revised draft permit proposes a semi-annual (twice per year) monitoring frequency for WET, which is the same as the 1999 permit. The 2007 draft permit had proposed annual (once per year) monitoring for WET, however, there is no basis to reduce the WET monitoring frequency relative to the 1999 permit. Finally, in the draft permit, the EPA is proposing to require the permittee to use three organisms for toxicity testing (a fish, an invertebrate, and a plant), consistent with the recommendations of the *Regions 9 and 10 Guidance for Implementing Whole Effluent Toxicity Testing Programs* (Page 2-18) and the *Technical Support Document for Water Quality-based Toxics Control* (Section 3.3.3). The 2007 draft permit only required testing of a fish and an invertebrate.

The EPA is specifically requesting public comment on the revised WET testing requirements.

Total Residual Chlorine

In the 2007 draft permit, the EPA had proposed to reduce the monitoring frequency for total residual chlorine from three times per day in the 1999 permit to five times per week from July – October and once per week from October - June. However, the EPA has determined that reducing the total residual chlorine monitoring frequency to this extent would not be consistent with the EPA's *Interim Guidance for Performance - Based Reductions of NPDES Permit Monitoring Frequencies* (EPA 1996a).

The average effluent concentration of total residual chlorine is 28 µg/L, which is 18% of the proposed average monthly effluent limit for October – June and 69% of the average monthly effluent limit for July – September. The *Interim Guidance for Performance - Based Reductions of NPDES Permit Monitoring Frequencies* does not discuss monitoring reduction for a baseline frequency of three samples per day, so the EPA has applied the recommendations of the guidance for three times per week sampling to the three samples per day sampling frequency that was required in the 1999 permit. This results in a reduction in sampling frequency for October – June to once per day, and no reduction in sampling frequency for July – September.

Permit Application Monitoring

The draft permit proposes to require all of the monitoring that would be necessary to produce a complete application for renewal of this permit. Effluent monitoring required by Part B.6 of application form 2A (which is required of all facilities with a design flow greater than or equal to 0.1 mgd) is required at a frequency of quarterly for oil and grease and total dissolved solids, and monthly for forms of nitrogen and phosphorus that are not subject to effluent limits. More frequent monitoring is required for nitrogen and phosphorus species because these are nutrients, and nutrients are known to contribute to water quality impairments in this watershed (i.e., for dissolved oxygen in the State of Washington and total phosphorus in the State of Idaho).

Effluent monitoring required by Part D of application form 2A, which is not required by other provisions of this permit, is required at the minimum frequency required by the application (three samples over the term of the permit.

Table 4: Effluent Monitoring Requirements

Parameter	Unit	Sample Location	Sample Frequency	Sample Type
Flow	mgd	Effluent	Continuous	Recording
$CBOD_5$ November – January	mg/L	Influent and Effluent	1/week	24-hour composite
	lbs/day	Influent and Effluent		calculation[1]
	% Removal	--	1/month	calculation[2]
$CBOD_5$ February – October	mg/L	Influent and Effluent	3/week	24-hour composite
	lbs/day	Influent and Effluent		calculation[1]
	% Removal	--	1/month	calculation[2]
TSS	mg/L	Influent and Effluent	1/week	24-hour composite
	lbs/day	Influent and Effluent		calculation[1]
	% Removal	--	1/month	calculation[2]
pH	standard units	Effluent	5/week	grab
E. Coli Bacteria	#/100 ml	Effluent	5/month	grab
Total Residual Chlorine (July – September)	µg/L	Effluent	3/day	grab
	lb/day			calculation
Total Residual Chlorine (October – June)	µg/L	Effluent	1/day	grab
	lb/day			calculation
Total Ammonia as N (Mar. – Oct.)	mg/L	Effluent	3/week	24-hour composite
	lb/day			calculation
Total Ammonia as N (Nov. – Feb.)	mg/L	Effluent	1/month	24-hour composite
Total Phosphorus February – October	µg/L	Effluent	3/week	24-hour composite
	lb/day			calculation
Total Phosphorus November – January	µg/L	Effluent	1/week	24-hour composite
Cadmium	µg/L	Effluent	1/month	24-hour composite

Table 4: Effluent Monitoring Requirements				
Parameter	**Unit**	**Sample Location**	**Sample Frequency**	**Sample Type**
	lb/day			calculation
Lead	µg/L	Effluent	1/month	24-hour composite
	lb/day			calculation
Zinc	µg/L	Effluent	1/month	24-hour composite
	lb/day			calculation
Temperature	ºC	Effluent	5/week	grab
Copper	µg/L	Effluent	1/month	24-hour composite
Silver	µg/L	Effluent	1/month	24-hour composite
Alkalinity	mg/L as $CaCO_3$	Effluent	1/month	24-hour composite
Hardness	mg/L as $CaCO_3$	Effluent	1/month	24-hour composite
Oil and Grease	mg/L	Effluent	1/quarter	grab
Total Dissolved Solids	mg/L	Effluent	1/quarter	24-hour composite
Polychlorinated Biphenyl (PCB) Congeners	pg/L	Influent	1/2 months	24-hour composite
PCB Congeners	pg/L	Effluent	1/quarter	24-hour composite
2,3,7,8 Tetrachlorodibenzo-p-dioxin	pg/L	Influent and Effluent	1/quarter	24-hour composite
Orthophosphate as P	mg/L	Effluent	1/month	24-hour composite
Total Kjeldahl Nitrogen	mg/L	Effluent	1/month	24-hour composite
Nitrate plus Nitrite Nitrogen	mg/L	Effluent	1/month	24-hour composite
Dissolved Oxygen	mg/L	Effluent	1/month	grab
NPDES Application Form 2A Expanded Effluent Testing	---	Effluent	3x/5years	---
Whole Effluent Toxicity	TU_c	Effluent	2/year	24-hour composite

Notes:
1. Maximum daily loading is calculated by multiplying the concentration in mg/L by the average daily flow in mgd and a conversion factor of 8.34.
2. Percent removal is calculated using the following equation:
(average monthly influent - effluent) ÷ average monthly influent.

C. Surface Water Monitoring

The EPA received comments during the 2007 public comment period regarding the surface water monitoring requirements. Commenters stated that the 2007 draft permit proposed to require surface water monitoring at locations that are outside the influence or control of the dischargers performing the sampling, and that sampling should instead be required exclusively upstream and downstream of each discharger's outfall.

The EPA agrees that surface water monitoring upstream and downstream of each discharger's outfall would adequately characterize the dischargers' effect on water quality in the Spokane River. The EPA therefore proposes to change the surface water monitoring requirements such that the permit requires surface water monitoring upstream and downstream of each discharger's outfall.

Commenters also stated that the permit should not require surface water monitoring in Skalan Creek. Commenters stated that access to the mouth of the creek (the proposed required sampling point in the 2007 draft permit) required access to private property that could not be assured, and

that the creek does not flow for much of the year. Given the lack of reliable access to the mouth of Skalan Creek, the fact that the creek does not flow for much of the year, and the fact that the Spokane River discharges have no influence upon water quality in Skalan Creek, the EPA has deleted the surface water monitoring requirements for Skalan Creek from the draft permit. The EPA is specifically requesting public comment on the revised surface water monitoring requirements in the draft permit.

Table 5: Surface Water Monitoring Requirements

Parameter (units)	Sample Locations	Sample Frequency	Sample Type	Maximum ML
$CBOD_5$	Upstream and Downstream	8/year[1]	Grab	---
Total Ammonia as N (mg/L)	Upstream and Downstream	8/year[1]	Grab	0.05 mg/L
pH (standard units)	Upstream and Downstream	8/year[1]	Grab	---
Total Nitrogen (mg/L)	Upstream and Downstream	8/year[1]	Grab	0.05 mg/L
Total Phosphorus as P (µg/L)	Upstream and Downstream	8/year[1]	Grab	5 µg/L
Orthophosphate as P (µg/L)	Upstream and Downstream	8/year[1]	Grab	5 µg/L
Dissolved Oxygen (mg/L)	Upstream and Downstream	8/year[1]	Grab	---
Chlorophyll a	Upstream and Downstream	8/year[1]	Grab	---
PCB Congeners	Upstream and Downstream	2/year[2]	Grab	10 pg/L (MDL)

Notes:
1. The permittee must sample the receiving water at least twice per month during the months of July, August, September, and October.
2. The permittee must sample the receiving water at least once during the season of April 1 – June 30 and at least once during the season of July 1 – September 30.

D. Monitoring Requirements for PCBs

The draft permits for the Cities of Post Falls and Coeur d'Alene and the Hayden Area Regional Sewer Board propose bi-monthly influent and quarterly effluent monitoring for PCB congeners. These monitoring frequencies are the same as required in the State of Washington's permit for the Liberty Lake Sewer and Water District.

The draft permits also propose twice yearly surface water column monitoring upstream and downstream of the outfall for PCB congeners. The surface water column monitoring is required because there are very little data available for PCB concentrations in the Spokane River in Idaho. To reduce duplication of effort, the permit allows surface water monitoring performed by or for the SRRTTF to be used to fulfill permit requirements, if such monitoring would otherwise meet the requirements of the permit.

These data will be used to determine if the discharges have the reasonable potential to cause or contribute to excursions above water quality standards for PCBs in waters of the State of Idaho, the State of Washington or the Spokane Tribe of Indians and to evaluate the effectiveness of the toxics management plan.

The permit specifies the analytical methods and maximum detection limits that must be used for analysis of PCB congeners and 2,3,7,8 TCDD. In general, the draft permit requires the use of EPA Method 1668 for PCB monitoring because it is the most sensitive method available, and it analyzes for all 209 of the individual PCB congeners. However, EPA method 8082 may be used for influent and effluent monitoring (but not receiving water monitoring), if initial screening with method 1668 shows that influent and/or effluent PCB concentrations are high enough that method 8082 could accurately quantify the PCB concentrations at those location(s).

Federal regulations require that, to assure compliance with permit limitations, permits must include requirements to monitor "according to procedures approved under 40 CFR Part 136," unless another method is required by 40 CFR Parts 400 – 471, 501, or 503 (i.e. pretreatment requirements, effluent limit guidelines, or sewage sludge requirements). See 40 CFR 122.44(i)(1)(iv).

EPA methods 1668 and 8082 are not approved methods under 40 CFR Part 136, thus, if effluent limits for total PCBs are established in the future, methods 1668 or 8082 could not be used to determine compliance with such effluent limits unless those methods are approved under 40 CFR 136 for either nationwide or limited use at the time such limits are established. The EPA proposed to approve Method 1668 Revision C on September 23, 2010 (75 FR 58027). On May 18, 2012, the EPA chose to defer approval of Method 1668C while it considers the large number of public comments received on the proposed approval. However, the EPA noted that "this decision does not negate the merits of this method for the determination of PCB congeners in regulatory programs or for other purposes when analyses are performed by an experienced laboratory" (77 FR 29763).

The EPA may require the use of methods 1668 or 8082 in this case because the permit requires analysis of PCB congeners, and the methods approved under 40 CFR 136 are not capable of analysis for individual PCB congeners. While method 8082 cannot measure for all 209 PCB congeners, it can measure for some individual congeners. Congener analysis is appropriate in this case because it will aid in source identification, which is one of the goals of the toxics management plan requirements. For pollutants for which there are no approved methods under 40 CFR Part 136 (such as PCB congeners), monitoring must be conducted according to a test procedure specified in the permit (40 CFR 122.44(i)(1)(iv)). Therefore, the EPA has specified the use of EPA method 1668, or, if it would be adequately sensitive, 8082. Furthermore, the monitoring is being required for effluent and receiving water characterization as opposed to determining compliance with effluent limits.

VII. Sludge (Biosolids) Requirements

EPA Region 10 separates wastewater and sludge permitting. Under the CWA, the EPA has the authority to issue separate sludge-only permits for the purposes 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.

The absence of specific biosolids requirements in the draft permit is unchanged from the 2007 draft permit. This information is included here for the purpose of providing background context and is not one of the substantial new questions that caused the EPA to reopen the public comment period. Therefore the EPA is not requesting comments on the absence of specific biosolids requirements in the draft permit at this time.

VIII. Other Permit Conditions

A. Quality Assurance Plan

The quality assurance plan requirements (see the revised draft permit at Part II.C) are identical to those in the 2007 draft permit and are explained in the fact sheet dated February 16, 2007. The quality assurance plan requirements are not among the substantial new questions that caused the EPA to reopen the public comment period. The requirements are discussed here for the purpose of providing background context. Therefore the EPA is not requesting comments on the quality assurance plan requirements at this time.

B. Phosphorus Management Plan

In general, the phosphorus management plan requirements (see the revised draft permit at Part II.B) are similar to those in the 2007 draft permit. However, unlike the 2007 draft permit, the revised draft permit requires that the phosphorus management plan and implementation plan be submitted to the EPA and IDEQ, and requires annual reporting of reductions achieved through the phosphorus management plan. The phosphorus management plan requirements are effective year-round, including November – January when no numeric phosphorus limits are in place. The EPA is specifically requesting public comments on the phosphorus management plan requirements.

C. Pretreatment

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

The pretreatment requirements are not among the substantial new questions that caused the EPA to reopen the public comment period and are discussed here for the purpose of providing background context. Therefore, the EPA is not requesting comments on the pretreatment requirements at this time.

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

Untreated or partially treated discharges from separate sanitary sewer systems are referred to as sanitary sewer overflows (SSOs). SSOs may present serious risks of human exposure when released to certain areas, such as streets, private property, basements, and receiving waters used for drinking water, fishing and shellfishing, or contact recreation. Untreated sewage contains pathogens and other pollutants, which are toxic. SSOs are not authorized under this permit.

Pursuant to the NPDES regulations, discharges from separate sanitary sewer systems authorized by NPDES permits must meet effluent limitations that are based upon secondary treatment. Further, discharges must meet any more stringent effluent limitations that are established to meet State or Tribal water quality standards.

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

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

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

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

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

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

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

E. Additional Permit Provisions

Sections III, IV, and V of the draft permit contain standard regulatory language that must be included in all NPDES permits. Because they are 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 and Essential Fish Habitat

As explained in the fact sheet dated February 16, 2007, the EPA has determined that the discharge is not likely to adversely affect bull trout, and will have no effect on other threatened and endangered species (EPA 2007). In a letter dated April 5, 2007, USFWS concurred with EPA's effects determination of "not likely to adversely to affect," for bull trout.

In general, the effluent limitations in the revised draft permit are as stringent as or more stringent than those in the 2007 draft permit. Furthermore, on August 9, 2007, the bald eagle was removed from the list of threatened and endangered species. Therefore, further consultation under the Endangered Species Act is not necessary.

Essential fish habitat (EFH) is the waters and substrate (sediments, etc.) necessary for fish to spawn, breed, feed, or grow to maturity. The Magnuson-Stevens Fishery Conservation and Management Act (January 21, 1999) requires the EPA to consult with NOAA Fisheries when a proposed discharge has the potential to adversely affect EFH (i.e., reduce quality and/or quantity of EFH).

The EFH regulations define an adverse effect as any impact which reduces quality and/or quantity of EFH and may include direct (e.g. contamination or physical disruption), indirect (e.g. loss of prey, reduction in species' fecundity), site specific, or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

The EPA has determined that issuance of this permit is not likely to adversely affect EFH in the vicinity of the discharge. The Spokane River is not designated as EFH. The EPA has provided NOAA Fisheries with copies of the draft permit and fact sheet during the public notice period. Any comments received from NOAA Fisheries regarding EFH will be considered prior to reissuance of this permit.

B. State/Tribal Certification

Section 401 of the CWA requires the EPA to seek State or Tribal 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.

C. Permit Expiration

The permit will expire five years from the effective date.

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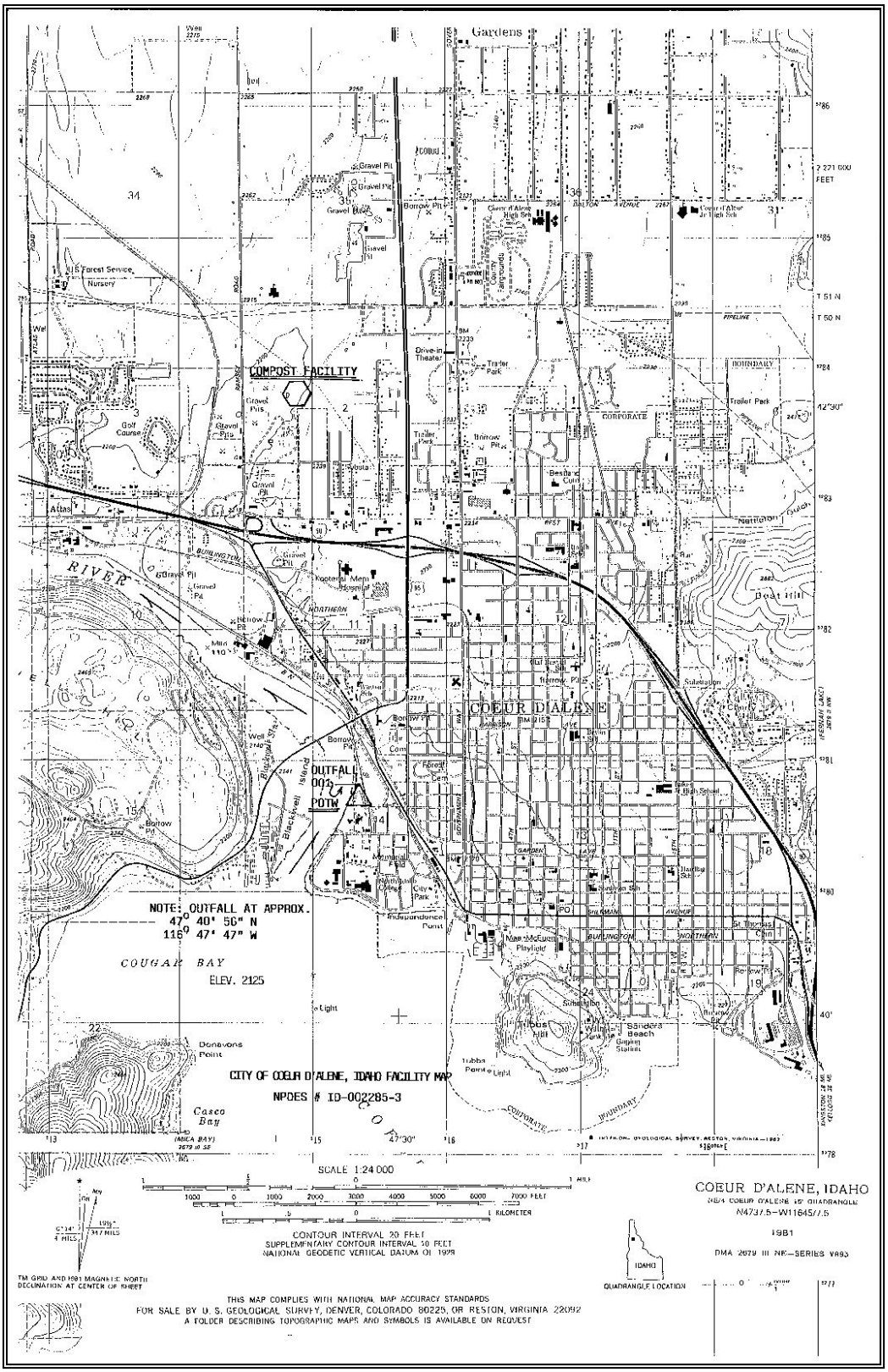
Appendix A: Facility Map



Appendix B: Water Quality-based Effluent Limits for Phosphorus, Ammonia and Carbonaceous Biochemical Oxygen Demand Necessary to Meet Water Quality Criteria for Dissolved Oxygen in Washington and Nutrients in Idaho

A. Overview

Federal regulations require NPDES permits to be conditioned to ensure compliance with the water quality requirements of all affected States (40 CFR 122.4(d), 122.44(d)(4), see also Clean Water Act Section 401(a)(2)). The EPA has determined that waters of the State of Washington are affected by discharges of nutrient and oxygen-demanding pollution, specifically total phosphorus (TP), five-day carbonaceous biochemical oxygen demand ($CBOD_5$), and total ammonia as nitrogen (ammonia), from point sources in Idaho. These three pollutants can decrease dissolved oxygen concentrations in the Spokane River and in Lake Spokane, in the State of Washington. Thus, the EPA must establish water quality-based effluent limits for these parameters, which ensure 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, including Washington water quality standards (40 CFR 122.44(d)(1)(vii)(A)). Some of the applicable water quality standards for the State of Washington explicitly require that the cumulative impact of all human actions be considered. Therefore, the effluent limits will assure that these discharges, considered cumulatively with all other human sources of pollution, including those in the State of Washington, will achieve the Washington DO standard in Lake Spokane.

B. Requirement to Meet Washington's Water Quality Standards

The federal regulation 40 CFR 122.4(d) states that "no permit may be issued…when the imposition of conditions cannot ensure compliance with the applicable water quality requirements of all affected States." In the reasonable potential analysis described below, the EPA determined that discharges of TP, $CBOD_5$, and ammonia from the City of Coeur d'Alene, the City of Post Falls and the Hayden Area Regional Sewer Board affect water quality in waters of the State of Washington, because they have the reasonable potential to cause or contribute to excursions below Washington's water quality criteria for DO. Therefore, the State of Washington is an "affected State" under 40 CFR 122.4(d).

Furthermore, 40 CFR 122.44(d)(4) requires that NPDES permits must include any requirements necessary to "conform to applicable water quality requirements under section 401(a)(2) of CWA when the discharge affects a State other than the certifying State." Therefore, the EPA must establish conditions in the permits for these facilities, which ensure compliance with the applicable water quality requirements of the State of Washington.

Reasonable Potential Analysis

The federal regulation 40 CFR 122.44(d)(1)(i), which implements Section 301(b)(1)(C) of the Clean Water Act, requires that NPDES permits contain water quality-based effluent limitations for all pollutants or pollutant parameters that the EPA determines are or may be discharged at a level that will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including narrative criteria for water quality.

In the fact sheets for the 2007 draft permits for the Cities of Coeur d'Alene and Post Falls and the Hayden Area Regional Sewer Board, the EPA found that the discharges of oxygen-demanding pollution from those sources have the reasonable potential to cause or contribute to excursions below Washington's water quality criterion for dissolved oxygen in Lake Spokane. Specifically, the modeling conducted in support of the 2007 draft Idaho permits showed that the levels of discharge allowed by the 1999 permits, from the Idaho wastewater treatment plants alone, could decrease dissolved oxygen concentrations in Lake Spokane by 0.57 mg/L as an average over depth below 8 meters, at the time and location of maximum impact.[1] Washington's water quality standard only allows a DO decrease of 0.2 mg/L below the natural condition for all human sources considered cumulatively (see "Applicable Water Quality Standards and Status of Waters," below). Therefore, a decrease of 0.57 mg/L would cause an excursion above Washington's water quality criterion for DO in lakes and reservoirs (because it is a greater decrease than allowed by the standards). In addition, the modeling conducted in support of the 2007 draft Idaho permits showed that currently permitted levels of discharge could increase pH at the state line to more than 9.0 standard units, which is an excursion above both Idaho and Washington water quality standards (Cope 2006).

Reasonable potential determinations must account for existing controls on point and nonpoint sources of pollution (40 CFR 122.44(d)(1)(ii)). Additional anthropogenic nutrients and oxygen demand discharged by municipal separate storm sewer systems in Idaho further contribute to excursions below dissolved oxygen standards, which serves as additional evidence for the reasonable potential finding.

Therefore, the discharges of TP, ammonia, and $CBOD_5$ from the three WWTPs discharging to the Spokane River in Idaho affect water quality in waters of the State of Washington and have the reasonable potential to cause or contribute to excursions above water quality standards for dissolved oxygen and pH in waters of the State of Washington. The EPA has therefore established water quality-based effluent limits for TP, ammonia and $CBOD_5$ for the Idaho dischargers to the Spokane River that ensure a level of water quality that is derived from and complies with both Washington's and Idaho's water quality standards (40 CFR 122.44(d)(1)(vii)(A)).

C. Applicable Water Quality Standards and Status of Waters

Lake Spokane (also called "Long Lake"), a reservoir located in the State of Washington, and the segments of the Spokane River between the Idaho-Washington border and Lake Spokane, are listed as impaired for DO in Washington's 2008 303(d)/305(b) integrated report. The Spokane River is also listed as a "water of concern" (category 2) for pH in Washington.

The Spokane River is not impaired for dissolved oxygen or pH in the State of Idaho. However, the entire length of the Spokane River that is in Idaho (i.e., both above and below the Post Falls

[1] The fact sheets for the 2007 draft permits for the City of Coeur d'Alene, the City of Post Falls, and the Hayden Area Regional Sewer Board stated the maximum DO decrease in Lake Spokane resulting from currently permitted Idaho discharges as 1.1 mg/L. This was the 95th percentile DO decrease, over the depth of the lake, at the time and location of maximum impact, predicted under the "Permit" modeling scenario (Cope 2006). The Spokane DO TMDL quantifies the DO decrease as the average DO decrease, over the depth of the lake, below 8 meters (see the Spokane DO TMDL at page 36). When this metric is applied to the "Permit" scenario described in the 2006 Cope report and the 2007 fact sheets, the Idaho wastewater treatment plants' potential impact on DO, based on currently-permitted levels of discharge, is 0.57 mg/L.

Dam) is listed in Idaho's 2010 303(d)/305(b) integrated report as being impaired for TP. See Table 1, below, for a summary of the applicable water quality criteria for DO, pH, and nutrients or aesthetics for the Spokane River and Lake Spokane in the States of Idaho and Washington.

Table 1: Dissolved Oxygen and pH Criteria for the Spokane River and Lake Spokane

Parameter	Idaho Standards	Washington Standards
Spokane River		
Dissolved Oxygen	**Numeric Criteria:** Below Post Falls Dam, except during August and September: One (1) day minimum of not less than six point zero (6.0) mg/l or ninety percent (90%) of saturation, whichever is greater. Other times and locations: Dissolved Oxygen Concentrations exceeding six (6) mg/l at all times. (IDAPA 58.01.02, Sections 110.12 and 250) **Natural condition provision:** When natural background conditions exceed any applicable water quality criteria set forth in Sections 210, 250, 251, 252, or 253, the applicable water quality criteria shall not apply; instead, there shall be no lowering of water quality from natural background conditions. (IDAPA 58.01.02.200.09.)	**Numeric Criteria:** From Nine Mile Bridge (river mile 58.0) to the Idaho border (river mile 96.5): 1-day minimum of 8.0 mg/L. From Long Lake Dam (river mile 33.9) to Nine Mile Bridge: 1-day minimum of 9.5 mg/L. (WAC 173-201A, Tables 200(1)(d) and 602) **Natural condition provision:** When a waterbody's D.O. is lower than the criteria in Table 200 (1)(d) (or within 0.2 mg/L of the criteria) and that condition is due to natural conditions, then human actions considered cumulatively may not cause the D.O. of that water body to decrease more than 0.2 mg/L. (WAC 173-201A-200(1)(d)(i))
pH	Within the range of six point five (6.5) to nine point zero (9.0). (IDAPA 58.01.02.250.01.a).	From Nine Mile Bridge (river mile 58.0) to the Idaho border (river mile 96.5): pH shall be within the range of 6.5 to 8.5 with a human-caused variation within the above range of less than 0.5 units. From Long Lake Dam (river mile 33.9) to Nine Mile Bridge: pH shall be within the range of 6.5 to 8.5, with a human-caused variation within the above range of less than 0.2 units. (WAC 173-201A, Tables 200(1)(g) and 602)
Natural Conditions Definition	The physical, chemical, biological, or radiological conditions existing in a water body without human sources of pollution within the watershed. Natural disturbances including, but not limited to, wildfire, geologic disturbance, diseased vegetation, or flow extremes that affect the physical, chemical, and biological integrity of the water are part of natural background conditions. Natural background conditions should be described and evaluated taking into account this inherent variability with time and place. (IDAPA 58.01.02.010.56)	"Natural conditions" or "natural background levels" means surface water quality that was present before any human-caused pollution. When estimating natural conditions in the headwaters of a disturbed watershed it may be necessary to use the less disturbed conditions of a neighboring or similar watershed as a reference condition. (WAC 173-201A-020)
Nutrients / Aesthetics	Surface waters of the state shall be free from excess nutrients that can cause visible slime growths or other nuisance aquatic growths impairing designated beneficial uses. (IDAPA 58.01.02.200.06)	Aesthetic values must not be impaired by the presence of materials or their effects, excluding those of natural origin, which offend the senses of sight, smell, touch, or taste (see WAC 173-201A-230 for guidance on establishing lake nutrient standards to protect aesthetics). (WAC 173-201A-260(2)(b))
Lake Spokane (Washington Water Quality Standards)		
Dissolved Oxygen	For lakes, human actions considered cumulatively may not decrease the dissolved oxygen concentration more than 0.2 mg/L below natural conditions. (WAC 173-201A-200(1)(d)(ii))	

Requirement for Cumulative Analysis of Human Actions

Washington's water quality criterion for dissolved oxygen in lakes and reservoirs requires that "*human actions considered cumulatively* may not decrease the dissolved oxygen concentration more than 0.2 mg/L below natural conditions" (emphasis added). In order to assure that the Idaho sources meet Washington State standards, the dissolved oxygen impact of discharges from Idaho sources must be considered cumulatively with the impact of the Washington sources.

D. Modeling Supporting the Permit Limits

The Clean Water Act's primary mechanism for addressing water quality impairments on a cumulative basis is the total maximum daily load (TMDL) process. However, TMDLs are generally prepared by the States, and a TMDL prepared by a State cannot establish load and wasteload allocations for pollution sources located outside the boundaries of that State. However, when a State prepares a TMDL, the State may reasonably assume that NPDES permits for point sources in upstream States, which have an effect on water quality in the downstream State that is preparing the TMDL, will include effluent limits that ensure compliance with the downstream State's water quality requirements, including water quality standards, because this is required by federal regulations (40 CFR 122.4(d), 40 CFR 122.44(d)(4)). Furthermore, if the EPA is the NPDES permitting authority for the point source discharges in the upstream State (as it is in this case) the downstream State may object to the issuance of the permits in the upstream state if the federal permits in the upstream State will affect the quality of its waters so as to violate any water quality requirements in the downstream State (CWA Section 401(a)(2)). When the Washington State Department of Ecology (Ecology) prepared the *Spokane River and Lake Spokane Dissolved Oxygen Total Maximum Daily Load* (TMDL) Ecology assumed that the NPDES permits for point sources discharging to the Spokane River in Idaho would include limits that would ensure compliance with Washington's water quality standards.

The DO TMDL's Modeling Assumptions for Idaho Point Sources

To ensure that the TMDL's load and wasteload allocations, Avista's DO responsibility, and the loadings from Idaho would cumulatively meet DO WQS in Lake Spokane, when developing the TMDL, Ecology modeled the cumulative impact of both Idaho and Washington pollution sources upon the lake.

The TMDL states: "The dissolved oxygen depletion predicted to result from these assumed Idaho pollutant loads is shown in Tables 14 and 15 of PSU (2010) (the Idaho only source assessment scenario results). The EPA will incorporate permit limits into the NPDES permits for Idaho point source dischargers that ensure that the total dissolved oxygen depletion resulting from those dischargers is no greater than that shown in Tables 14 and 15 of (the Spokane River Modeling Final Scenarios Report 2010, the "2010 modeling report," by Portland State University)." Id. at 35.

Thus, when developing the TMDL, Ecology assumed certain loadings of oxygen-demanding pollution would be discharged in Idaho (shown in the 2010 modeling report at Table 2, the "prior modeling assumptions"), and the modeling supporting the TMDL thereby accounts for any dissolved oxygen decrease resulting from sources in Idaho. However, the TMDL does not apply to the Idaho permits, and the prior modeling assumptions are not binding on the EPA when it drafts the Idaho permits. The prior modeling assumptions are not wasteload allocations with

which the effluent limits in the Idaho permits must be consistent (40 CFR 122.44(d)(1)(vii)(B)). The EPA is free to establish any limits in the Idaho permits for $CBOD_5$, ammonia and TP so long as those limits ensure compliance with both Idaho and Washington WQS, when considered cumulatively with other sources of pollution (40 CFR 122.4(d), 122.44(d)(4)).

The language on Page 35 of the TMDL assumed that, in order to determine if the effluent limits in the Idaho permits would meet Washington's DO criteria, the EPA would isolate the impact of the Idaho point sources and then evaluate those results against the DO impact of the Idaho sources as assumed in the TMDL modeling. The limits would then be set to ensure that the DO depletion from Idaho sources, specifically, was no greater than assumed in the TMDL. This approach would ensure compliance with Washington water quality standards for DO on a cumulative basis by ensuring that the DO impact from *both* Idaho and Washington sources (and therefore the cumulative DO impact from sources in both States) was the same or less than predicted by the TMDL modeling.

However, the EPA believes it is more realistic to conduct the modeling supporting effluent limits for Idaho point sources to reflect the cumulative effect of all human actions that influence DO and to then evaluate the modeling results against Washington's water quality standards. This approach more directly ensures compliance with Washington's water quality standards on a cumulative basis. Thus, the effluent limits are based on modeling of all known human sources of nutrient and oxygen-demanding pollution (i.e. point and non-point sources in Washington and Idaho).

Summary of Model Results

The effluent limits in the draft permits are not the same as the loadings that were assumed in the TMDL, for Idaho point sources. However, as explained below, the effluent limits for Idaho point sources ensure compliance with Washington's water quality standards for dissolved oxygen, when considered cumulatively with the Washington NPDES permits' effluent limits, the TMDL's load allocations for oxygen-demanding pollution from non-point sources, and Avista's dissolved oxygen responsibility (LimnoTech 2011, PSU 2011).

The effluent limits meet Washington's DO criteria (WAC 173-201A-200(1)(d)) when the precision of the water quality model is considered (as explained in detail below). The effluent limits in the Washington and Idaho NPDES permits do not decrease the cumulative average dissolved oxygen in the shaded cells in Table 7 of the final TMDL (i.e., when and where Avista has a DO responsibility) relative to the prior modeling assumptions. In fact, the effluent limits *improve* the dissolved oxygen by 0.006 mg/l relative to the prior modeling assumptions and Washington wasteload allocations when averaged over all reservoir segments and all times of Avista responsibility.

<u>Model Precision</u>

With three exceptions, each individual model output result ensures compliance with Washington's DO criteria (WAC 173-201A-200(1)(d)), when considered cumulatively with the load allocations in Table 6 of the TMDL and Avista's DO responsibility as reported in Table 7 of the TMDL, after results are rounded to the nearest 0.1 mg/l. Each of the three exceptions is characterized by a markedly low arithmetic tolerance for any decrease in DO relative to the TMDL modeling. That is to say, in each of these instances, the DO sag resulting from point and non-point controls under the TMDL scenario, after considering Avista's responsibility, was just

slightly less than 0.25 mg/L. Thus, in those instances, a very small additional DO sag (e.g., 0.002 mg/L) would cause the difference, rounded to the nearest 0.1 mg/L, to change from 0.2 mg/L to 0.3 mg/L. The actual DO decreases in the three exceptions, relative to the TMDL, were 0.002 – 0.003 mg/L (see Table 2, below).

Table 2: Increases in Rounded DO Sag to 0.3 mg/L

Segment	Time Period	Tolerance (mg/L)	Modeled DO Change Relative to TMDL (mg/L)
188	July 1-15	0.0008	-0.003
188	September 1-15	0.0001	-0.002
186	September 16-30	0.0014	-0.003

The EPA believes these deviations are within the precision of the CE-QUAL-W2 model. In a memo dated December 28, 2010, LimnoTech described some issues encountered when performing a sensitivity analysis for the Idaho point sources. As stated on Page 2 of the memo, a reduction in Post Falls' $CBOD_5$ discharge (with all other model inputs held constant) actually effected a 0.002 mg/L *decrease* in the average DO in the reservoir, in times and locations where Avista has a DO responsibility. Other inputs being equal, the DO should have *increased* in response to decreased CBOD discharges. Even if the change in $CBOD_5$ loading was too small to have any discernible impact, the DO should have, at a minimum, been unchanged. Thus, it is reasonable to consider the difference between these two results (0.002 mg/L) to be within the precision of the model for the average DO in times and locations where Avista has a DO responsibility.

Because this average DO is computed from 106 individual results, the model is less precise than 0.002 mg/L for any individual result. Therefore, the EPA believes that the 0.002 – 0.003 mg/L deviations from the TMDL scenario, which resulted in a 0.3 mg/L rounded DO sag in three instances, are within the precision of the CE-QUAL-W2 model. Two results that vary by less than the precision of the model are functionally the same result.

Improvements in DO Relative to the TMDL

Under the proposed effluent limits for Idaho and Washington point sources, the cumulative DO sag, rounded to the nearest tenth of a milligram per liter, would actually decrease to 0.1 mg/L from 0.2 mg/L in five instances, as shown in Table 3, below. Also, as stated above, the alternative improves the dissolved oxygen by 0.006 mg/l (relative to the TMDL) when averaged over all segments and times of Avista responsibility. This means that any decreases in DO concentrations relative to the TDML scenario, at specific times and locations, are balanced by DO improvements at other times and in other locations.

Table 3: Decreases in Rounded DO Sag to 0.1 mg/L		
Segment	**Time Period**	**Modeled Change Relative to TMDL (mg/L)**
172	August 1-15	+0.007
177	September 1-15	+0.018
185	September 1-15	+0.001
175	September 16-30	+0.025
180	September 16-30	+0.018

The Exceptions are Very Infrequent

The three instances where the cumulative DO sag increased to 0.3 mg/L, when rounded to the tenths place, comprise less than 3% of the times and locations where Avista has a DO responsibility (106 total), and 0.7% of all of the times and locations that were evaluated in Table 7 of the TMDL (448 total). Since Table 7 of the Spokane River DO TMDL only provides DO results for June 1st - December 31st, and modeling indicates no violations of DO WQS prior to June 1st, this percentage would be even smaller than 0.7% on a year-round basis.

The TMDL's Margin of Safety

The TMDL has an implicit margin of safety comprised of several conservative assumptions (see the TMDL at Page 51). Some of these will tend to exaggerate the impact of nutrients and oxygen demand discharged by point sources. Specifically:

- Low flows (year 2001) were used as the baseline hydrologic condition.
- All TP is assumed to be bioavailable.[2]
- The top eight meters of the reservoir are not included in the vertical averaging because of amplified algal activity which increases daytime dissolved oxygen levels.

Therefore, the actual DO impact of the point source discharges may be somewhat less than that predicted by the model.

Conclusion

Because the effluent limits in the Idaho and Washington NPDES permits are equivalent to the scenario used to develop the Spokane River TMDL for the reasons described above, the EPA believes that these effluent limits will ensure compliance with Washington's water quality standards for DO, when considered cumulatively with other actions taking place under the TMDL.

Effluent Flow Rates used in the Model Inputs

In 2009, the EPA asked the City of Coeur d'Alene, the City of Post Falls, and the Hayden Area Regional Sewer Board to provide effluent flow rate projections for the year 2027, for use in developing the Spokane River TMDL and those facilities' NPDES permits. The flow projections provided by the utilities at that time were between 6.4 and 7.9 mgd for the City of Coeur d'Alene, 5.0 mgd for the City of Post Falls, and 3.2 mgd for the Hayden Area Regional Sewer Board. After further discussion with the City of Coeur d'Alene and IDEQ, a flow projection of 7.6 mgd was established for the City of Coeur d'Alene.

[2] The model partitions point source phosphorus into two fractions: One which is immediately bioavailable and another that is not immediately bioavailable but becomes bioavailable over time according to first-order kinetics.

These flows are similar to projections made in 2005 (for the year 2028) as part of the Spokane River TMDL collaboration process. The 2005 flow projections were 7.0 mgd for the City of Coeur d'Alene, 5.7 mgd for the City of Post Falls, and 3.2 mgd for HARSB (Spokane River DO TMDL Collaboration Flows and Loadings Workgroup 2005). For Idaho point sources, the modeling supporting the TMDL was based on the effluent flow rates projected in 2009 and effluent concentrations described in the 2010 modeling report at Table 2 (PSU 2010). For the City of Coeur d'Alene and HARSB, these flow projections were also used to determine calculate the effluent limits in the draft permits, as described below.

In March 2010, JUB Engineers completed a revised flow projection for the City of Post Falls, which was 7.65 mgd (JUB 2010). The projection considered projected population growth within the service area, and a 25% addition for wastewater from non-municipal uses. For the City of Post Falls, the increased pollutant loads resulting from this increased flow rate (relative to the 2005 and 2009 projections) were represented in the model using proportionally increased effluent concentrations, instead of an increased effluent flow (see Table 4 below).

Basis for Loads

The model input effluent concentrations of TP, $CBOD_5$, and ammonia for each of the Idaho point sources are summarized in Table 4, below. The seasonal average loads of TP, ammonia, and $CBOD_5$ that are necessary to meet Washington's water quality criterion for DO in Lake Spokane, based on the modeling supporting the TMDL, are calculated by multiplying the projected flow rates for each facility, which were used in the modeling, by the modeled concentrations and the density of water (8.34 lb/gallon). The resulting seasonal average loads are shown in Table 4, below.

Table 4: Idaho Loads used in Modeling Supporting the Permit Limits

Point Source Discharge	Modeled Flow Rate (mgd)	Seasonal Average Modeled Concentrations, February – October Unless Otherwise Noted (mg/L)			Seasonal Average Modeled Loads, February – October Unless Otherwise Noted (lb/day)		
		Ammonia	TP	$CBOD_5$	Ammonia	TP	$CBOD_5$
City of Coeur d'Alene WWTP	7.6	4.29 (Mar. – Oct.)	0.05	3.56 (Feb. – Mar.)	**272 (Mar. – Oct.)**	**3.17**	**226 (Feb. – Mar.)**
				3.2 (Apr. – Oct.)			**203 (Apr. – Oct.)**
HARSB WWTP	3.2	2.9	0.05	2.9	**77.4**	**1.33**	**77.4**
City of Post Falls WWTP[1]	5.0	6.1	0.0765	6.1	**255**	**3.19**	**255**

Notes:
1. Effluent loads for the City of Post Falls are equivalent to a discharge of 0.05 mg/L TP, 4.0 mg/L $CBOD_5$, and 4.0 mg/L ammonia at a flow rate of 7.65 mgd.

E. Translating the Modeled Loads to Effluent Limits

The modeled loads in Table 4 are seasonal average values. However, 40 CFR 122.45(d)(2) states that "(f)or continuous discharges all permit effluent limitations, standards, and prohibitions, including those necessary to achieve water quality standards, shall unless impracticable be stated as…(a)verage weekly and average monthly discharge limitations for POTWs."

In some cases, it is impracticable to express effluent limits as average monthly limits and average weekly limits. In the draft permits for the City of Coeur d'Alene, City of Post Falls, and Hayden Area Regional Sewer Board, the effluent limits for E. coli, chlorine, metals, TP, and, in some cases, ammonia and CBOD are not expressed as average monthly limits and average weekly limits. The basis for expressing effluent limits for E. coli, chlorine, ammonia and metals using averaging periods other than monthly and weekly is explained in Appendices C and E. The basis for expressing HARSB's CBOD limits as seasonal averages, under some circumstances, is explained in Appendix C to the HARSB fact sheet.

In addition, the EPA has determined that it is impracticable to express effluent limits for TP as monthly average and weekly average limits, in this case, for the reasons discussed below. Effluent limits for TP are expressed as seasonal average loading limits that are identical to the loads of TP simulated in the modeling.

Basis for Expressing Effluent Limits for TP as Seasonal Average Limits

In a memorandum dated March 3, 2004 (the Chesapeake Bay Memo), James A. Hanlon, the director of the EPA's Office of Wastewater Management, stated that, for the protection of Chesapeake Bay and its tidal tributaries from excess nutrient loading, it was impracticable to express permit effluent limitations for nutrients (total nitrogen and TP) as daily maximum, weekly average, or monthly average effluent limitations.

The Chesapeake Bay Memo states that:

> *"Establishing appropriate permit limits (for nitrogen and TP) for Chesapeake Bay and its tidal tributaries is different from setting limits for other parameters such as toxic pollutants because: the exposure period of concern for nutrients loading to Chesapeake Bay and its tidal tributaries is very long; the area of concern is far-field (as opposed to the immediate vicinity of the discharge); and the average pollutant load rather than the maximum pollutant load is of concern"* (Page 2).

The Chesapeake Bay Memo further states that:

> *"The nutrient dynamics of (Chesapeake) Bay may not be unique. The establishment of an annual limit with a similar finding of 'impracticability' pursuant to 40 CFR 122.45(d) may be appropriate for the implementation of nutrient criteria in other watersheds when: attainment of the criteria is dependent on long-term average loadings rather than short-term maximum loadings; the circumstances match those outlined in this memo for Chesapeake Bay and its tidal tributaries; annual limits are technically supportable with robust data and modeling as they are in the Chesapeake Bay context; and appropriate safeguards to protect all other applicable water quality standards are employed"* (Pages 2-3).

Similar to Chesapeake Bay, the EPA believes that a finding of impracticability is appropriate in this case as well under 40 CFR 122.45(d).

Modeling Supports the use of Seasonal Average Limits

As stated in the TMDL (Page 33), the wasteload allocations for Washington point sources and the loading assumptions for the Idaho point sources are seasonal average values. Thus, attainment of dissolved oxygen criteria in Lake Spokane is based on long-term average loadings rather than short-term maximum loadings.

Modeling has shown that highly variable discharges from Spokane River point sources, which have an average of 50 µg/L TP, have a very similar impact upon DO in Lake Spokane relative to constant discharges from those sources of exactly 50 µg/L each day (HDR 2009). At times and in locations where Avista had a dissolved oxygen responsibility in the TMDL (see TMDL at Table 7, Pages 49-50), on average, the variable discharge scenario resulted in a 0.003 mg/L *improvement* in DO relative to constant discharges. The variable discharges increased DO by as much as 0.09 mg/L relative to constant discharges in some segments, and the maximum decrease in DO in any reservoir segment at any time was only 0.05 mg/L. Therefore, dissolved oxygen in Lake Spokane is insensitive to short-term increases in TP loading, as long as the seasonal average TP load remains unchanged.

The TP Limits are intended to Control Far Field Effects

Similar to Chesapeake Bay, the TP effluent limits are intended to control far-field effects. Lake Spokane is a 24-mile-long reservoir, the upstream end of which is 42.5 miles downstream from the closest Idaho POTW (the City of Post Falls).

The Permits Include Additional Requirements to Ensure Water Quality Standards are Met with the use of Seasonal Limits

Finally, the draft permits include additional requirements to ensure that water quality standards are met. These requirements include required reporting of monthly average TP loadings. In addition, if, at the end of any month from February through September, the average TP discharge measured to date is greater than the seasonal average loading limit, the permittee must submit a report explaining how it will lower its TP loadings in order to comply with the seasonal average effluent limitations.

The Future Effluent Variability is Unknown

In order to calculate average monthly and average weekly limits that are consistent with a seasonal average load, the effluent variability must be known. Effluent variability may be quantified by the coefficient of variation (CV), which is the ratio of the standard deviation to the mean of the effluent data (also called the relative standard deviation).

Because the TP effluent limits require levels of discharge much lower than current levels, the treatment systems must be upgraded in order to achieve compliance with the TP limits. While historical monitoring data are available, which could be used to quantify the variability of TP in the *existing* treatment facilities, the variability of TP in the effluent, after these upgrades are completed, is unknown.

On Page E-3, the TSD states that "typical values for the CV range from 0.2 to 1.2." The EPA's *Nutrient Removal Technologies Reference Document* (EPA 832-R-08-006) and a technical memorandum submitted to the Spokane River TMDL collaboration titled "Evaluation of Exemplary WWTPs Practicing High Removal of Phosphorus," by Dave Reynolds of CH2M HILL and Dave Clark of HDR, Inc (November 21, 2005) provide CVs for other POTWs that

remove TP. In general, coefficients of variation are within the "typical" range identified by the TSD, but some facilities exhibit CVs that are higher or lower than the typical range (see Table 5, below). Because the loading levels in the TMDL and modeling are long-term (February – October or March – October) average values, the value of the CV can have a significant impact on the value of the average monthly limit. For example, according to Table 5-2 of the TSD, if a facility that sampled for TP 10 times per month had a CV of 0.2, its 95th percentile probability basis average monthly limit should be set at 1.12 times the long-term average. If that facility's CV were equal to 1.2, that facility's average monthly limit should be set at 1.80 times the long-term average. The facility with a CV of 1.2 would have an average monthly limit 60% greater than a facility with a CV of 0.2. If the limits are set at the 99th percentile probability basis, the difference between limits based on a CV of 1.2 as opposed to a CV of 0.2 becomes even larger.

If the CV is not known, an estimate can be made. In fact, it is common practice in the calculation of effluent limits for toxic parameters to assume that the CV is equal to 0.6, if the actual CV is unknown (see the TSD at Pages 53 and E-3). However, in the context of calculating average monthly and average weekly limits from a fixed long-term average, if the estimated CV is less than the actual CV, the effluent limits will be artificially stringent. Conversely, if the estimated CV is greater than the actual CV, the permittee may be able to consistently discharge at levels greater than those modeled, yet maintain compliance with the average monthly effluent limits. This possibility is recognized in the Chesapeake Bay Memo (see Page 4). The Chesapeake Bay Memo also points out that "the effluent loading of nutrients is not constant due to seasonal temperature fluctuations in northern climates" because biological nutrient removal is less effective at lower temperatures (Page 5). The TSD does not provide a means to account for this additional variability in the effectiveness of biological nutrient removal due to temperature.

Table 5: Coefficients of Variation (CV) for POTWs Removing Phosphorus (Sorted by CV)

Facility	Average TP (ug/L)	CV
Chelsea, MI	90	0.14
Kalispell, MT	120	0.19
Kelowna, BC	140	0.21
Lee County, FL	102	0.35
Las Vegas	144	0.37
Pinery	30	0.38
Clearwater, FL Marshall St	130	0.40
Cauley Creek	105	0.44
Rock Creek	77	0.48
Lone Tree	32	0.48
Noman Cole	104	0.48
Genessee County, MI	240	0.50
Johnston Co, NC	260	0.62
Hyattsville, MD	430	0.62
McMinnville, OR	58	0.63
North Cary, NC	380	0.64
Durham	102	0.66
Clearwater, FL Northeast	200	0.82
Piscataway, MD	90	0.89
Iowa Hill	9	0.97
Hyrum, UT	70	1.07
Hagerstown, MD	660	1.45

In contrast, as stated on Page E-3 of the TSD, when calculating effluent limits for toxic parameters, "in many cases, changes in the CV will have little impact on the final permit limit." This is because the averaging periods for water quality criteria for toxic parameters are very short (generally 4 days for chronic aquatic life criteria and 1 hour for acute aquatic life criteria, see IDAPA 58.01.02.010). Effluent limits for toxic parameters must therefore control short-term peak concentrations. This constrains the effluent limit calculations, making the final effluent limits relatively insensitive to effluent variability.

Seasonal Average TP Limit Summary

In summary, modeling shows that, similar to Chesapeake Bay, dissolved oxygen concentrations in Lake Spokane are related not to maximum TP loading but to long-term average TP loading. That is to say, Lake Spokane is insensitive to short-term increases in TP loading from Idaho point sources, as long as the seasonal average is not increased. The effluent limits for TP in this case are based on far-field, as opposed to near-field, water quality concerns. Because the future variability of TP concentrations and loadings in these effluents is unknown, the EPA cannot calculate appropriate monthly average and weekly average effluent limits for TP with any degree of certainty. If the EPA were to assume a CV, this could result in effluent limits for TP that are artificially stringent, or which could allow the loading of TP to exceed that simulated in the modeling supporting the permits and the TMDL. For these reasons, the EPA believes that it is impracticable to calculate appropriate average monthly and average weekly limits for TP, in this case. The effluent limits for TP are therefore stated as seasonal average effluent limits.

The seasonal average TP effluent limits are identical to the seasonal average TP loads simulated in the modeling supporting the permits and the TMDL (see Table 4, above).

Reporting Requirements for Seasonal Average Limits

The permits include additional reporting requirements to ensure that water quality standards are attained. These include reporting the monthly average and maximum weekly average total phosphorus loads and concentrations on the monthly DMRs for February – October, inclusive, reporting the partial seasonal average load partial seasonal average phosphorus load for February 1st through the last day of the monitoring month, inclusive, for February – September, and, if the partial seasonal average phosphorus load is greater than the seasonal effluent limit, the permittee must submit a written report with the DMR, explaining the steps that the permittee will take to reduce its discharge of total phosphorus in order to achieve compliance with the seasonal average effluent limit by October 31st.

If the permittee ceases discharge to the river for at least three days during the season during which seasonal average limits apply, the permittee may include zero pounds per day values in the calculation of the partial seasonal average phosphorus load as specified in Attachment A of the draft permit. The purpose of Attachment A is to ensure that periods of zero discharge are given the same weight as the periods of time when the permittee is discharging, in the calculation of the seasonal average discharge. The number of zeros allowed for averaging is equal to the required sampling frequency of three times per week (0.429 samples per day), multiplied by the number of days of zero discharge, and rounded down to the nearest whole number.

Calculating Average Monthly Effluent Limits for $CBOD_5$ and Ammonia

Seasonal average effluent limits are not appropriate for all of the oxygen demanding pollutants in these permits if they can be directly toxic or have effects on dissolved oxygen which are more directly related to short-term maximum loading. The Chesapeake Bay Memo states that the rationale it provides for annual average limits for TP and total nitrogen "does not apply to parameters other than nitrogen and phosphorus that may exhibit an oxygen demand to waters of the bay. Such parameters include dissolved oxygen, biochemical oxygen demand, and ammonia" (Page 2).

In addition to exhibiting an oxygen demand, ammonia can be directly toxic to aquatic life at high concentrations. In order to prevent acute toxicity to aquatic life, the *Technical Support Document for Water Quality-Based Toxics Control* (EPA/505/2-90-001) or TSD recommends that effluent limits for pollutants which may be toxic to aquatic life be expressed as average monthly and maximum daily limits, because even an average weekly limit has an averaging period that is too long to ensure that acute toxicity is prevented (see TSD at section 5.2.3). Maximum daily limits are not necessary for HARSB and Post Falls because, as described in Appendix D, the EPA has determined that discharges of ammonia at the proposed average weekly limits will not cause or contribute to excursions above water quality criteria for ammonia, for toxicity (IDAPA 58.01.02.283). However, expressing the ammonia limits exclusively as seasonal average limits could allow maximum daily or weekly average ammonia loads high enough to cause toxicity. Therefore, effluent limits for ammonia, for HARSB and Post Falls are expressed as average monthly and average weekly limits, consistent with 40 CFR 122.45(d)(2).

Effluent limits for ammonia, for the City of Coeur d'Alene, are expressed as a combination of seasonal average, average monthly, and maximum daily effluent limits. The seasonal average limit is based on meeting water quality standards for dissolved oxygen in the State of Washington, downstream from the point of discharge and is identical to the seasonal average modeled loading of ammonia in Table 4, above. The average monthly and maximum daily limits are based on Idaho water quality standards that are intended to prevent acute and chronic toxicity from ammonia, near the point of discharge. The use of average monthly limits in combination with maximum daily limits, when effluent limits are based on preventing toxicity to aquatic life, is consistent with the recommendations of the TSD (Section 5.2.3). It is impracticable to prevent acute toxicity using an average weekly limit. Therefore, the structure of City of Coeur d'Alene's effluent limits for ammonia is consistent with 40 CFR 122.45(d)(2) and with EPA guidance. The calculation of the toxicity-based ammonia limits for the City of Coeur d'Alene is explained in the City of Coeur d'Alene's fact sheet.

While $CBOD_5$ is not directly toxic, it has a more direct and immediate effect on dissolved oxygen concentrations than does TP. TP discharges result in an oxygen demand due to growth and ultimately decay of excess algae and other aquatic plants (see the Chesapeake Bay Memo at Page 3, footnote 2), but $CBOD_5$ begins to exert an oxygen demand at a roughly constant (first order kinetic) rate immediately upon being discharged to a receiving water. Furthermore, POTWs must meet technology-based effluent limits for $CBOD_5$, which are stated as maximum 30- and 7-day concentrations, and a minimum 30-day average removal rate (40 CFR 133.102(a)(4)). Effluent limits for $CBOD_5$, for continuous discharges, are therefore expressed as average monthly and average weekly limits, consistent with 40 CFR 122.45(d)(2).

As stated in Section 5.3.1 of the TSD, when the averaging periods for effluent limits differ from those of the water quality criterion or the wasteload allocation, it is necessary to use statistics to develop permit limits that comply with the regulations governing the expression of effluent limitations and consider effluent variability, while ensuring a low probability that the criterion or allocation will be exceeded.

Since the assumed loads from the TMDL modeling scenarios are seasonal average values applicable for an eight or nine month period, the EPA will consider the assumed loading values above to be long term averages. In Table 5-2, the TSD provides a formula for calculating an average monthly permit limit that is consistent with a long term average wasteload allocation. The average monthly limit is a function of the CV and the sampling frequency.

Coefficient of Variation (CV)

Because these treatment facilities must be upgraded in order to achieve the proposed effluent limitations for TP, historic effluent variability for $CBOD_5$ and ammonia may not be representative of future effluent variability. Therefore, the EPA has assumed that the CV is equal to 0.6, consistent with the recommendation of the TSD when effluent data are not available (see TSD at Page E-3).

Sampling Frequency

The EPA proposes a sampling frequency of three times per week, for all three Idaho dischargers, for $CBOD_5$ and ammonia. This will result in at least 12 samples per month for each of these parameters. The TSD recommends using the actual required sampling frequency in effluent limit calculations, unless the actual frequency is less than four samples per month (see TSD at Section 5.5.3).

Probability Basis

The TSD recommends the use of the 95th percentile probability basis (5% exceedance probability) for the average monthly limit (see TSD at section 5.5.4). The EPA has used the 95th percentile probability basis to establish average monthly limits for $CBOD_5$ and ammonia, consistent with the recommendations of the TSD.

Average Monthly Limits for $CBOD_5$ and Ammonia Based on Washington Water Quality Standards

Using the equation shown in Table 5-2 of the TSD, and the CVs and probability basis described above, the EPA has calculated the average monthly limits shown in Table 6, below. Spreadsheets showing the detailed calculations of the average monthly limits are available from the EPA upon request.

Table 6: Average Monthly Limits

Source	Seasonal Average Load (lb/day)	CV	Multiplier	Average Monthly Limit (lb/day)
Ammonia (February – October unless otherwise noted)				
Coeur d'Alene (March – June)	Coeur d'Alene's average monthly ammonia limits are based on Idaho's water quality standards. See Appendix E of the Coeur			**649**
Coeur d'Alene (July – September)				**330**

Table 6: Average Monthly Limits				
Source	**Seasonal Average Load (lb/day)**	**CV**	**Multiplier**	**Average Monthly Limit (lb/day)**
Coeur d'Alene (October)	d'Alene fact sheet.			**525**
HARSB	77.4	0.6	1.31	**101**
Post Falls	255	0.6	1.31	**334**
$CBOD_5$ (February – October unless otherwise noted)				
Coeur d'Alene (Feb. – Mar.).	226	0.6	1.31	**295**
Coeur d'Alene (Apr. – Oct.)	203	0.6	1.31	**265**
HARSB (continuous discharge)	77.4	0.6	1.31	**101**
Post Falls	255	0.6	1.31	**334**

Average Weekly Limits

$CBOD_5$

To calculate average weekly limits for $CBOD_5$, the EPA has used the same 1.6:1 (40:25) ratio between the average monthly limits and the average weekly limits as the technology-based effluent concentration limits (40 CFR 133.102(a)(4)).

Ammonia

Average weekly limits for ammonia were calculated by adapting the relationship shown in Table 5-3 of the TSD to an average weekly limit instead of a maximum daily limit, using the required sampling frequency, the 95th percentile probability basis for the average monthly limit, the 99th percentile probability basis for the average weekly limit, and the coefficients of variation shown in Table 6, above. The resulting average weekly limits for HARSB and Post Falls are shown in Table 7, below. Table 7 also shows the maximum daily limits for the City of Coeur d'Alene. A complete explanation of the maximum daily ammonia limits for the City of Coeur d'Alene can be found in Appendix E to the Coeur d'Alene fact sheet.

Table 7: Maximum Daily and Average Weekly Limits for Ammonia						
Source	**Average Monthly Limit (AML) (lb/day)**	**CV**	**Number of Samples per Month**	**Number of Samples per Week**	**Ratio**	**Average Weekly Limit (AWL) or Maximum Daily Limit (MDL) (lb/day)**
Coeur d'Alene (Mar. –June)	649	0.6	12	N/A	2.38	**1547 (MDL)**
Coeur d'Alene (July – Sep.)	330	0.6	12	N/A	2.38	**786 (MDL)**
Coeur d'Alene (Mar. – Oct.)	525	0.6	12	N/A	2.38	**1252 (MDL)**
HARSB	101	0.6	12	3	1.58	**160 (AWL)**
Post Falls	334	0.6	12	3	1.58	**528 (AWL)**

Basis for Mass Limits

The federal regulation 40 CFR 122.45(f)(1) requires that effluent limits be expressed in terms of mass, except for pollutants that cannot be properly expressed as mass (e.g. pH and temperature). Effluent limits for TP, ammonia, and $CBOD_5$ can be properly expressed as mass. Therefore, effluent limits for these parameters are, at a minimum, expressed in terms of mass.

Effluent limits for TP are expressed exclusively in terms of mass because there are no applicable technology-based standards or numeric in-stream water quality standards for TP, the effluent limitations for TP are intended to meet Washington water quality standards, which apply several miles downstream from the discharges after complete mixing has occurred, and phosphate phosphorus is neither directly toxic to aquatic life nor directly hazardous to human health. Therefore, there is no basis to express the water quality-based TP limits in units other than mass.

As explained below, $CBOD_5$ and ammonia are additionally limited in terms of other units of measurement.

Basis for Concentration and Removal Rate Limits for $CBOD_5$ and Ammonia

Pollutants which are limited in terms of mass may be additionally limited in terms of other units of measurement, and the permit shall require the permittee to comply with both limitations (40 CFR 122.45(f)(2)).

Applicable technology-based standards for $CBOD_5$ are expressed in terms of concentration and removal rate (40 CFR 133.102(a)(4)). Therefore, in addition to the water quality-based mass limits described above, the permits include additional technology-based effluent limits for $CBOD_5$, which are expressed in terms of concentration (25 mg/L monthly average and 40 mg/L weekly average, 40 CFR 133.102(a)(4)(i – ii)) and a minimum removal rate of 85% (40 CFR 133.102(a)(4)(iii)).

The proposed concentration and removal rate limits for $CBOD_5$ are technology-based limits. The proposed mass limits for $CBOD_5$ are water quality-based limits.

For parameters which may be directly toxic to aquatic life, the TSD recommends that effluent limitations be expressed in terms of both concentration and mass for effluents discharging to waters with less than 100-fold dilution (see TSD at Section 5.7.1). The complete-mix dilution ratios, based on 7Q10 river flow rates and current treatment plant design flow rates, are as shown in Table 8:

Table 8: Complete Mix Dilution Factors

Current Design Flows (CFS)				
Coeur d'Alene		9.3		
Hayden		3.7		
Post Falls		7.7		
Season	**7Q10 (CFS)**	**Dilution Factors**		
		CDA	**HARSB**	**PF**
July – Sept.	500	54	135	65
Oct. – June	1030	111	277	133

From July – September, under critical low flow conditions, the complete-mix dilution factor is less than 100:1 for Coeur d'Alene and Post Falls. Therefore, effluent limits for ammonia, which can be directly toxic to aquatic life, are expressed in terms of both mass and concentration, from July – September, for Coeur d'Alene and Post Falls. From October – June, the complete-mix dilution factors are greater than 100:1 for all three Idaho dischargers. Therefore, concentration limits for ammonia are generally not necessary during this time.

However, from November – January, to ensure compliance with the anti-backsliding provisions of the Clean Water Act, concentration limits are included in the draft reissued permits for HARSB and Post Falls because such limits were in the prior permits.

Effluent limits for POTWs must generally be calculated based on design flow (40 CFR 122.45(b)(1)). The relationship between the concentration and mass limits is therefore calculated using the following equation:

Concentration limit (mg/L or parts per million) = mass limit (lb/day) ÷ [8.34 lb/gallon × design flow (mgd)]

Proposed Effluent Limits Summary

The effluent limits for TP, $CBOD_5$, and ammonia that are derived from and comply with the applicable water quality standards of Idaho and Washington are as follows:

Table 9: Proposed Effluent Limits for TP, $CBOD_5$ and ammonia

Parameter	Units	Effluent Limits		
		Average Monthly Limit	**Average Weekly Limit**	**Maximum Daily Limit**
Proposed Effluent Limits for the City of Coeur d'Alene				
TP as P (Feb. – Oct.)	lb/day	3.17 seasonal average		
TP as P (Nov. – Jan.)	lb/day	Phosphorus management plan. See permit at Part II.C.		
$CBOD_5$ (November – January)	mg/L	25	40	—
	lb/day	1251	2002	—
	% removal	85% min.	—	—
$CBOD_5$ (February – March)	mg/L	25	40	—
	lb/day	295	472	—
	% removal	85% min.	—	—
$CBOD_5$ (April – October)	mg/L	25	40	—
	lb/day	265	424	—
	% removal	85% min.	—	—
Ammonia (March – June)	lb/day	649	—	1547
Ammonia (July – September)	mg/L	6.59	—	15.7
	lb/day	330	—	786
Ammonia (March – June and October)	lb/day	525	—	1252
Ammonia (November – February)	No limits. Monitor and report only.			
Proposed Effluent Limits for the City of Post Falls				
TP as P (Feb – Oct.)	lb/day	3.19 seasonal average		
TP as P (Nov. – Jan.)	lb/day	Phosphorus management plan. See permit at Part II.C.		
$CBOD_5$ (November – January)	mg/L	25	40	—
	lb/day	1043	1668	—
	% removal	85% min.	—	—
$CBOD_5$ (February – October)	mg/L	25	40	—
	lb/day	334	534	—
	% removal	85% min.	—	—

Table 9: Proposed Effluent Limits for TP, $CBOD_5$ and ammonia				
Parameter	**Units**	**Effluent Limits**		
		Average Monthly Limit	**Average Weekly Limit**	**Maximum Daily Limit**
Ammonia (February – June and October)	lb/day	334	528	—
Ammonia (July – September)	mg/L	8.00	12.7	—
	lb/day	334	528	—
Ammonia (November – January)	mg/L	17.7	—	63.8
	lb/day	737	—	2661
Proposed Effluent Limits for the Hayden Area Regional Sewer Board				
TP as P (Feb. – Oct.)	lb/day	1.33		
TP as P (Nov. – Jan.)	lb/day	Phosphorus management plan. See permit at Part II.C.		
$CBOD_5$ (November – January)	mg/L	25	40	—
	lb/day	500	801	—
	% removal	85% min.	—	—
$CBOD_5$ (February – October when discharging continuously)	mg/L	25	40	—
	lb/day	101	162	—
	% removal	85% min.	—	—
$CBOD_5$ (February – October when not discharging continuously)	mg/L	25	40	—
	lb/day	77.4 seasonal average		
	% removal	85% min.	—	—
Ammonia (February – October)	lb/day	101	160	—
Ammonia (November – January)	mg/L	49.2	—	156
	lb/day	985	—	3128

Comparison of Proposed Effluent Limits to the Corresponding Limits in the 2007 Draft Permits

The following nine figures provide a comparison of the phosphorus, ammonia, and $CBOD_5$ limits in the current draft permits to the corresponding effluent limits in the 2007 draft permits. Note that the 2007 draft permits did not propose effluent limits for TP in February, whereas the current draft permits do propose such limits.

Figure 1

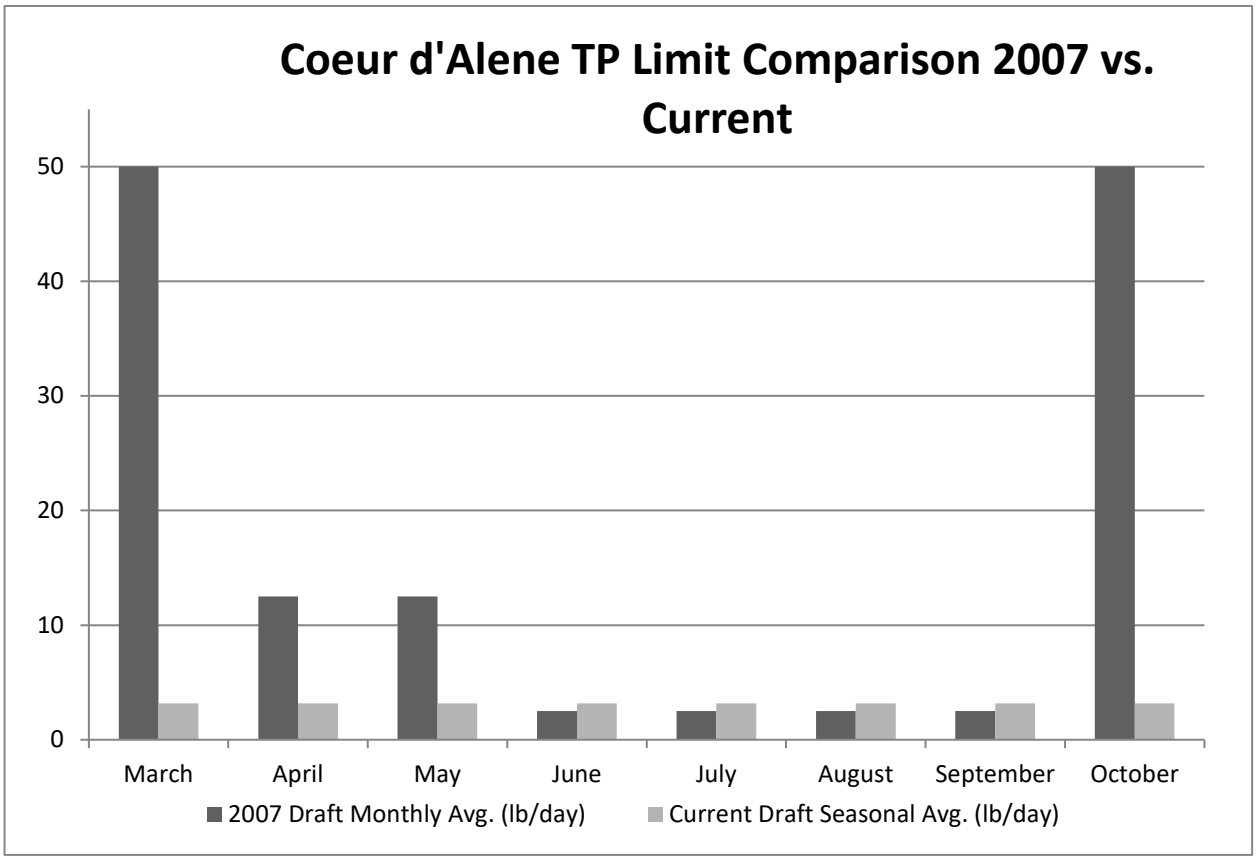

Coeur d'Alene TP Limit Comparison 2007 vs. Current
50
40
30
20
10
0
March
April
May
June
July
August
September
October
2007 Draft Monthly Avg. (lb/day)
Current Draft Seasonal Avg. (lb/day)

Figure 2

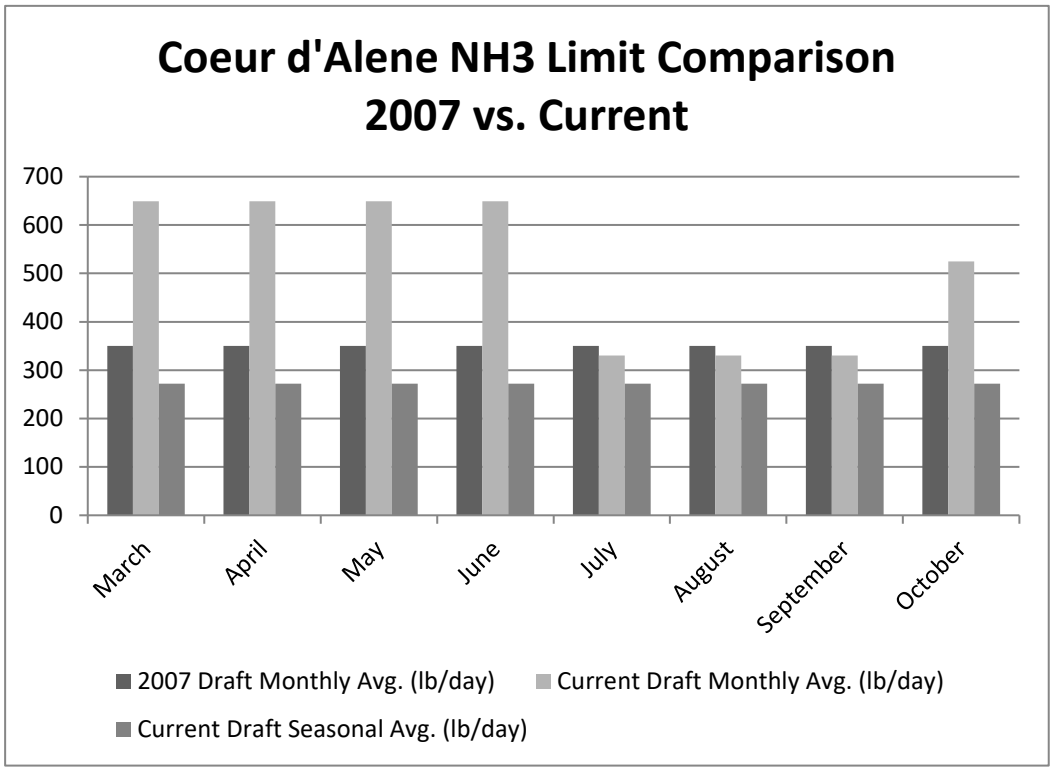


Figure 3

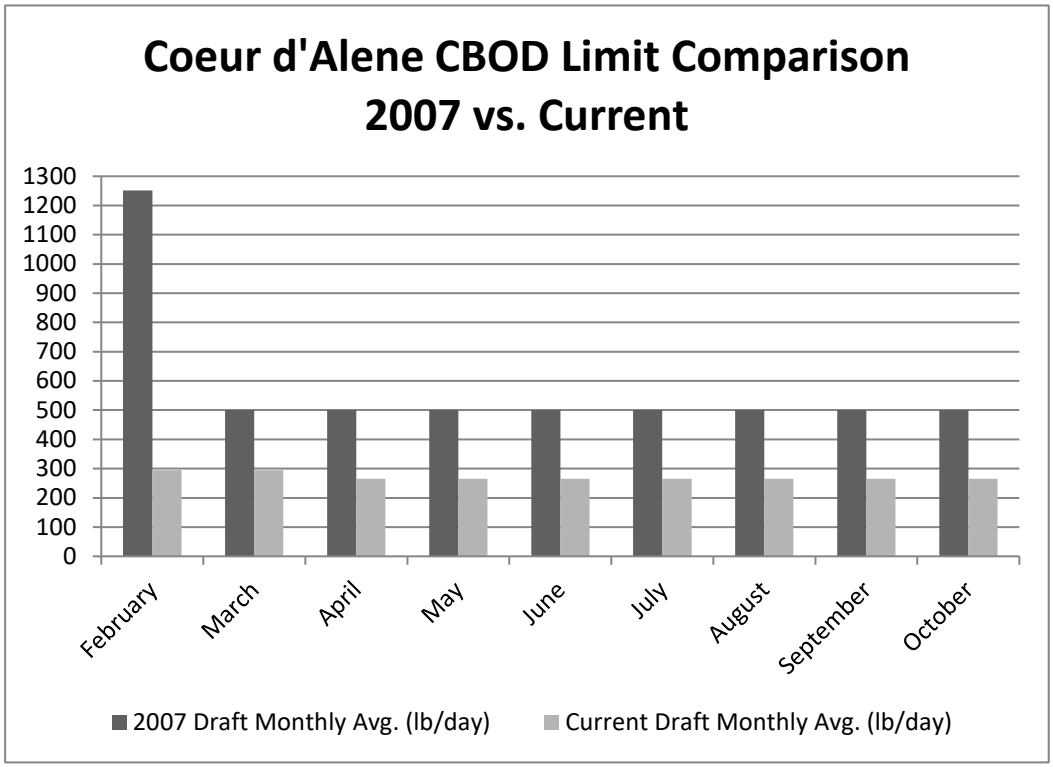


Figure 4

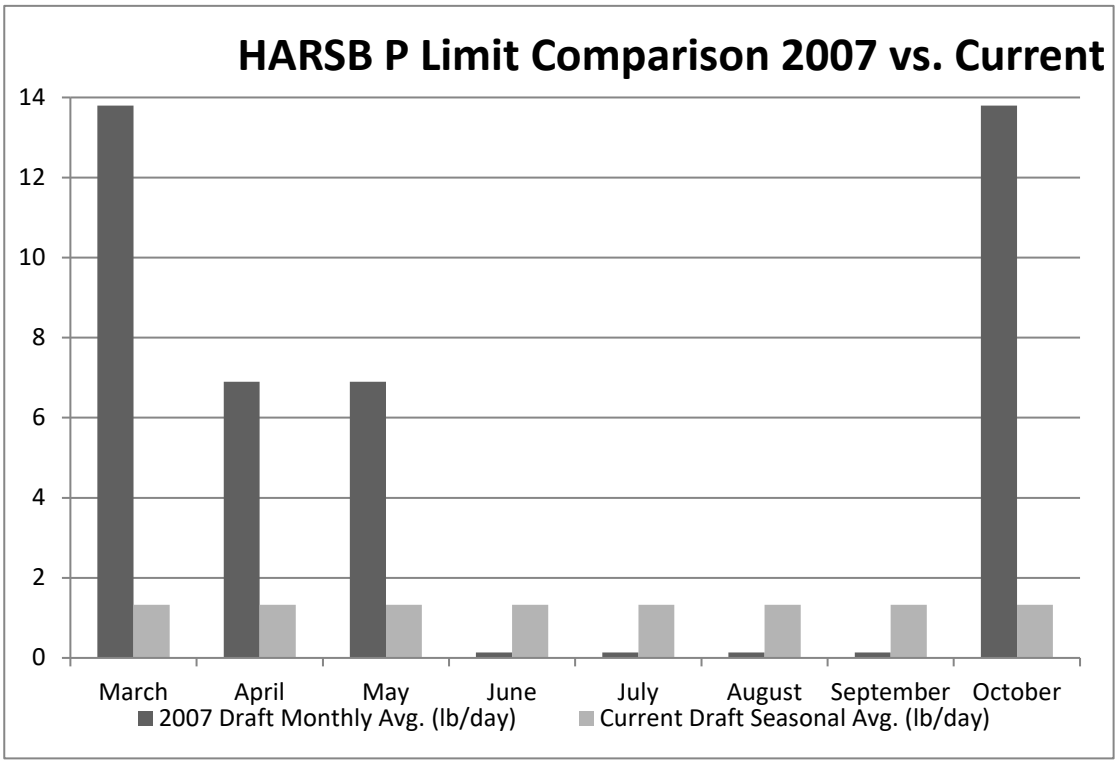


Figure 5

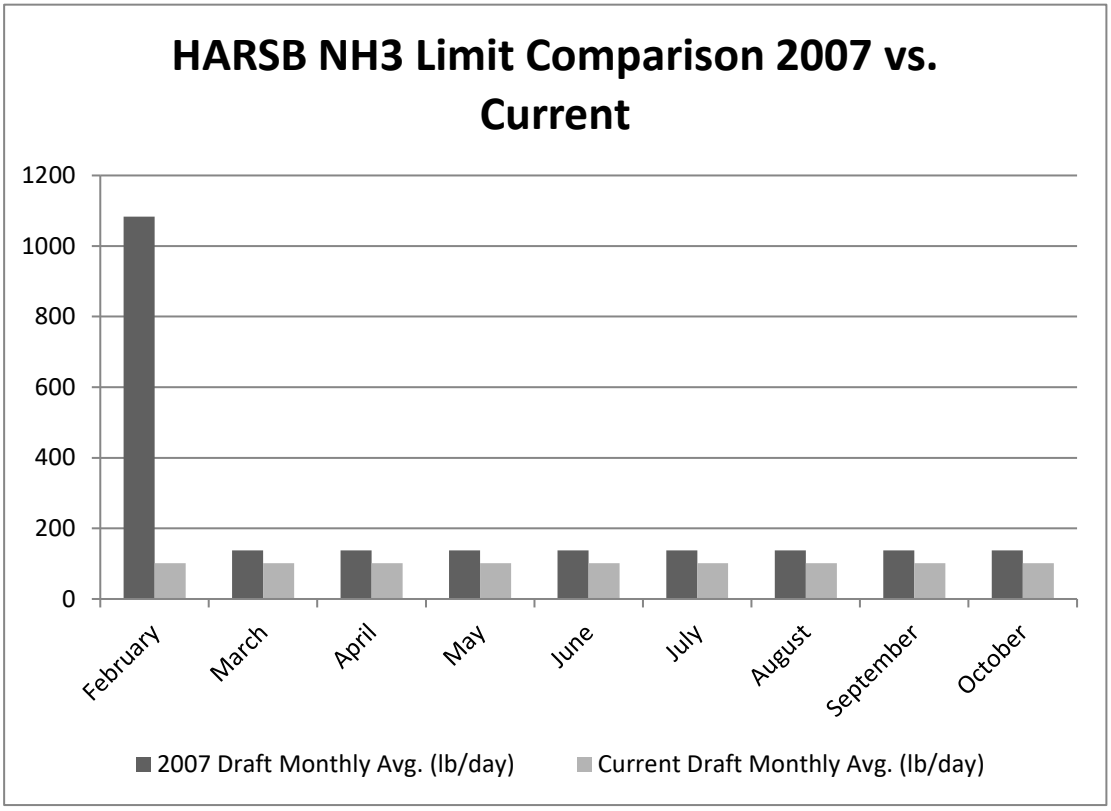


Figure 6

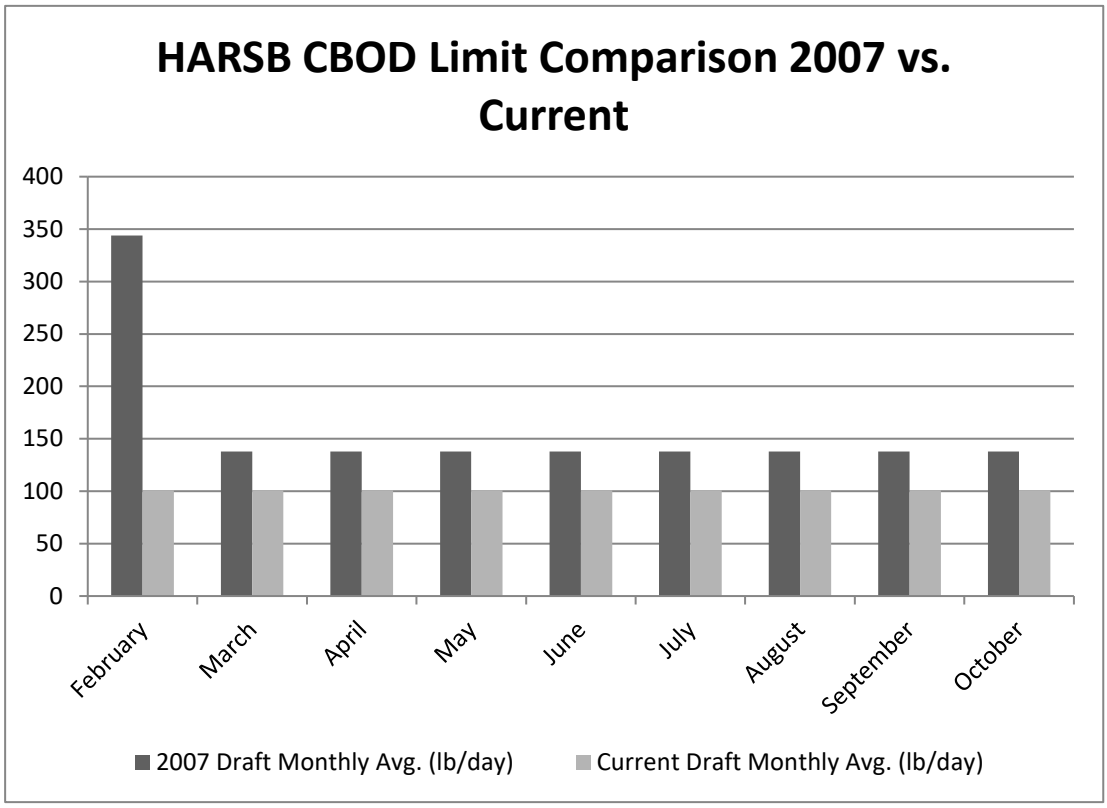


Figure 7

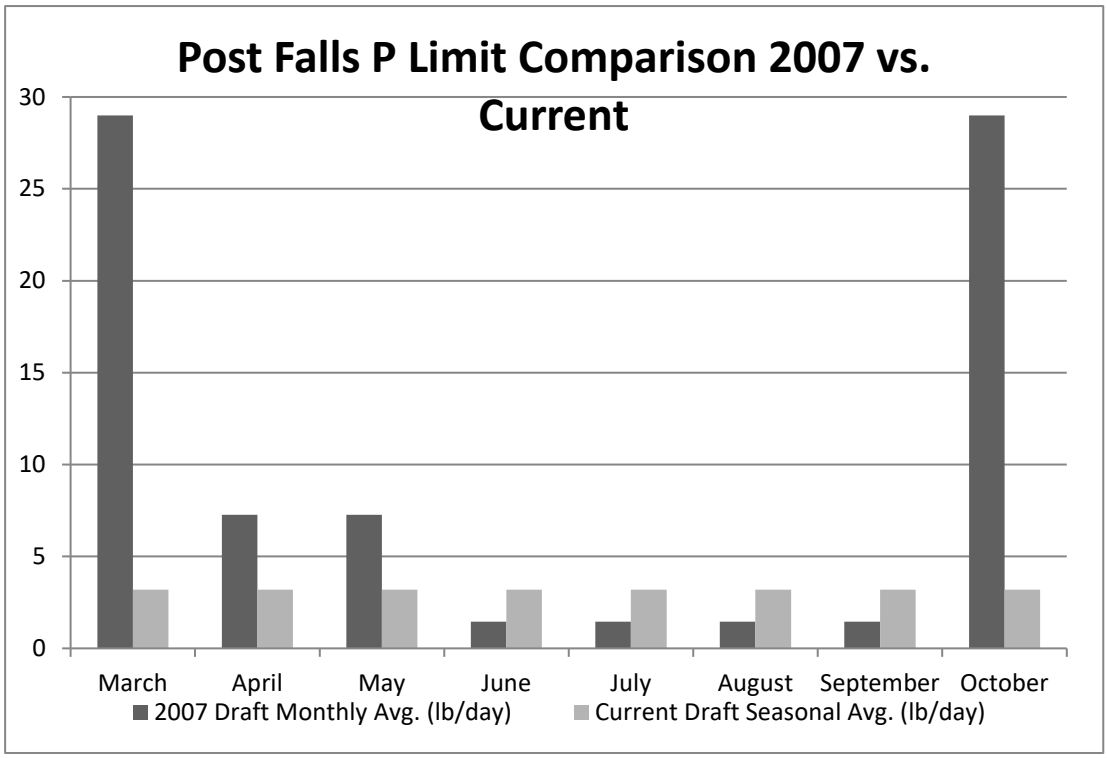


Figure 8

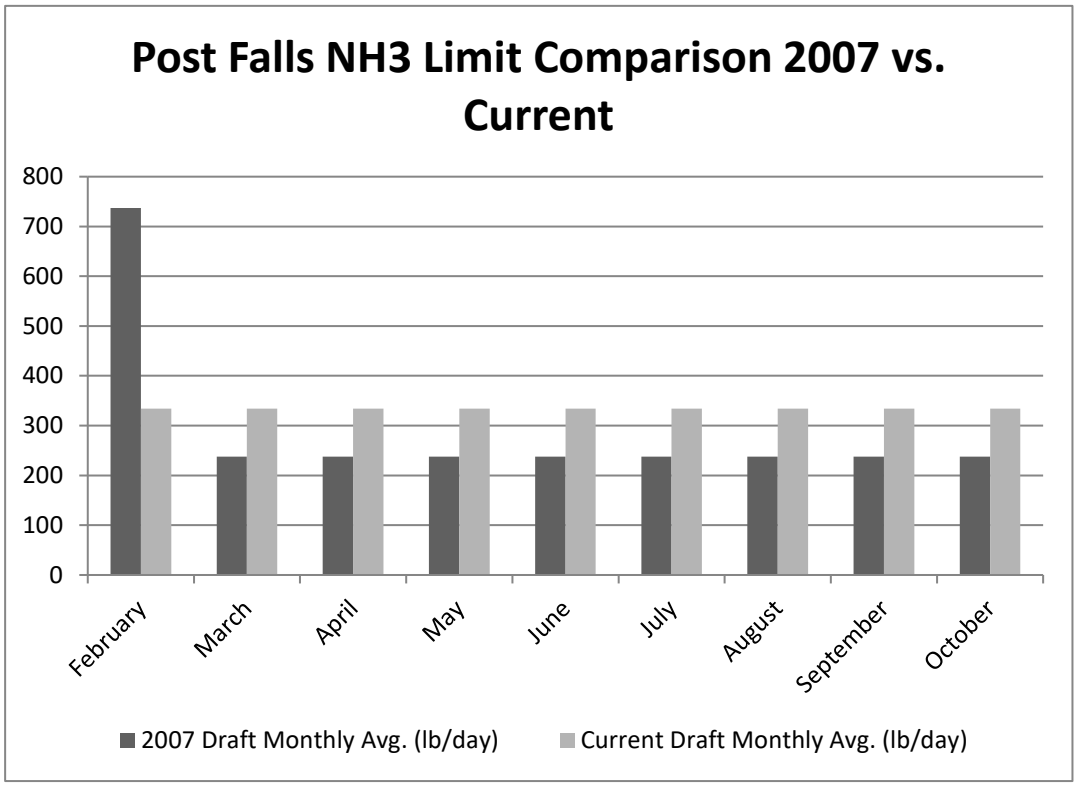
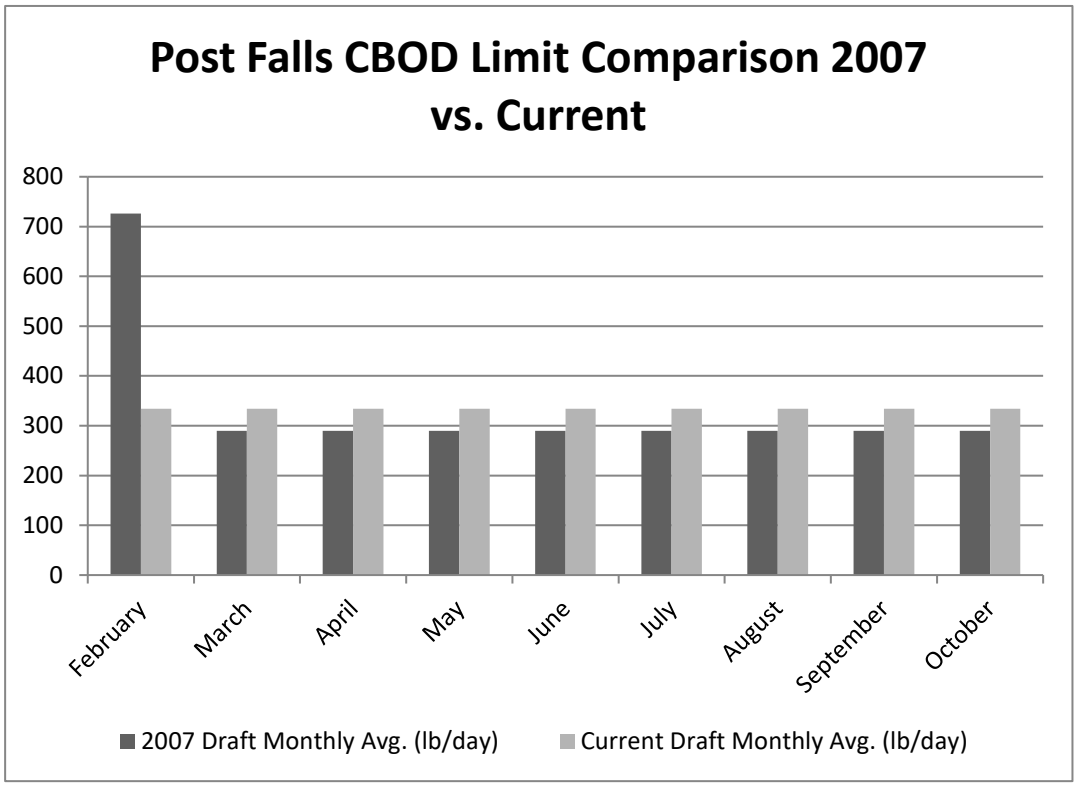


Figure 9



F. Effect of the Proposed Effluent Limits

Lake Spokane

As explained above, modeling shows that the proposed effluent limits for TP, $CBOD_5$ and ammonia, considered cumulatively with the effluent limits for Washington point sources in their NPDES permits and the load allocations for Washington non-point sources and the DO improvements required of Avista in the DO TMDL, will ensure compliance with Washington's water quality criterion for DO in Lake Spokane.

State Line

The memoranda from Portland State University and LimnoTech do not specifically analyze the effect of the proposed effluent limits at the state line. Therefore, as explained below, the EPA has analyzed the model output and determined that, in compliance with 40 CFR 122.4(d) and 40 CFR 122.44(d)(4), the proposed effluent limits for the Idaho point sources will ensure that Washington's and Idaho's water quality standards are met at the state line.

<u>Dissolved Oxygen</u>

Even with zero discharge of human-caused pollution in Idaho, Washington's numeric criterion for dissolved oxygen (8.0 mg/L) would only be attained at the state line about 96% of the time. However, this does not mean that Washington's water quality standards would not be attained the remaining 4% of the time, because, at times, the natural DO concentration at the state line is less than 8.0 mg/L. Washington's water quality standards state that, "when a water body's DO is lower than the (numeric) criteria…(or within 0.2 mg/L of the criteria) and that condition is due to natural conditions, then human actions considered cumulatively may not cause the DO of that water body to decrease more than 0.2 mg/L" (WAC 173-201A-200(1)(d)(i)).

At times when the model predicts that DO is less than 8.2 mg/L (i.e., within 0.2 mg/L of the numeric criterion), with zero discharge of human-caused pollution in Idaho, the maximum DO decrease attributable to the Idaho dischargers, including stormwater discharges, at the state line, is 0.13 mg/L below natural conditions, which is less than the decrease allowed by the standards (0.2 mg/L). Therefore, the effluent limits will ensure compliance with Washington's water quality standards for dissolved oxygen at the state line.

In Idaho, in waters designated for salmonid spawning, the applicable numeric dissolved oxygen criterion is 6.0 mg/L or 90% of saturation, whichever is greater. Modeling predicts that, under the proposed effluent limits, the DO concentration at the state line will be greater than 6.0 mg/L at all times (the minimum DO is 7.65 mg/L). The dissolved oxygen concentration will be greater than 90% of saturation, 99.96% of the time, under both the no source and effluent limit scenarios. Therefore, the effluent limits will ensure compliance with Idaho's numeric DO criteria 99.96% of the time, and the very infrequent excursions below the numeric criteria (0.04% of the time) occur due to natural background conditions and do not violate Idaho's water quality standards (see IDAPA 58.01.02.200.09).

<u>pH</u>

The Washington pH criterion for the Spokane River at the state line is "pH shall be within the range of 6.5 to 8.5 with a human-caused variation within the above range of less than 0.5 units"

(WAC 173-201A, Table 200(1)(g)). Idaho's water quality standard is "within the range of six point five (6.5) to nine point zero (9.0)" (IDAPA 58.01.02.250.01.a).

Under the proposed effluent limits, the predicted minimum and maximum pH at the state line are 7.12 and 7.96 standard units, respectively, which complies with the criteria for pH range for both Idaho and Washington. The maximum human-caused pH changes are an increase of 0.21 standard units, and a decrease of 0.26 standard units, which is less than the 0.5 unit human-caused variation allowed by the Washington standards. Therefore, the proposed effluent limits ensure compliance with both Washington's and Idaho's water quality standards for pH, at the state line.

Phosphorus

Neither Idaho nor Washington has statewide numeric water quality criteria for TP. However, Idaho does have a narrative criterion for nutrients (IDAPA 58.01.02.200.06), and the Spokane River is 303(d) listed for TP in Idaho. The EPA has a Clean Water Act Section 304(a) recommended water quality criterion for TP, for the western forested mountains ecoregion, which is 10 µg/L (EPA 822-B-00-015, Table 2). The criteria document recommends that nutrient criteria be applied using a seasonal or annual averaging period (Page 6).

The model predicts that, with the proposed effluent limits in place, the median TP concentration at the state line, from February through October, will be 9.1 µg/L. This is less than the EPA-recommended criterion for TP, for this ecoregion, which is 10.0 µg/L (EPA 2000). The model predicts that the proposed effluent limits will result in only a 0.8 µg/L increase relative to the February – October median TP concentration predicted under the "no source" scenario (i.e., with no discharge from any Idaho point sources, including storm water). The concentration of TP at the State line, from February through October, will be less than 10 µg/L 55% of the time, with the proposed effluent limits in place. Therefore, the effluent limits proposed in the draft permits will ensure compliance with Idaho's and Washington's narrative criteria for nutrients and aesthetics (IDAPA 58.01.02.200.06, WAC 173-201A-260(2)(b)).

Temperature

The Washington water quality standard for temperature in the Spokane River at the state line is: "Temperature shall not exceed a 1-DMax of 20.0°C due to human activities. When natural conditions exceed a 1-DMax of 20.0°C no temperature increase will be allowed which will raise the receiving water temperature by greater than 0.3°C; nor shall such temperature increases, at any time exceed t=34/(T+9)" (WAC 173-201A-602).

The capital "T" represents the background temperature as measured at a point or points unaffected by the discharge and representative of the highest ambient water temperature in the vicinity of the discharge (WAC 173-201A-200(1)(c)(ii)(A)). The maximum "no source" temperature (i.e. the temperature with no discharge from any Idaho point sources) at the state line is 26.4 ºC; the value of 34/(T + 9) therefore equals 0.96 ºC. The maximum temperature increase attributable to the Idaho dischargers, at any time, is 0.27 °C, which is much less than the allowable increase (0.96 °C). At times when the predicted temperature, under the "no source" scenario, is greater than or equal to 20 ºC, the maximum temperature increase attributable to the Idaho point sources is 0.13 ºC, less than half the increase allowed by the criterion (0.3 °C).

Therefore, the Idaho dischargers do not have the reasonable potential to cause or contribute to excursions above water quality standards for temperature in the State of Washington, and it is not

necessary to include effluent limits for temperature in these permits, in order to ensure compliance with Washington's water quality criteria for temperature.

Furthermore, the EPA has determined that the Idaho dischargers do not have the reasonable potential to cause or contribute to excursions above water quality standards for temperature, in waters of the State of Idaho (Nickel 2007, 2012). Therefore, the permits do not require water quality-based effluent limits for temperature.

Ammonia

The model predicts that, under the proposed ammonia effluent limits, the maximum instantaneous concentration of ammonia at the state line will be 0.42 mg/L, which is less than either State's chronic numeric water quality criteria for ammonia, under critical conditions for temperature and pH. Thus, the effluent limits in the draft permits will ensure compliance with both States' numeric water quality criteria for ammonia, at the state line.

The EPA has determined that the proposed effluent limits for ammonia will ensure compliance with Idaho's water quality standards for ammonia, after mixing with less than 25% of the critical receiving stream flow, in accordance with Idaho's mixing zone policy (IDAPA 58.01.02.060). Therefore, it is not necessary to establish more stringent water quality-based effluent limits for ammonia, for the purpose of meeting Idaho's water quality standards in the near field.

The State of Washington's Antidegradation Policy

In addition to ensuring compliance with the State of Washington's water quality criteria, the draft permits for the City of Coeur d'Alene, City of Post Falls, and Hayden Area Regional Sewer Board ensure compliance with the State of Washington's antidegradation requirements (WAC 173-201A-300 – 330).

In the State of Washington, the Spokane River is currently 303(d) listed for dissolved oxygen, lead, temperature, total dissolved gas, 2,3,7,8 TCDD, and PCBs. The Spokane River is therefore not of higher quality than the applicable water quality criteria for these parameters. Therefore, the affected waters of the State of Washington are not afforded "Tier II" antidegradation protection under WAC 173-201A-320, for these parameters.

The Spokane River and Lake Spokane are 303(d)-listed for DO in the State of Washington. Washington's antidegradation policy states that "for waters that do not meet assigned criteria, or protect existing or designated uses, the department will take appropriate and definitive steps to bring the water quality back into compliance with the water quality standards." As explained above, the effluent limits for TP, $CBOD_5$, and ammonia ensure compliance with Washington's water quality criteria for dissolved oxygen. The permits contain effluent limits that ensure compliance with Idaho's water quality criteria for lead (which are more stringent than Washington's criteria) at the end-of-pipe. Thus, the lead limits are also stringent enough to ensure compliance with Washington's water quality criteria for lead. Furthermore, as explained above, these discharges do not have the reasonable potential to cause or contribute to excursions above Washington's water quality criteria for temperature. Washington's EPA-approved water quality criteria for these parameters ensure that existing and designated uses are maintained and protected, thereby ensuring compliance with Washington's Tier I antidegradation requirements (WAC 173-201A-310).

No antidegradation analysis is necessary for PCBs or 2,3,7,8 TCDD because the Idaho permits do not contain effluent limits for these parameters and there is no information demonstrating that the Idaho permittees discharge these parameters. Therefore the discharges do not allow lower water quality due to these pollutants. The permits include monitoring requirements for PCBs and 2,3,7,8 TCDD. The monitoring data will be used to determine if the discharges have the reasonable potential to cause or contribute to excursions above water quality standards for PCBs or 2,3,7,8 TCDD. Available data indicate that the Spokane River does not exceed either State's Clean Water Act effective PCB criterion at the State line (Serdar et al. 2011).[3]

For other parameters, in general, the effluent limits in the draft permits are as stringent as or more stringent than the corresponding effluent limits in the previous permits. In those cases, the permits are not new or expanded relative to the 1999 permits, thus they will not cause a lowering of water quality under Washington's Tier II antidegradation provisions (WAC 173-201A-320).

The Spokane River has not been designated an outstanding resource water. Therefore, the Tier III antidegradation protections of WAC 173-201A-330 do not apply to the Spokane River.

Summary

The effluent limits that the EPA is proposing for TP, ammonia and $CBOD_5$ ensure a level of water quality that is derived from and complies with the applicable water quality standards of the States of Idaho and Washington, for dissolved oxygen, pH, ammonia, and nutrients, based on the cumulative impact of all human actions. Therefore, the level of water quality to be achieved by these effluent limits is derived from and complies with the applicable water quality standards of the States of Washington and Idaho, in compliance with federal regulations (40 CFR 122.4(d), 122.44(d)(1)(vii)(A), 122.44(d)(4)).

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[3] Washington's PCB criterion is identical to the criterion that is in effect for Clean Water Act purposes in Idaho.

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Appendix C: General Basis for Effluent Limits

The following discussion explains in more detail the statutory and regulatory bases 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 effluent limits.

A. Technology-Based Effluent Limits

Federal Secondary Treatment Effluent Limits

In sections 301(b)(1)(B) and 304(d)(1), the CWA established a performance level, referred to as "secondary treatment," which all POTWs are required to meet. The EPA developed and promulgated "secondary treatment" regulations that are found in 40 CFR 133.102. These technology-based limits identify the minimum level of effluent quality attainable by secondary treatment in terms of five-day biochemical oxygen demand (BOD_5) or five-day carbonaceous biochemical oxygen demand ($CBOD_5$), total suspended solids (TSS), and pH.

The regulations allow effluent limits for oxygen demanding material to be expressed as either BOD_5 or $CBOD_5$, at the option of the permitting authority. The EPA has chosen to express the effluent limits in terms of $CBOD_5$ in this case. The federally promulgated secondary treatment effluent limits are listed in Table C-1.

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

Parameter	Average Monthly Limit	Average Weekly Limit	Range
$CBOD_5$	25 mg/L	40 mg/L	—
TSS	30 mg/L	45 mg/L	—
Removal Rates for $CBOD_5$ and TSS	85% (minimum)	—	—
pH	—	—	6.0 – 9.0 s.u.

The EPA has determined that the secondary treatment $CBOD_5$ effluent limits are adequately stringent to protect water quality in the States of Idaho and Washington from November through January. From February through October, more stringent water quality-based $CBOD_5$ effluent limits apply (see Appendix B).

The EPA has determined that the secondary treatment TSS limits are adequately stringent to protect water quality in the Spokane River at all times, therefore, the TSS limits in the draft permit are the secondary treatment limits.

The EPA has determined that the secondary treatment pH effluent limits are not stringent enough to protect water quality in the Spokane River. Therefore, more stringent water quality-based pH effluent limits apply.

Chlorine

Chlorine is often used to disinfect municipal wastewater prior to discharge. The Coeur d'Alene facility 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.

The EPA has determined that the technology-based effluent limits for chlorine are not stringent enough to ensure compliance with water quality standards. Therefore, the draft permit proposes more stringent water quality-based effluent limits for chlorine.

Mass-Based Limits

Effluent limits are generally calculated on a concentration basis. The federal regulation at 40 CFR 122.45(f) generally requires that effluent limits be expressed in terms of mass. The regulation at 40 CFR 122.45(b)(1) requires that effluent limitations for POTWs be calculated based on the design flow of the facility. The mass based limits are expressed in pounds per day and are generally calculated from the corresponding concentration limits as follows:

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

For example, the technology-based mass limits for $CBOD_5$ are as follows:

<u>Average Monthly Limit:</u>

25 mg/L × 6 mgd × 8.34 lb/gallon = 1251 lb/day

<u>Average Weekly limit:</u>

40 mg/L × 6 mgd × 8.34 lb/gallon = 2002 lb/day

From February – October, the mass limits for CBOD are calculated independently of the concentration limits. The concentration limits are technology-based at all times. The mass limits are water quality-based from February – October and technology-based from November – January.

B. Water Quality-based Effluent Limits

Statutory and Regulatory Basis

Section 301(b)(1)(C) of the CWA requires the development of limitations in permits necessary to meet water quality standards. 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. 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

[1] 8.34 is the density of water, in units of pounds per gallon.

cause, or contribute to an excursion above any State or Tribal water quality standard, including narrative criteria for water quality. Effluent limits must also meet the applicable water quality requirements of affected States other than the State in which the discharge originates, which may include downstream States (40 CFR 122.4(d), 122.44(d)(4), see also CWA Section 401(a)(2)).

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 for the discharge in an approved TMDL. There are no approved TMDLs that specify wasteload allocations for this discharge; all of the water quality-based effluent limits are calculated directly from the applicable water quality standards.

Reasonable Potential Analysis

When evaluating the effluent to determine if water quality-based effluent limits are needed based on numeric criteria, the EPA projects the receiving water concentration for each pollutant of concern. The 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. Dilution is considered in the reasonable potential analysis if and only if the State authorizes a mixing zone in its draft CWA Section 401 certification. If the projected concentration of the pollutant in the receiving water exceeds the numeric criterion for that specific chemical, then the discharge has the reasonable potential to cause or contribute to an excursion above the applicable water quality standard, and a water quality-based effluent limit is required.

Mixing Zones

Sometimes it is appropriate to allow a small area of the receiving water to provide dilution of the effluent. These areas are called mixing zones. Mixing zone allowances will increase the mass loadings of the pollutant to the water body, and decrease treatment requirements. Mixing zones can be used only when there is adequate receiving water flow volume and the receiving water meets the criteria necessary to protect the designated uses of the water body. Mixing zones are authorized by the Idaho Department of Environmental Quality (IDEQ). Based on IDEQ's draft Clean Water Act Section 401 certification, some of the water quality-based effluent limits in this permit have been calculated using a mixing zone. Effluent limit and reasonable potential calculations for cadmium, lead, and zinc did not use mixing zones because the receiving water does not meet water quality standards for those pollutants. If IDEQ does not authorize mixing zones in the final Clean Water Act Section 401 certification for certain parameters, the water quality-based effluent limits for those parameters 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 excursion above water quality standards in the receiving water.

In cases where a mixing zone is not authorized (e.g., for zinc, in this case), either because the receiving water already exceeds the criterion, the receiving water flow is too low to provide dilution, or the State does not authorize one, the criterion becomes the WLA. Establishing the criterion as the wasteload allocation ensures that the permittee will not cause or contribute to an excursion above 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 F.

C. Facility-Specific Limits

pH

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

The permittee has collected pH and alkalinity data for the effluent. The EPA obtained pH and alkalinity data for the receiving water from the USGS monitoring station at the outlet from Lake Coeur d'Alene into the Spokane River. The EPA has used these data to determine the discharge's effects on the pH of the receiving water. The EPA believes that a mixing zone for pH is appropriate from October through June. From July through September a pH mixing zone cannot be authorized because the Spokane River pH can be close to 6.5, and because there is relatively little dilution available.

The proposed pH limits are 6.3 to 9.0 from October through June and 6.5 to 9.0 (criteria end-of-pipe) from July through September. If IDEQ does not grant a mixing zone for pH in its final CWA Section 401 certification, the EPA will change the pH limits to a range of 6.5 to 9.0 standard units year round, thus requiring that the pH criteria are met before the effluent is discharged to the receiving water. See Appendix F for effluent limit calculations for pH.

Total Phosphorus

The EPA has determined that the phosphorus in the permitted discharge, together with the discharges of phosphorus from the Hayden Area Regional Sewer Board and the City of Post Falls as well as municipal stormwater discharged to the Spokane River in Idaho, has the reasonable potential to cause or contribute to excursions above water quality criteria dissolved oxygen in the State of Washington, downstream of the discharge. The EPA has calculated water quality-based effluent limits for total phosphorus which ensure a level of water quality that is derived from and complies with the applicable water quality requirements of both Washington and Idaho. See Appendix B for a complete discussion of the calculation of water quality-based effluent limits for total phosphorus.

Ammonia

As explained in Appendix B, the EPA has determined that, independent of any concerns about the Coeur d'Alene facility's discharge of ammonia causing or contributing to excursions above water quality standards for ammonia in waters of the State of Idaho, the Coeur d'Alene facility's discharge of ammonia, in combination with other sources of oxygen-demanding pollution, has the reasonable potential cause or contribute to nonattainment of Washington's water quality standards for dissolved oxygen (DO), from March – October. Therefore effluent limits are necessary for ammonia, from March – October, in order to ensure compliance with Washington's water quality standards for DO.

The ammonia effluent limit that is based on Washington's water quality standards is a seasonal average limit of 272 lb/day, which is applicable from March – October. Because this seasonal average limit does not control the short-term (e.g., monthly or daily) maximum loads or concentrations of ammonia in the discharge, it may not, by itself, ensure compliance with Idaho's numeric water quality criteria for ammonia, which are expressed as maximum allowable 1-hour, 4-day, and 30-day averages (IDAPA 58.01.02.283). Therefore, in addition to the seasonal average mass limit for ammonia, the draft permit proposes average monthly and maximum daily effluent limits for ammonia, during March – October.

During November – February, the EPA has determined that the discharge does not have the reasonable potential to cause or contribute to excursions above water quality standards for ammonia. Therefore, no effluent limits are proposed for ammonia from November – February.

Five-Day Carbonaceous Biochemical Oxygen Demand

As stated above, the EPA has promulgated technology-based effluent limits for $CBOD_5$. The technology-based limits apply from November through January.

However, the EPA has determined that, from February through October, more stringent mass effluent limits are necessary for $CBOD_5$, in order to ensure compliance with water quality criteria for dissolved oxygen in the State of Washington. The concentration and removal rate limits remain technology-based, year-round. See Appendix B for a complete discussion of the basis for the water quality-based mass effluent limits for $CBOD_5$ for February – October.

Metals

In the 1999 permit, the EPA established "criteria end-of-pipe" water quality-based effluent limits for lead and zinc. Since the Spokane River is 303(d) listed for cadmium, lead, and zinc, the river has no assimilative capacity to dilute these metals in an effluent. Therefore, no mixing zone may be authorized for cadmium, lead, or zinc.

In 2004, the EPA modified the metals limits in the City of Coeur d'Alene's permit. The lead limits were deleted and the zinc limits were made less stringent than those in the 1999 permit.

The numeric values of the acute and chronic water quality criteria for cadmium, lead, zinc, and certain other metals are dependent upon the hardness of the water. For the criteria end-of-pipe reasonable potential and effluent limit calculations for cadmium, lead and zinc, the effluent hardness was used to calculate the water quality criteria. As long as the concentrations of cadmium, lead, and zinc in the effluent are below the water quality criteria (calculated at the

effluent hardness) the effluent will not cause or contribute to an in-stream excursion above water quality standards as it mixes with the receiving water.[2]

Concentration Limits for Zinc

The EPA has determined that the concentration (i.e., µg/L) effluent limits for zinc in the 1999 permit, as modified in 2004, are not stringent enough to ensure compliance with water quality criteria, with no mixing zone. Therefore, the EPA has recalculated the concentration effluent limits for zinc, and has proposed more-stringent concentration limits for zinc (see Appendix E).

A reasonable potential analysis, which did not consider the dilution of the effluent in the receiving water, showed that the discharge does not have the reasonable potential to cause or contribute to excursions above water quality criteria for cadmium or lead. Therefore, the permit does not include any concentration effluent limits for cadmium or lead.

The loading effluent limits for zinc that are necessary to ensure compliance with the CWA and federal regulations are more stringent than the corresponding limits in the 1999 permit, as modified in 2004, and thus will also ensure compliance with IDAPA 58.01.02.055.04. Therefore, Table 4 of the draft permit does not include effluent limits for zinc. The permittee must comply with the concentration and loading effluent limits for zinc in Table 1 at the point of discharge regardless of any offset plan.

The offset plan provision applies only to the loading effluent limits specified by the State of Idaho in its draft CWA Section 401 certification, as discussed below.

Loading Limits Necessary to Comply with the State's Draft CWA Section 401 Certification

The loading effluent loading limits for cadmium and lead in the draft permit are those that are necessary to ensure compliance with Idaho State law, as specified in the draft CWA Section 401 certification. These limits are shown in Table 3 of the draft permit.

IDAPA 58.01.02.055.04 requires that the total load of pollutants causing water quality limited listings must remain constant or decrease within the watershed until a TMDL or equivalent process is completed. Therefore, the lead and zinc loading limits must be at least as stringent as those in the 1999 permit (i.e., they must be based on the design flow of the POTW as it existed in 1999, even though the design flow has increased) in order to ensure compliance with IDAPA 58.01.02.055.04. In addition, even though the 1999 permit did not include effluent limits for cadmium and the discharge does not have the reasonable potential to cause or contribute to excursions above water quality criteria for cadmium, the facility does discharge cadmium. To ensure that the total loading of cadmium does not increase, the State of Idaho specified effluent limits for cadmium in its CWA Section 401 certification. These effluent limits must be incorporated into the permit (40 CFR 122.44(d)(3), 124.53(e), 124.55(a)(2)).

The State of Idaho's CWA Section 401 certification provides that the permittee may increase its loading of cadmium and lead above the loading limits shown in Table 3 of the draft permit, if and only if prior to the discharge of an increased load, an offset plan developed by the permittee

[2] Because the shape of the lead criteria curves, when plotted against hardness, are "concave up," (i.e., the second derivative is always positive), calculating criteria end-of-pipe water quality-based effluent limits for lead, using the hardness of the effluent, can contribute to excursions above water quality criteria as the discharge mixes with a receiving water that is softer than the effluent. This was addressed in this case by calculating a tangent line to the water quality criteria at the State of Idaho's hardness "floor" of 25 mg/L as CaCO3 and calculating water quality-based effluent limits based on the tangent line.

and approved by DEQ is in place. The offset plan must demonstrate that the additional metals loading from the increased discharge will be offset by other actions or projects in the watershed and will otherwise meet concentration limits of this permit. Once approved by DEQ, Coeur d'Alene must implement the approved offset plan in order to increase its load of cadmium, lead and zinc.

The offset plan cannot be used to demonstrate compliance with any of the effluent limits in Table 1 or Table 4 of the draft permit; it may only be used to demonstrate compliance with effluent limits in Table 3 of the draft permit.

Loading Limits Necessary to Ensure Compliance with the CWA and Federal Regulations

As stated above, the discharge does not have the reasonable potential to cause or contribute to excursions above water quality criteria for cadmium or lead. Therefore effluent limits are not necessary to ensure compliance with water quality criteria for cadmium or lead, and there are no loading effluent limits for cadmium or lead in Table 4, however, there are monitoring and reporting requirements.

The EPA is specifically requesting public comments on the effluent limits for cadmium, lead and zinc.

Copper and Silver

The EPA has determined that the discharge does not have the reasonable potential to cause or contribute to excursions above water quality standards for copper. Therefore the draft permit does not propose any effluent limits for copper.

The EPA has also determined that the discharge does not have the reasonable potential to excursions above water quality standards for silver from July – September and from October – June when the effluent flow is less than or equal to 4.2 mgd. Therefore, the draft permit does not propose effluent limits for silver under these circumstances.

However, the EPA has determined that the prior permit's effluent limits for silver, for October – June, when effluent flows are greater than 4.2 mgd, are not stringent enough to ensure compliance with water quality criteria. Therefore, the EPA has calculated more-stringent water quality-based effluent limits for silver, for October – June, when effluent flows are greater than 4.2 mgd.

E. Coli

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 a geometric mean of 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, and a minimum sampling frequency of five grab samples per month (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.).

The goal of a water quality-based effluent limit is to ensure a low probability that water quality standards will be exceeded in the receiving water as a result of a discharge, while considering the variability of the pollutant in the effluent (see TSD at Section 5.3.1). Because a single sample value exceeding 406 organisms per 100 ml indicates a likely exceedance of the geometric mean criterion, the EPA has imposed an instantaneous (single grab sample) maximum effluent limit for E. coli of 406 organisms per 100 ml, in addition to a monthly geometric mean limit of 126 organisms per 100 ml, which directly implements the water quality criterion for E. coli. This will ensure that the discharge will have a low probability of exceeding water quality standards for E. coli.

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. The terms “average monthly limit” and “average weekly limit” are defined in 40 CFR 122.2 as 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.

D. Summary of Limits and Bases

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

Table C-3 Summary of Bases for Effluent Limits and BMP Requirements

Limited Parameter	Basis for Limit
Ammonia (March – October monthly average and maximum daily)	CWA Section 301(b)(1)(C), 40 CFR 122.4(d), 40 CFR 122.44(d), IDAPA 58.01.02.283, IDAPA 58.01.02.060 (water quality-based, with mixing zone)
Ammonia (March – October seasonal average)	CWA Section 301(b)(1)(C), 40 CFR 122.4(d), 40 CFR 122.44(d), WAC 173-201A-200(1)(d)(ii) (water quality-based, all affected States)
$CBOD_5$ (concentration & removal rate)	Clean Water Act (CWA) Section 301(b)(1)(B), 40 CFR 133 (technology-based)
$CBOD_5$ (mass, February – October)	CWA Section 301(b)(1)(C), 40 CFR 122.4(d), 40 CFR 122.44(d), WAC 173-201A-200(1)(d)(ii) (water quality-based, all affected States)
$CBOD_5$ (mass, November – January)	Clean Water Act (CWA) Section 301(b)(1)(B), 40 CFR 133, 40 CFR 122.45(b)(1), 122.45(f) (technology-based, mass limits)
Chlorine	CWA Sections 402(o), 301(b)(1)(C), 40 CFR 122.44(d), IDAPA 58.01.02.051 (anti-backsliding, antidegradation)
E. Coli	CWA Section 301(b)(1)(C), 40 CFR 122.44(d), IDAPA 58.01.02.251.01 (water quality-based)
Floating, Suspended or Submerged Matter	CWA Section 301(b)(1)(C), 40 CFR 122.44(d), IDAPA 58.01.02.200.05 (water quality-based)
pH (July – September)	CWA Section 301(b)(1)(C), 40 CFR 122.44(d), IDAPA 58.01.02.250.01.a. (water quality-based)

Table C-3 Summary of Bases for Effluent Limits and BMP Requirements	
pH (October – June)	CWA Section 301(b)(1)(C), 40 CFR 122.44(d), IDAPA 58.01.02.250.01.a, IDAPA 58.01.02.060 (water quality-based, with mixing zone)
Phosphorus (February – October)	CWA Section 301(b)(1)(C), 40 CFR 122.4(d), 40 CFR 122.44(d), WAC 173-201A-200(1)(d)(ii) (water quality-based, all affected States)
Phosphorus Management Plan	40 CFR 122.44(k) (best management practices)
Silver (October – June, effluent flow > 4.2 mgd)	CWA Section 301(b)(1)(C), 40 CFR 122.4(d), 40 CFR 122.44(d), IDAPA 58.01.02.210, IDAPA 58.01.02.060 (water quality-based, with mixing zone)
Toxics Management Plan	40 CFR 122.44(k) (best management practices)
TSS	CWA Section 301(b)(1)(B), 40 CFR 133 , 40 CFR 122.45(b)(1), 122.45(f) (technology-based, mass limits)
Cadmium and Lead	40 CFR 122.44(d)(3), 124.53(e), 124.55(a)(2) (conforming to the conditions of a CWA Section 401 certification)
Zinc	CWA Section 301(b)(1)(C), 40 CFR 122.4(d), 40 CFR 122.44(d), IDAPA 58.01.02.210 (water quality-based)

Appendix D: Reasonable Potential Calculations

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 an excursion above Idaho's federally approved water quality standards for certain pollutants. The EPA generally uses the process described in Section 3.3 of the *Technical Support Document for Water Quality-based Toxics Control* (EPA 1991) to determine reasonable potential.

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

A. Mass Balance

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

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

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 (generally set equal to the design flow of the treatment plant per 40 CFR 122.45(b)(1)).
Q_u = Receiving water low flow rate upstream of the discharge (e.g. 1Q10, 7Q10)

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

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

The above form of the equation is based on the assumption that the discharge is rapidly and completely mixed with the receiving stream and that 100% of the stream flow is available for mixing. However, the Idaho water quality standards generally restrict the percentage of the stream flow that may be allowed for dilution of the effluent. When the mixing zone uses less than 100% of the stream flow, the equation becomes:

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

In the above equation, MZ is the fraction of the receiving water flow available for dilution. The Idaho water quality standards generally limit mixing zones to 25% of the volume of the stream flow (IDAPA 58.01.02.060). The MZ was generally set equal to 0.25 (25%) for the reasonable

potential analysis. Exceptions include cadmium, lead, and zinc (because the receiving water is impaired for those parameters and cannot provide dilution of the effluent, therefore no mixing zone may be authorized for those parameters).

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

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

The criteria for the metals of concern are expressed as dissolved metal. However, effluent limits for metals in NPDES permits must be expressed as total recoverable metal. The dissolved criterion must be converted to an equivalent total recoverable concentration by using a conversion factor, as shown in Equation D-5:

$$C_d = CF \times C_e \qquad \text{(Equation D-5)}$$

Equation D-3 can be simplified by introducing a "dilution factor,"

$$D = \frac{Q_e + 0.25 \times Q_u}{Q_e} \qquad \text{(Equation D-6)}$$

The dilution factors for the various seasons, for the reasonable potential analysis are shown in Table D-1, below:

Table D-1: Dilution Factors

Season	**Mixing Zone** (% of critical flow)	**Acute Dilution Factor** (1Q10)	**Chronic Dilution Factor** (7Q10)	**Chronic Ammonia Criterion Dilution Factor** (30Q10)	**Human Health Non-Carcinogen Dilution Factor** (30Q5)	**Human Health Carcinogen Dilution Factor** (Harmonic Mean)
Full Year	25%	N/A	N/A	N/A	14.5	56.2
July – September ≤ 4.2 mgd	25%	20.2	20.2	N/A	N/A	N/A
July – September > 4.2 mgd	25%	14.5	14.5	N/A	N/A	N/A
October – June	25%	25.0	28.7	N/A	N/A	N/A
November – February for ammonia	25%	29.8	N/A	38.2	N/A	N/A
Cadmium, lead, and zinc	No mixing zone (receiving water is impaired).					

After the dilution factor simplification, Equation D-2 becomes:

$$C_d = \frac{C_e - C_u}{D} + C_u \qquad \text{(Equation D-7)}$$

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-8, which applies when a mixing zone may be granted for a metal with criteria expressed as dissolved metal.

$$C_d = \left[\frac{CF \times C_e - C_u}{D} \right] + C_u \qquad \text{(Equation D-8)}$$

In equation D-8, C_e is expressed as total recoverable metal and C_d and C_u are expressed as dissolved metal. Equations D-5, D-7, and D-8 are the forms of the mass balance equation which were used to determine reasonable potential and calculate wasteload allocations.

B. Maximum Projected Effluent Concentration

Parameters with Water Quality-based Effluent Limits in the 1999 Permit

For parameters that were subject to water quality-based effluent limits in the 1999 permit and for which effluent are not necessary to meet Washington's water quality standards (chlorine, silver, and zinc) the EPA has used the maximum daily effluent limits in the 1999 permit as the maximum projected effluent concentrations. This allows the EPA to determine if the effluent limits in the 1999 permit are stringent enough to prevent the discharge from causing or contributing to excursions above water quality standards for these pollutants. If a discharge at the maximum daily limits in the 1999 permit did not have the reasonable potential to cause or contribute to excursions above water quality standards, the EPA retained the 1999 effluent limits under the anti-backsliding provisions of the Act (Section 402(o)).

Ammonia Limits Necessary to Meet Washington's Water Quality Standards

As explained in Appendix B, the EPA has determined that, independent of any concerns about the Coeur d'Alene facility's discharge of ammonia causing or contributing to excursions above water quality standards for ammonia in waters of the State of Idaho, the Coeur d'Alene facility's discharge of ammonia, in combination with other sources of oxygen-demanding pollution, has the reasonable potential cause or contribute to nonattainment of Washington's water quality standards for dissolved oxygen, from March – October. Therefore effluent limits are necessary for ammonia, from March – October.

The ammonia limit that is derived from Washington's water quality standards is expressed as a seasonal average mass limit. Because compliance with this limit is evaluated based on the average discharge over an 8-month period, this limit may not, by itself, prevent acute, near-field toxicity as required by the Idaho water quality standards. To ensure that the level of water quality to be achieved by the ammonia limits is derived from and complies with both Idaho's and Washington's water quality standards, the EPA has calculated average monthly and maximum daily water quality-based effluent limits for ammonia based on Idaho's water quality criteria for ammonia, as described in Appendix E.

During November – February, when the prior permit did not include effluent limits for ammonia and when ammonia limits are not necessary to ensure compliance with Washington's water quality standards, the EPA has used the procedure described under "Other Parameters," below, to determine the maximum projected effluent concentration for ammonia based on effluent data.

Other Parameters

To calculate the maximum projected effluent concentration for parameters not specifically discussed above, the EPA has used the procedure described in section 3.3 of the TSD,

"Determining the Need for Permit Limits with Effluent Monitoring Data." In this procedure, the 99th percentile of the effluent data is the maximum projected effluent concentration in the mass balance equation.

Since there are a limited number of data points available in most cases, the 99th percentile is calculated by multiplying the maximum reported effluent concentration by a "reasonable potential multiplier" (RPM). The RPM is the ratio of the 99th percentile concentration to the maximum reported effluent concentration. The RPM is calculated from the coefficient of variation (CV) of the data and the number of data points. The CV is defined as the ratio of the standard deviation of the data set to the mean, but when fewer than 10 data points are available, the TSD recommends making the assumption that the CV is equal to 0.6.

In addition to Section 3.3 of the TSD, the procedures for calculating a maximum projected effluent concentration from effluent data are described in detail in Appendix D of the fact sheet dated February 16, 2007. The results of the reasonable potential analysis are described below.

C. Results

Table 2 on the following page, summarizes the reasonable potential calculations.

D. References

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

Effluent Percentile value	99%																
				State Water Quality Standard		Max concentration at edge of...											
	Metal Criteria Translator as decimal	Metal Criteria Translator as decimal	Ambient Concentration (metals as dissolved)	Acute	Chronic	Acute Mixing Zone	Chronic Mixing Zone	LIMIT REQ'D?		Max effluent conc. measured (metals as total recoverable)	Coeff Variation		# of samples	Multiplier	Acute Dil'n Factor	Chronic Dil'n Factor	
Parameter	Acute	Chronic	ug/L	ug/L	ug/L	ug/L	ug/L		Pn	ug/L	CV	s	n				COMMENTS
Silver (October - June)	0.35	N/A		0.318	N/A	0.09	N/A	**NO**	0.958	3.30	1.43	1.06	107	1.88	25.0	N/A	25% MZ, No chronic criterion for Ag
Silver (July - Sept)	0.35	N/A		0.318	N/A	0.15	N/A	**NO**	0.958	3.30	1.43	1.06	107	1.88	14.5	N/A	25% MZ, No chronic criterion for Ag
Silver, Prev. Lim. (Oct - June)	0.35	N/A		0.318	N/A	0.45	N/A	**YES**	0.958	31.90	1.43	1.06	107	1.00	25.0	N/A	25% MZ, No chronic criterion for Ag
Cadmium (EOP)	0.93	0.90		1.69	0.67	0.25	0.24	**NO**	0.955	0.21	0.43	0.41	101	1.29	1	1	RW Impaired; no MZ
Zinc (EOP)	0.88	0.88		148	149	58.5	58.5	**NO**	0.958	60.5	0.15	0.15	107	1.10	1	1	RW Impaired; no MZ
Zinc (EOP, prev. lim.)	0.88	0.88		148	149	177	177	**YES**	N/A	201	N/A	N/A	N/A	1.00	1	1	RW Impaired; no MZ
Lead (EOP)	0.15	0.15		80.8	3.1	0.58	0.58	**NO**	0.958	2.73	0.70	0.63	107	1.46	1	1	RW Impaired; no MZ
Copper (Oct - June)	0.86	0.88		4.61	3.47	0.54	0.48	**NO**	0.958	12.90	0.35	0.34	107	1.23	25.0	28.7	25% MZ
Copper (July - Sept)	0.86	0.88		4.61	3.47	0.94	0.96	**NO**	0.958	12.90	0.35	0.34	107	1.23	14.5	14.5	15% MZ
Chlorine (Oct - June Prev. Lim.)	1.00	1.00		11.0	19.0	15.62	13.57	**YES**	N/A	390	N/A	N/A	N/A	1.00	25.0	28.7	25% MZ
Chlorline (July - Sept. Prev. Lim.)	1.00	1.00		11.0	19.0	7.05	7.05	**NO**	N/A	102	N/A	N/A	N/A	1.00	14.5	14.5	25% MZ
NO2 + NO3	1.00	1.00			10.0		4.82	**NO**	0.215	12.4	0.60	0.55	3	5.62		14.5	25% MZ
Ammonia Nov. - Feb.	1.00	1.00		6.75	2.80	1.05	0.82	**NO**	0.994	34.0	0.43	0.41	795	0.92	29.8	38.2	25% MZ

Appendix E: WQBEL Calculations – Acute and Chronic Numeric Aquatic Life Criteria

The discussion explains how water quality-based effluent limits (WQBELs) in the draft permit were calculated based on Idaho's numeric water quality criteria for aquatic life uses. The calculations for all WQBELs based on aquatic life criteria are summarized in Tables 2 and 3, below.

A. Calculate the Wasteload Allocations (WLAs)

Wasteload allocations (WLAs) are calculated using the same mass balance equations used to calculate the concentration of the pollutant at the edge of the mixing zone in the reasonable potential analysis. These equations are explained in Appendix D. To calculate the wasteload allocations, the downstream concentration (C_d) is set equal to the acute or chronic water quality criterion and the equation is solved for the effluent concentration (C_e). The calculated C_e is the acute or chronic WLA. Equation D-6 is rearranged to solve for the WLA, becoming:

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

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. Therefore, 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 (CT), as shown in equation E-2.

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

Or, if no mixing zone is allowed, for metals with criteria expressed as the dissolved fraction:

$$C_e = WLA = C_d \div CT \qquad \text{(Equation E-3)}$$

Mixing Zones for Ammonia for March - October

In general, mixing zones for effluent limit calculations are the same as those used for the reasonable potential analysis and described in Appendix D.

A smaller mixing zone was used for acute criteria for ammonia, from March – October. Section 5.1.1 of EPA's *Water Quality Standards Handbook Second Edition* ("Handbook") states that mixing zones must be limited to an area or volume as small as practicable (EPA 1994). The City of Coeur d'Alene must reduce its effluent ammonia loads from current levels on a seasonal average basis, from March – October, in order to ensure compliance with water quality standards for dissolved oxygen (DO) in the State of Washington (see Appendix B). This reduction will also allow Coeur d'Alene to meet Idaho's water quality criteria for ammonia using a smaller mixing zone than would otherwise be necessary. The Handbook also states that the acute water quality criterion "should be met within 10 percent of the distance from the edge of the outfall structure to the edge of the mixing zone in any spatial direction." Based on the Handbook's recommendations, and given the fact that ammonia discharges must be reduced from current levels in order to meet Washington's water quality standards (as explained in Appendix B) the

effluent limit calculations for ammonia use a mixing zone for the acute ammonia criterion that uses 2.5% of the 1Q10 flow of the Spokane River. The chronic mixing zone for ammonia continues to be based on 25% of the 30Q10 flow of the Spokane River. This will ensure that the acute water quality criterion for ammonia is roughly 10% of the size of the chronic mixing zone, as recommended by the Handbook. The dilution factors for the ammonia mixing zones, for March – October, are shown in Table 1, below.

Table 1: Dilution Factors for Ammonia Effluent Limits based on Idaho WQS for March – October

Season	**1Q10 River Flow**	**30Q10 River Flow**	**Acute Mixing Zone** (% of critical flow)	**Chronic Mixing Zone** (% of critical flow)	**Acute Dilution Factor** (1Q10)	**Chronic Dilution Factor** (30Q10)
March – June	1350	2840	2.5%	25%	4.64	77.5
July – September	500	500	2.5%	25%	2.35	14.5
October	1020	1500	2.5%	25%	3.75	41.4

B. Basis for Expressing Effluent Limits for Toxic Parameters as Average Monthly and Maximum Daily Limits

In general, effluent limits for POTWs must be expressed as average monthly and average weekly limits (40 CFR 122.45(d)(2)). In order to prevent acute toxicity to aquatic life, the Technical Support Document for Water Quality-based Toxics Control ("TSD") recommends that effluent limits for pollutants which may be toxic to aquatic life be expressed as average monthly and maximum daily limits, because an average weekly limit has an averaging period that is too long to ensure that acute toxicity is prevented (see TSD at section 5.2.3). Similarly, the 272 lb/day seasonal average ammonia effluent limit that is required to meet Washington's water quality standards (see Appendix B) would not prevent short-term discharges of high loadings or concentrations of ammonia which could cause acute toxicity. Therefore, effluent limits for total residual chlorine, ammonia, silver, and zinc are therefore expressed as average monthly and maximum daily limits, based on the recommendations of Section 5.2.3 of the TSD.

C. Calculating the Average Monthly and Maximum Daily Effluent Limits

The statistical procedures for calculating of average monthly and maximum daily effluent limits from the wasteload allocations are described in Section 5.4 of the TSD and in Appendix G of the fact sheet dated February 16, 2007.

Although the reasonable potential analysis in Appendix D showed that a discharge at the 1999 permit's maximum daily limits for total residual chlorine for October – June could cause or contribute to excursions above water quality standards for chlorine, when the EPA re-calculated the effluent limits for chlorine using the procedure described below, the re-calculated effluent limits were less stringent than those in the 1999 permit (see Table 1, below). Therefore, the October – June chlorine effluent limits in the 1999 permit have been continued forward in accordance with the anti-backsliding provisions of the Clean Water Act (Section 402(o)).

D. Results

The results of the effluent limit calculations are summarized in Tables 2 and 3, on the following page.

E. References

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

EPA. 1994. *Water Quality Standards Handbook: Second Edition*. Environmental Protection Agency. Office of Water. Washington, DC. August 1994. EPA 823-B-94-005a.

Table 2: Effluent Limit Calculations for Chlorine, Zinc, and Silver

	Permit Limit Calculation Summary										Waste Load Allocation (WLA) and Long Term Average (LTA) Calculations						
	Acute Dil'n Factor	Chronic Dil'n Factor	Metal Criteria Translator	Metal Criteria Translator	Ambient Concentration	Water Quality Standard Acute	Water Quality Standard Chronic	Average Monthly Limit (AML)	Maximum Daily Limit (MDL)	Comments	WLA Acute	WLA Chronic	LTA Acute	LTA Chronic	Limiting LTA	Coeff. Var. (CV)	# of Samples per Month
PARAMETER			Acute	Chronic	*ug/L*	*ug/L*	*ug/L*	ug/L	ug/L		*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*decimal*	*n*
Chlorine (Oct - June)	24.97	28.74	1.00	1.00		19.00	11.00	**175**	**474**	**25% Mixing Zone**	474	316	146.0	162.0	146.0	0.63	30.00
Zinc	1.00	1.00	0.88	0.88		148	149	**135**	**168**	**EOP**	168	170	119.0	142.2	119.0	0.15	4.00
Silver (Oct - June > 4.2 mgd)	24.97	N/A	0.35	N/A		0.32		**8.01**	**22.5**	**25% Mixing Zone**	22	N/A	3.5	N/A	3.5	1.36	4.00

Table 3: Calculations for Ammonia Effluent Limits based on Idaho WQS

	Permit Limit Calculation Summary												Waste Load Allocation (WLA) and Long Term Average (LTA) Calculations						
	Acute Dil'n Factor	Chronic Dil'n Factor	Metal Criteria Translator	Metal Criteria Translator	Ambient Concentration	Water Quality Standard Acute	Water Quality Standard Chronic	Average Monthly Limit (AML)	Maximum Daily Limit (MDL)	Average Monthly Limit (AML)	Maximum Daily Limit (MDL)	Comments	WLA Acute	WLA Chronic	LTA Acute	LTA Chronic	Limiting LTA	Coeff. Var. (CV)	# of Samples per Month
PARAMETER			Acute	Chronic	*mg/L*	*mg/L*	*mg/L*	mg/L	mg/L	lb/day	lb/day		*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*decimal*	*n*
Ammonia March - June	4.64	77.48	1.00	1.00	0.10	6.75	2.17	**13.0**	**30.9**	**649**	**1547**	**2.5% MZ Acute 25% MZ Chronic**	30.9	161	9.9	84.8	9.9	0.60	12.00
Ammonia July - Sep	2.35	14.46	1.00	1.00	0.10	6.75	1.43	**6.59**	**15.7**	**330**	**786**	**2.5% MZ Acute 25% MZ Chronic**	15.7	19	5.0	10.2	5.0	0.60	12.00
Ammonia October	3.75	41.39	1.00	1.00	0.10	6.75	1.43	**10.5**	**25.0**	**525**	**1252**	**2.5% MZ Acute 25% MZ Chronic**	25.0	55	8.0	29.0	8.0	0.60	12.00

Appendix F: Effluent Limit Calculations for pH

The following table demonstrates how appropriate effluent limitations were determined for pH.

Table F-1: Effluent Limit Calculations for the Low pH Critical Condition

INPUT	Oct. – June	July – Sept.
DILUTION FACTOR AT MIXING ZONE BOUNDARY	25.0	14.5
UPSTREAM/BACKGROUND CHARACTERISTICS		
Temperature (deg C):	18.4	25.0
pH:	6.60	6.60
Alkalinity (mg CaCO3/L):	19.2	19.2
EFFLUENT CHARACTERISTICS		
Temperature (deg C):	17.2	17.2
pH:	**6.3**	**6.5**
Alkalinity (mg CaCO3/L):	150	150
OUTPUT		
1. IONIZATION CONSTANTS		
Upstream/Background pKa:	6.39	6.35
Effluent pKa:	6.40	6.40
2. IONIZATION FRACTIONS		
Upstream/Background Ionization Fraction:	0.62	0.64
Effluent Ionization Fraction:	0.44	0.56
3. TOTAL INORGANIC CARBON		
Upstream/Background Total Inorganic Carbon (mg CaCO3/L):	31.13	30.00
Effluent Total Inorganic Carbon (mg CaCO3/L):	339.95	269.85
CONDITIONS AT MIXING ZONE BOUNDARY		
Temperature (deg C):	18.35	24.46
Alkalinity (mg CaCO3/L):	24.44	28.24
Total Inorganic Carbon (mg CaCO3/L):	43.50	46.58
pKa:	6.39	6.35
pH at Mixing Zone Boundary:	**6.50**	**6.54**

Appendix G: Compliance Schedules and Interim Limits for New Water Quality-based Effluent Limits

A. Overview

In order to establish a compliance schedule in an NPDES permit, the permitting authority must make a reasonable finding that the permittee cannot comply with the new water quality-based effluent limit immediately upon the effective date of the final permit (see memorandum from Jim Hanlon to Alexis Strauss dated May 10, 2007). Compliance schedules may only be allowed if the State's water quality standards or implementing regulations allow for compliance schedules (see *In The Matter of Star-Kist Caribe, Inc*., 3 E.A.D. 172, 175, 177 (1990)). The State of Idaho has a compliance schedule authorizing provision which reads, "discharge permits for point sources may incorporate 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" (IDAPA 58.01.02.400.03). The State of Idaho has authorized compliance schedules for some of the new water quality-based effluent limits in the City of Coeur d'Alene permit in its draft Clean Water Act Section 401 certification of this permit.

The EPA has evaluated the historic performance of the Coeur d'Alene wastewater treatment plant to determine if the City could immediately comply with the new water quality-based effluent limits proposed in the draft permit. For those effluent limits that cannot be achieved immediately on the effective date of the final permit, the compliance schedule must comply with the regulatory requirement that compliance be achieved as soon as possible (40 CFR 122.47(a)(1)). The EPA has determined that the compliance schedules proposed in the draft permit require compliance as soon as possible, as explained below.

B. Immediate Achievability

In general, for each parameter for which a new water quality-based effluent limit is proposed, the EPA used two different methods to quantify the facility's current performance. The current performance was compared to the proposed new water quality-based effluent limits to determine if the facility could comply with the new water quality-based effluent limits immediately upon the effective date of the final permit. The methods used to evaluate the facility's current performance are described below.

In general, if the facility's current performance, as quantified by the two methods described below, showed that the facility could comply with the new water quality-based effluent limits immediately upon the effective date of the final permit, then no compliance schedule has been proposed in the draft permit. If effluent data demonstrate that the facility cannot comply with the effluent limits immediately upon the effective date of the final permit, then a schedule of compliance is appropriate and has been proposed in the draft permit.

Performance-based Effluent Limit Spreadsheet Method

This spreadsheet calculates performance-based effluent limits based on historical effluent data and the required sampling frequency. The spreadsheet is based upon the procedures of Appendix E of the *Technical Support Document for Water Quality-based Toxics Control* (EPA 1991).

Percentile Method

When individual sample results are available, the expected maximum monthly, weekly, and daily loadings or concentrations can be represented by percentiles. The expected maximum monthly average concentration or loading is that which can be achieved 11/12ths (92%) of the time, and the expected maximum weekly average and maximum daily concentration or loading is that which can be achieved 51/52nds (98%) and 364/365ths (99.7%) of the time, respectively. The EPA used this method of quantifying treatment plant performance in the *Municipal Nutrient Removal Technologies Reference Document* (EPA 2008). If less than 365 data points were available, the maximum individual sample was used for comparison with a proposed water quality-based maximum daily limit.

Results of Effluent Data Analysis

The results of the analysis are summarized in Table 1, below.

Table 1: Comparison of New Water Quality-based Effluent Limits to Historic Performance

New Water Quality-based Effluent Limit Parameter, Season, and Units	Proposed Limits		Current Performance				Limits Achievable Immediately?
	Avg. Monthly Limit	Max. Daily or Avg. Weekly Limit	PERFORMLIM Spreadsheet		Percentiles		
			Max. Month	Max. Day/ Week	Max. Month	Max. Day/Week	
$CBOD_5$, February – March (lb/day)[1]	295	472	188	302	201	239	**YES**
$CBOD_5$,April – October (lb/day)[1]	265	424	188	302	201	239	**YES**
Ammonia, March - June (lb/day)	649	1547	532	928	685	938	**NO**
Ammonia, July - September (mg/L)	6.59	15.7	14.9	20.9	10.6	18.3	**NO**
Ammonia, July - September (lb/day)	330	786	315	546	430	605	**NO**
Ammonia, October (lb/day)	525	1252	309	530	374	503	**YES**
Silver, October – June, Effluent Flow > 4.2 mgd (µg/L)	8.01	22.5	1.0	1.8	0.71	3.3	**YES**
Cadmium (lb/day)	0.0075	0.0094	0.0036	0.0048	0.0031	0.0035	**YES**
Lead (lb/day)	0.13	0.29	0.027	0.037	0.026	0.043	**YES**
Zinc (µg/L)	135	168	59	67	55.0	60.5	**YES**

Notes:
1. Year-round effluent data were used for comparison with the proposed $CBOD_5$ effluent limits. The $CBOD_5$ effluent load is relatively stable over time (coefficient of variation = 0.31).

Discussion of Results

<u>$CBOD_5$</u>

As shown in Table 1, above, both the percentile and performance-based limit spreadsheet calculations show that the Coeur d'Alene facility can comply with the new water quality-based

effluent limits for $CBOD_5$ immediately upon the effective date of the final permit. Therefore, no compliance schedule may be authorized for the new water quality-based $CBOD_5$ effluent limits.

Ammonia

As shown in Table 1, above, in general, the percentile and performance-based spreadsheet calculations indicate that the Coeur d'Alene facility cannot comply with the new water quality-based average monthly and maximum daily limits for ammonia that are proposed in the draft permit immediately upon the effective date of the final permit, except during October. From July-September, the performance-based limit spreadsheet indicates that the facility may be able to comply with the new water quality-based load limits for ammonia, but the percentile method indicates that it cannot. Furthermore, neither the performance-based limit spreadsheet nor the percentile method indicates that the facility can comply with the new water quality-based concentration limits for ammonia that apply from July – September. Therefore, the City cannot comply with these new water quality-based effluent limits for ammonia and, a compliance schedule is appropriate for the new water quality-based average monthly and maximum daily limits for ammonia, except during the month of October.

During October, both the percentile and performance-based limit spreadsheet methods indicate that the facility can comply with the new water quality-based average monthly and maximum daily limits immediately upon the effective date of the final permit. Therefore, no compliance schedule may be authorized for the average monthly and maximum daily ammonia limits that are in effect during October.

With respect to the new water quality-based seasonal average limit for ammonia, which is 272 lb/day from March – October, the City's average ammonia load from March – October is 365 lb/day, which is greater than the effluent limit. Therefore the City cannot comply with the new water quality-based seasonal average effluent limit for ammonia immediately upon the effective date of the final permit and a compliance schedule is appropriate for this effluent limit.

Cadmium, Lead, Silver and Zinc

As shown in Table 1, effluent data indicate that the Coeur d'Alene facility can comply with the new water quality-based effluent limits for cadmium, lead, silver and zinc immediately upon the effective date of the final permit. Therefore, no compliance schedule may be authorized for the new water quality-based cadmium, lead, silver and zinc effluent limits.

Phosphorus

The effluent limit for total phosphorus is a seasonal average of 3.17 lb/day. The current average phosphorus loading is 36.5 lb/day. Therefore the City cannot comply with the new water quality-based seasonal average effluent limit for total phosphorus immediately upon the effective date of the final permit and a compliance schedule is appropriate for this effluent limit.

Summary

The permittee can comply with all of the new water quality-based effluent limits in the draft permit, except for the new phosphorus limits and some of the new ammonia limits. Therefore, a compliance schedule is proposed for the new water quality-based phosphorus limits and the new water quality-based ammonia limits except for the average monthly and maximum daily ammonia loading limits for the month of October.

Interim Limits

Basis for Interim Limits

The federal regulation 40 CFR 122.47 states that "…if a permit establishes a schedule of compliance which exceeds 1 year from the date of permit issuance, the schedule shall set forth interim requirements and the dates for their achievement." The federal regulation 40 CFR 122.44(l)(1) states that "…when a permit is renewed or reissued, interim effluent limitations, standards or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit."

Therefore, the EPA has proposed interim effluent limits in the draft permit, which apply during the term of the compliance schedule, in order to ensure that the reissued permit does not authorize the discharge of ammonia or phosphorus in greater amounts than authorized by the previous permit, during the term of the compliance schedule.

Total Phosphorus

The previous permit states, "the average monthly effluent phosphorus loading (measured as total P) shall not exceed 15 percent of the average monthly influent loading (measured as total P) or 1 mg/l, whichever is greater." Thus, the prior permit has average monthly limits expressed in terms of concentration or removal rate (whichever is less stringent or results in a greater effluent load) but it lacks average weekly limits and limits expressed in terms of mass, both of which are required by federal regulations (40 CFR 122.45(d)(2), 122.45(f). Thus, the EPA has established mass limits and average weekly limits in order to comply with federal regulations.

The interim average monthly TP limit is 1 mg/L, which is the same as the final phosphorus concentration effluent limit in the previous permit. The EPA has calculated an average monthly mass limit for TP based on the design flow of the POTW (which is 6 mgd), based on 40 CFR 122.45(b)(1). The interim average monthly TP mass limit is 50 lb/day.

In order to ensure compliance with federal regulations requiring that, in general, effluent limits for POTWs are stated as average monthly and average weekly limits, the EPA has also established interim average weekly TP limits based on the average monthly limits, and a ratio that accounts for effluent variability within a month. The EPA has used the same ratio as the ratio between the technology-based average monthly and average weekly $CBOD_5$ limits (1.6:1). The EPA believes this ratio is representative of typical effluent variability for POTWs. Thus, the average weekly TP limits are 1.6 mg/L and 80 lb/day.

The draft permit proposes to delete the option for removal rate effluent limits that are less stringent than the concentration limits. The EPA believes that the 1 mg/L average monthly effluent limit is achievable by the facility.

The prior permit's phosphorus limits generally applied from March 1st through October 31st each year. The interim effluent limits for total phosphorus apply from February 1st through October 31st each year, which is the same season during which the final TP effluent limits will apply. Modeling has shown that discharges of TP at any time during this season can affect dissolved oxygen concentrations in Lake Spokane.

Ammonia

The interim effluent limits for ammonia, for July – September, are identical to the ammonia effluent limits in the prior permit, consistent with 40 CFR 122.41(l)(1). The EPA has determined

that these limits will ensure compliance with Idaho's water quality criteria for ammonia after mixing with less than 25% of the critical low flows of the receiving water.

No interim ammonia effluent limits are proposed for March – June. The prior permit did not include any effluent limits for ammonia during this season.

C. As Soon as Possible

In its draft CWA Section 401 certification, the State of Idaho authorized a schedule of compliance which requires compliance with the draft permit's new total phosphorus limits and the new total ammonia as N effluent limits (except for the average monthly and maximum daily limits in effect during October) not later than 10 years after the effective date of the final permit.

Federal regulations require that compliance schedules in NPDES permits "shall require compliance as soon as possible." The draft certification states that the authorized compliance schedule "provides the permittee a reasonable amount of time to achieve the final effluent limitations 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."

The EPA agrees with the State of Idaho's finding that the 10-year schedule of compliance requires compliance with the new water quality-based effluent limits for total phosphorus and ammonia as soon as possible. The City's planned schedule for completion of the necessary plant upgrades to ensure compliance with effluent limits is provided in the City's *Phase 5 Program Schedule*, updated on December 30, 2011. The *Phase 5 Program Schedule* explains that the City must undertake several subtasks before it is able to comply with the new water quality-based phosphorus and ammonia limits in the draft permit, including:

- Funding (either a bond election or a judicial confirmation).
- Property acquisition and land use adjustments.
- Sewer rate study and financing plan.
- Phased construction and optimization of advanced treatment facilities:
    - Completion of tankage and 1 mgd of tertiary membrane filtration (TMF) capacity by late 2013 (Phase 5C.1)
    - 1 year of assessment of the performance of the 1 mgd TMF system
    - Design and construction of an additional 3 mgd of TMF capacity (4 mgd total TMF capacity), to be completed by early 2019 (Phase 5C.2).
    - Two years of optimization of the 4 mgd TMF system, to be completed by early 2021.
    - Design and construct an additional 2 mgd of TMF capacity (6 mgd total, phase 5C.3) in parallel with phase 5C.2). Construction will be completed in 2021; full compliance will be achieved after two years of optimization, in 2023, or 10 years after the effective date of the final permit.

The *Phase 5 Program Schedule* explains that, since current wastewater flows are less than 4 mgd, incremental implementation of the TMF improvements is appropriate. The incremental implementation will reduce the City's costs and allow the City to evaluate the performance of the improvements before committing to further and more costly improvements.

D. References

City of Coeur d'Alene Wastewater Department. *5 Program Schedule.* February 26, 2008. Updated December 30, 2011.

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

EPA. 2008. *Municipal Nutrient Removal Technologies Reference Document*. US Environmental Protection Agency. Office of Wastewater Management, Municipal Support Division, Municipal Technology Branch. The EPA 832-R-08-006. September 2008.

Appendix H: Draft Clean Water Act Section 401 Certification