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Fact Sheet

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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 Idaho Falls
Wastewater Treatment Plant

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

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

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

Idaho Department of Environmental Quality
900 N. Skyline, Suite B
Idaho Falls, ID 83402
(208) 528-2650

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

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

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

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

The fact sheet and draft permits are also available at:

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

Idaho Department of Environmental Quality
900 N. Skyline, Suite B
Idaho Falls, ID 83402
(208) 528-2650

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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
AWL	Average Weekly Limit
BE	Biological Evaluation
BOD_5	Biochemical oxygen demand, five-day
BMP	Best Management Practices
ºC	Degrees Celsius
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
CV	Coefficient of Variation
CWA	Clean Water Act
DMR	Discharge Monitoring Report
DO	Dissolved oxygen
EFH	Essential Fish Habitat
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
IC	Inhibition Concentration
IDEQ	Idaho Department of Environmental Quality
I/I	Infiltration and Inflow
lbs/day	Pounds per day
LTA	Long Term Average
mg/L	Milligrams per liter
ML	Minimum Level
µg/L	Micrograms per liter
mgd	Million gallons per day
MDL	Maximum Daily Limit or Method Detection Limit
N	Nitrogen
NOAA	National Oceanic and Atmospheric Administration

NOEC	No Observable Effect Concentration
NPDES	National Pollutant Discharge Elimination System
OWW	Office of Water and Watersheds
O&M	Operations and maintenance
POTW	Publicly owned treatment works
QAP	Quality assurance plan
RP	Reasonable Potential
RPM	Reasonable Potential Multiplier
RWC	Receiving Water Concentration
SS	Suspended Solids
s.u.	Standard Units
TKN	Total Kjeldahl Nitrogen
TMDL	Total Maximum Daily Load
TRC	Total Residual Chlorine
TRE	Toxicity Reduction Evaluation
TSD	Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001)
TSS	Total suspended solids
TU_c	Toxic Units, Chronic
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
WET	Whole Effluent Toxicity
WQBEL	Water quality-based effluent limit
WQS	Water Quality Standards
WWTP	Wastewater treatment plant

I. Applicant

A. General Information

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

City of Idaho Falls
Wastewater Treatment Plant
NPDES Permit # ID0021261

Physical Address:
4055 Glen Koester Road
Idaho Falls, ID 83402

Mailing Address:
P.O. Box 50220
Idaho Falls, ID 83405

Contact: Chad Stanger, Public Works Director

II. Facility Information

A. Treatment Plant Description

The City of Idaho Falls owns, operates, and has maintenance responsibility for the Idaho Falls wastewater treatment plant, which treats domestic sewage from local residents and commercial establishments. The Idaho Falls pollution control plant is designed to provide secondary treatment to 17 mgd of wastewater.

Raw sewage entering the headworks of the treatment plant undergoes fine screening and grit removal before flowing to the primary clarifier, where heavier solids and floatable materials are removed. The effluent from the primary clarifier is pumped to the filter tower, where it undergoes secondary treatment. Effluent from the filter tower flows to the aeration basins where it undergoes additional secondary treatment. Effluent from the aeration basins flows to the secondary clarifiers. The majority of the biological sludge that settles in the secondary clarifiers is returned to the filter tower and aeration basins. The secondary effluent from the clarifiers is disinfected in chlorine contact chambers, then dechlorinated and discharged to the Snake River through Outfall 001.

Primary sludge and scum and thickened waste secondary sludge is treated in anaerobic sludge digesters, stored in either sludge drying beds or the sludge storage lagoons, and ultimately disposed through land application. A process flow diagram is provided in Appendix A.

B. Background Information

The most recent NPDES permit for the pollution control plant was issued on April 17, 2001, became effective on May 21, 2001 and expired on May 22, 2006. An NPDES application for permit reissuance was submitted by the city on November 29, 2005. EPA determined that the application was timely and complete. Therefore, pursuant to 40 CFR 122.6, the permit has been

administratively extended and remains fully effective and enforceable. The first NPDES permit was issued to this facility in October 1974.

A map has been included in Appendix B which shows the location of the treatment plant.

III. Receiving Water

This facility discharges to the Snake River.

A. Low Flow Conditions

The *Technical Support Document for Water Quality-Based Toxics Control* (hereafter referred to as the TSD) (EPA, 1991) and Section 210 of 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 WQS state that WQBELs intended to protect aquatic life uses should be based on the lowest seven-day average flow rate expected to occur once every ten years (7Q10) for chronic criteria and the lowest one-day average flow rate expected to occur once every ten years (1Q10) for acute criteria. Because the chronic criterion for ammonia is a 30-day average concentration not to be exceeded more than once every three years, EPA has used the 30B3 for the chronic ammonia criterion instead of the 7Q10. The 30B3 is a biologically-based flow rate designed to ensure an excursion frequency of no more than once every three years for a 30-day average flow rate. For human health criteria, the Idaho water quality standards recommend the 30Q5 flow rate for non-carcinogens, and the harmonic mean flow rate for carcinogens.

The 1Q10, 7Q10, 30B3, 30Q5, and harmonic mean flows are 1,170; 1,400; 1,840; 1,900 and 3,940 CFS, respectively. These flows reflect the sum of flows measured in the Snake River above Eagle Rock near Idaho Falls (USGS station #13057155) and the Great Western Spillback (USGS station #13057132).

B. Water Quality Standards

Overview

Section 301(b)(1)(C) of the CWA requires the development of limitations in permits necessary to meet water quality standards. Federal regulations at 40 CFR 122.4(d) require that the conditions in NPDES permits ensure compliance with the water quality standards of all affected States. A State's water quality standards are composed of use classifications, numeric and/or narrative water quality criteria, and an anti-degradation policy. The use classification system designates the beneficial uses (such as domestic water supply, contact recreation, and aquatic life) that each water body is expected to achieve. The numeric and/or narrative water quality criteria are the criteria deemed necessary by the State to support the beneficial use classification of each water body. The anti-degradation policy represents a three-tiered approach to maintain and protect various levels of water quality and uses.

This facility discharges to the Snake River in the Idaho Falls subbasin (USGS HUC 17040201). In this reach, the Snake River is designated for the uses of cold water aquatic life, salmonid spawning, domestic water supply, and primary contact recreation (IDAPA 58.01.02.150.03).

Water quality criteria designed to protect these beneficial uses appear in Sections 210, 250, and 251 of the Idaho Water Quality Standards.

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). The WQS state, in Sections 252.02, 252.03, and 253 that these uses are to be protected by narrative criteria which appear in Section 200. These narrative criteria state that all surface waters of the State shall be free from hazardous materials; toxic substances; deleterious materials; radioactive materials; floating, suspended or submerged matter; excess nutrients; oxygen-demanding materials; and sediment in concentrations which would impair beneficial uses. The WQS also state, in Section 252.02 that the criteria from *Water Quality Criteria 1972*, also referred to as the "Blue Book" (EPA-R3-73-033) can be used to determine numeric criteria for the protection of the agricultural water supply use.

Antidegradation

Overview

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 fact that the State of Idaho has not identified methods for implementing its antidegradation policy does not necessarily prevent EPA from establishing such permit conditions.

The City of Idaho Falls NPDES permit contains limits as stringent as necessary to ensure compliance with all applicable water quality standards, including Idaho's antidegradation policy (IDAPA 58.01.02.051). As explained in detail below, the reissued permit ensures that "the existing in stream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected" consistent with the requirements of 40 CFR 131.12(a)(1) and IDAPA 58.01.02.051.01. Relative to the prior permit issued in 2001, the reissued permit does not allow lower water quality for those parameters where the receiving water quality "exceeds levels necessary to support propagation of fish, shellfish and wildlife and recreation in and on the water," therefore, the reissued permit maintains and protects the existing level of water quality, consistent with 40 CFR 131.12(a)(2) and IDAPA 58.01.02.051.02. Finally, the antidegradation policy for outstanding resource waters is inapplicable in this reissued permit because no waters of the State of Idaho are designated as "outstanding resource waters" (IDAPA 58.01.02.051.03).

The draft reissued permit ensures compliance with the State of Idaho's antidegradation policy and CWA regulations because the permit conditions ensure protection of existing uses and do not allow lower water quality relative to the prior permit. Under the circumstances of this draft reissued permit, EPA may issue an NPDES permit even though the State has not yet identified methods for implementing its antidegradation policy. In its antidegradation analysis below, EPA is applying a parameter-by-parameter approach in determining compliance with Idaho's antidegradation requirements.

EPA Antidegradation Analysis

Protection of Existing Uses (IDAPA 58.01.02.051.01 and 40 CFR 131.12(a)(1))

The segment of the Snake River that receives the Idaho Falls discharge has the following designated beneficial uses: cold water aquatic life; salmonid spawning; primary contact recreation; aesthetics; wildlife habitats; and domestic, agricultural, and industrial water supply. The effluent limits in the draft permit ensure compliance with applicable numeric and narrative water quality criteria. The numeric and narrative water quality criteria are set at levels that ensure protection of the designated uses. As there is no information indicating the presence of existing beneficial uses other than those that are designated the draft permit ensures a level of water quality necessary to protect the designated uses and, in compliance with IDAPA 58.01.02.051.01 and 40 CFR 131.12(a)(1), also ensures that the level of water quality necessary to protect existing uses is maintained and protected. If EPA receives information during the public comment period demonstrating that there are existing uses for which the Snake River is not designated, EPA will consider this information before issuing a final permit and will establish additional or more stringent effluent limitations if necessary to ensure protection of existing uses.

High Quality Waters (IDAPA 58.01.02.051.02 and 40 CFR 131.12(a)(2))

Idaho Falls discharges to a segment (assessment unit) of the Snake River that is considered high quality for all of the pollutants of concern. As such, the quality of the Snake River must be maintained and protected, unless it is deemed appropriate and necessary to allow a lowering of water quality (IDAPA 58.01.02.051.02, 40 CFR 131.12(a)(2)).

All of the effluent limits in the reissued permit are as stringent as or more stringent than the corresponding limits in the prior (2001) permit, with the sole exception of fecal coliform. Because the limits are as stringent as or more stringent than the corresponding limits in the prior permit, the reissued permit will not allow lower water quality for pollutants that were limited in the prior permit. Furthermore, as explained on Page 13, below, the fecal coliform effluent limits in the 2001 permit have been replaced with E. coli limits that will not allow lower water quality relative to the prior permit.

As to those pollutants present in the discharge without effluent limits in both the reissued permit and the prior permit, there is no factual basis to expect that those pollutants will be discharged in greater amounts under the reissued permit than were authorized in the prior permit. Similarly, there is no factual basis to expect that the effluent contains any new pollutants that have not been discharged previously. EPA reached these conclusions because the permit application and the discharge monitoring report data indicate no changes in the design flow, influent quality or treatment processes that could result in a new or increased discharge of pollutants.

Phosphorus is present in the discharge and did not have effluent limits in the prior permit, but the reissued permit includes effluent limits for phosphorus. The new effluent limits for phosphorus will not allow lower water quality relative to the prior permit because the new limits ensure that the facility's effluent phosphorus load is not increased above current levels, as described in Appendix F.

Summary

As explained above, the effluent limits in the draft reissued permit are adequately stringent to ensure that existing uses are maintained and protected, in compliance with IDAPA 58.01.02.051.01 and 40 CFR 131.12(a)(1).

With the sole exception of fecal coliform, the effluent limits in the reissued permit are as stringent as or more stringent than the corresponding limits in prior permit for all parameters, and the fecal coliform limits in the prior permit have been replaced with E. coli limits that do not allow lower water quality. Furthermore, the reissued permit will not authorize an increased discharge of any pollutants that were not subject to effluent limits under the prior permit.

The reissuance of the City of Idaho Falls NPDES permit will therefore not allow lower water quality relative to the prior permit, in compliance with IDAPA 58.10.02.051.02 and 40 CFR 131.12(a)(2). Consequently, there is no need for the State of Idaho to make a finding that "allowing lower water quality is necessary to accommodate important economic or social development" under IDAPA 58.01.02.051.02. Under these circumstances, EPA may issue an NPDES permit even though the State of Idaho has not yet identified methods for implementing its antidegradation policy.

IV. Effluent Limitations

A. Basis for Effluent Limitations

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

B. Proposed Effluent Limitations

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

1. The permittee must not discharge floating, suspended, or submerged matter of any kind in amounts causing nuisance or objectionable conditions or that may impair designated beneficial uses.
2. Removal Requirements for BOD_5 and TSS: The monthly average effluent concentration must not exceed 15 percent of the monthly average influent concentration. Percent removal of BOD_5 and TSS must be reported on the Discharge Monitoring Reports (DMRs). For each parameter, the monthly average percent removal must be calculated from the arithmetic mean of the influent values and the arithmetic mean of the effluent values for that month. Influent and effluent samples must be taken over approximately the same time period.
3. The permittee must not discharge floating, suspended, or submerged matter of any kind in amounts causing nuisance or objectionable conditions or that may impair designated beneficial uses of the receiving water.

Table 1 (below) presents the proposed numeric effluent limits.

C. Basis for Deleting Fecal Coliform Effluent Limits

The draft permit proposes to delete the previous permit's effluent limits for fecal coliform. Effluent limitations for all other pollutants are as stringent as or more stringent than those in the 2001 permit.

Statutory Prohibitions on Backsliding

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

Table 1: Proposed Effluent Limits

Parameter	Units	Effluent Limits		
		Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit
Five-Day Biochemical Oxygen Demand (BOD_5)	mg/L	30	45	—
	lb/day	4250	6380	—
	% removal	85% (min)	—	—
Total Suspended Solids (TSS)	mg/L	30	45	—
	lb/day	4250	6380	—
	% removal	85% (min)	—	—
E. Coli	#/100 ml	126[1]	—	406[2]
pH	s.u.	6.5 – 9.0		
Total Residual Chlorine	µg/L	54	—	95
	lb/day	7.6	—	13.5
Total Ammonia as N (June – September)	mg/L	1.1	—	3.3
	lb/day	160	—	470
Total Ammonia as N (October – May)	mg/L	1.8	—	5.7
	lb/day	260	—	810
Total Phosphorus as P	lb/day	388	582	—

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

Section 303(d)(4) of the CWA states that, for water bodies where the water quality meets or exceeds the level necessary to support the water body's designated uses, WQBELs may be revised as long as the revision is consistent with the State's antidegradation policy. Additionally, Section 402(o)(2) contains exceptions to the general prohibition on backsliding in 402(o)(1). According to the *U.S. EPA NPDES Permit Writers' Manual* (EPA-833-B-96-003) the 402(o)(2)

exceptions are applicable to WQBELs (except for 402(o)(2)(B)(ii) and 402(o)(2)(D)) and are independent of the requirements of 303(d)(4). Therefore, WQBELs may be relaxed as long as either the 402(o)(2) exceptions or the requirements of 303(d)(4) are satisfied.

Even if the requirements of Sections 303(d)(4) or 402(o)(2) are satisfied, Section 402(o)(3) prohibits backsliding which would result in violations of water quality standards or effluent limit guidelines.

Fecal Coliform

The draft permit proposes to delete the fecal coliform limits in the previous permit, while retaining the E. coli limits from the previous permit. The Snake River, at the point of discharge has not been listed on Idaho's "303(d) list" as not attaining or not being expected to attain water quality standards for bacteria. When water quality standards for the relevant pollutant are being attained, Section 303(d)(4)(B) of the Act states that water quality-based effluent limits may be revised if the revision is consistent with the State's antidegradation policy.

All of the effluent limits in the reissued permit are as stringent as or more stringent than the corresponding limits in the prior (2001) permit, however, the 2001 permit's fecal coliform limits have been replaced with E. coli limits. In order to reflect a change to the WQS, the draft permit proposes to change the bacteria limits from fecal coliform to E. coli limits. The draft permit, like the previous permit, includes "criteria end-of-pipe" effluent limits for bacteria, in order to protect contact recreation beneficial uses in the receiving water. In 1986, EPA updated its criteria to protect recreational use of water recommending an E. coli criterion as a better indicator of bacteria levels that may cause gastro-intestinal distress in swimmers than fecal coliform. IDEQ subsequently changed its bacteria criterion from fecal coliform to E. coli. The new water quality criteria and effluent limits simply use the indicator organism currently specified in the Idaho water quality standards (E. coli). E. coli is a better indicator of bacteria levels that may cause gastro-intestinal distress in swimmers, and the new E. coli limits provide the same level of protection for the beneficial use of primary contact recreation as was provided by the fecal coliform effluent limits in the previous permit. Therefore, the change from fecal coliform limits to E. coli limits will not allow lower water quality relative to the 2001 permit. Because the change from fecal coliform limits to E. coli limits will not allow lower water quality relative to the 2001 permit, this change is consistent with Idaho's antidegradation policy (IDAPA 58.01.02.051).

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

Because the E. coli limits apply current water quality criteria at the end-of-pipe, the effluent limits are derived from and comply with water quality standards for E. coli. The Idaho Department of Environmental Quality has stated in its draft Clean Water Act Section 401 certification that the deletion of the fecal coliform limits and the inclusion of E. coli limits complies with State water quality standards. The secondary treatment technology-based effluent limits do not include effluent limits for bacteria. Because the effluent limits will continue to ensure that water quality standards are met and do not violate the secondary treatment effluent limits, the limits comply with Section 402(o)(3) of the CWA.

V. Monitoring Requirements

A. Basis for Effluent and Surface Water Monitoring

Section 308 of the CWA and federal regulation 40 CFR 122.44(i) require monitoring in permits to determine compliance with effluent limitations. Monitoring may also be required to gather effluent and surface water data to determine if additional effluent limitations are required and/or to monitor effluent impacts on receiving water quality. The permit also requires the permittee to perform effluent monitoring required by parts B.6 and D of the NPDES Form 2A application, so that these data will be available when the permittee applies for a renewal of its NPDES permit.

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

B. Effluent Monitoring

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

Table 2, below, presents the proposed effluent monitoring requirements for the City of Idaho Falls WPCP. The sampling location must be after the last treatment unit and prior to discharge to the receiving water. If no discharge occurs during the reporting period, "no discharge" shall be reported on the DMR.

Monitoring Changes from the Previous Permit

Monitoring frequencies for certain parameters have been reduced, relative to the previous permit. The reductions in monitoring frequency are based on EPA's *Interim Guidance for Performance-based Reduction of NPDES Permit Monitoring Frequencies* (April 19, 1996). Table 3, below, summarizes the reductions in monitoring frequency that were made based on the guidance.

Table 2: Effluent Monitoring Requirements

Parameter	Units	Sample Location	Sample Frequency	Sample Type
Flow	mgd	Influent or Effluent	Continuous	recording
BOD_5	mg/L	Influent & Effluent	3/week	24-hour composite
	lb/day	Influent & Effluent		calculation[1]
	% Removal	% Removal	1/month	calculation[2]
TSS	mg/L	Influent & Effluent	3/week	24-hour composite
	lb/day	Influent & Effluent		calculation[1]
	% Removal	% Removal	1/month	calculation[2]
pH	standard units	Effluent	Daily	grab
E. Coli	#/100 ml	Effluent	5/month	grab
Total Residual Chlorine	µg/L	Effluent	Daily	grab
	lb/day	Effluent		calculation[1]
Total Ammonia as N	mg/L	Effluent	Daily	24-hour composite

Table 2: Effluent Monitoring Requirements				
Parameter	**Units**	**Sample Location**	**Sample Frequency**	**Sample Type**
	lb/day	Effluent		calculation[1]
Total Phosphorus	mg/L	Influent & Effluent	3/week	24-hour composite
	lb/day	Effluent		calculation
Alkalinity	mg/L as $CaCO_3$	Effluent	1/month	24-hour composite
Arsenic	µg/L	Influent & Effluent	2/year[4]	24-hour composite
Cadmium	µg/L	Influent & Effluent	2/year[4]	24-hour composite
Chromium VI	µg/L	Influent & Effluent	2/year[4]	24-hour composite
Chromium, Total	µg/L	Influent & Effluent	2/year[4]	24-hour composite
Copper	µg/L	Influent & Effluent	1/month	24-hour composite
Cyanide	µg/L	Influent & Effluent	2/year[4]	24-hour composite
Dissolved Oxygen	mg/L	Effluent	1/month	grab
Hardness	mg/L as $CaCO_3$	Effluent	1/month	24-hour composite
Lead	µg/L	Influent & Effluent	2/year[4]	24-hour composite
Mercury	µg/L	Influent & Effluent	2/year[4]	24-hour composite
Nickel	µg/L	Influent & Effluent	2/year[4]	24-hour composite
Nitrate	mg/L	Effluent	1/month	24-hour composite
Nitrite	mg/L	Effluent	1/month	24-hour composite
Oil and Grease	mg/L	Effluent	1/month	grab
Orthophosphate	mg/L	Effluent	1/month	24-hour composite
Silver	µg/L	Influent & Effluent	2/year[4]	24-hour composite
Temperature	ºC	Effluent	Daily	grab
Total Dissolved Solids	mg/L	Effluent	1/month	24-hour composite
Total Kjeldahl Nitrogen	mg/L	Effluent	1/month	24-hour composite
Zinc	µg/L	Influent & Effluent	2/year[4]	24-hour composite
NPDES Application Form 2A Expanded Effluent Testing	---	Effluent	3x/5 years	---
Whole Effluent Toxicity (WET)	TU_C	Effluent	2/year	24-hour composite

Notes:
1. Loading is calculated by multiplying the concentration in mg/L by the flow in mgd and a conversion factor of 8.34. If the concentration is measured in µg/L, the conversion factor is 0.00834.
2. Percent removal is calculated using the following equation:
   (average monthly influent – average monthly effluent) ÷ average monthly influent.
3. The permittee must report the minimum effluent dilution ratio observed during the month.
4. Each sampling event must include three 24-hour composite samples taken over the course of a calendar week.

Table 3: Reductions in Monitoring Frequency Based on EPA Guidance			
Parameter	**Ratio of Long Term Average Concentration to Average Monthly Limit**	**Previous Permit (Baseline) Monitoring Frequency**	**Reduced Monitoring Frequency (see Guidance at Table 1, Page 5)**
BOD_5	46%	Daily	3 times per week
TSS	32%	Daily	3 times per week
Chlorine	18%	Four grab samples per day	One grab sample per day[1]
E. Coli	9%	Daily	5 times per month[2]

Notes:
1. The previous permit's monitoring frequency for chlorine of four times per day is not among the choices for the baseline monitoring frequency in Table 1 of the guidance. However, the recommended reduced monitoring frequency for facilities monitoring four times per week, with a long-term average to average monthly limit ratio of less than 25%, is once per week. This recommendation for reductions in weekly monitoring frequency has been applied to the daily monitoring frequency for Idaho Falls.
2. The recommended reduced monitoring frequency in Table 1 of the guidance is once per week. However, the frequency has been set at five times per month, for consistency with Idaho's water quality criteria for E. Coli. This is roughly the same frequency, on average, as once-per-week.

C. Surface Water Monitoring

Table 4 presents the proposed surface water monitoring requirements for the draft permit. The City of Idaho Falls should continue receiving water monitoring at the established locations. Surface water monitoring results must be submitted with the DMRs for the last month of each quarter. EPA proposes to discontinue flow monitoring in the receiving water, because both the Snake River and the Great Western Spillback are gauged by the USGS, at station numbers 13057155 and 13057132, respectively.

Table 4: Receiving Water Monitoring Requirements

Parameter (units)	Sample Locations	Sample Frequency	Sample Type
Alkalinity (mg/L as $CaCO_3$)	Upstream and Downstream	Quarterly[2]	Composite
Copper, Dissolved	Upstream and Downstream	Quarterly[2]	Composite
Dissolved Oxygen (mg/L)	Upstream and Downstream	Quarterly[2]	Composite
Hardness	Upstream and Downstream	Quarterly[2]	Composite
Mercury	Upstream and Downstream	Quarterly[2]	Composite
Nitrate as N	Upstream and Downstream	Quarterly[2]	Composite
Nitrite as N	Upstream and Downstream	Quarterly[2]	Composite
Orthophosphate as P	Upstream and Downstream	Quarterly[2]	Composite
pH (s.u.)	Upstream and Downstream	Quarterly[2]	Composite
Temperature, (ºC)	Upstream and Downstream	Quarterly[2]	Composite
Total Ammonia as N (mg/L)	Upstream and Downstream	Quarterly[2]	Composite
Total Kjeldahl Nitrogen	Upstream and Downstream	Quarterly[2]	Composite
Total Phosphorus as P	Upstream and Downstream	Quarterly[2]	Composite

1. Monitoring for copper, lead, silver and zinc in the receiving water must be in dissolved metal.
2. Quarters are defined as January through March, April through June, July through September and October though December.

VI. Sludge (Biosolids) Requirements

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

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

VII. Other Permit Conditions

A. Quality Assurance Plan

The federal regulation at 40 CFR 122.41(e) requires the permittee to develop procedures to ensure that the monitoring data submitted is accurate and to explain data anomalies if they occur. The City of Idaho Falls is required to update the Quality Assurance Plan for the wastewater treatment plant within 60 days of the effective date of the final permit. The Quality Assurance Plan shall consist of standard operating procedures the permittee must follow for collecting, handling, storing and shipping samples, laboratory analysis, and data reporting.

B. Operation and Maintenance Plan

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

C. Design Criteria

The permit retains the design criteria requirements from the previous permit. This provision requires the permittee to compare the annual average influent flow to the facility's design flow, and to prepare a facility plan for maintaining compliance with NPDES permit effluent limits when the annual average flow exceeds 85% of the design flow of 17 mgd (or 14.5 mgd).

D. Pretreatment Requirements

The proposed permit requires the City to 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 EPA, and any additional or more stringent requirements imposed by the City of Idaho Falls as part of its approved pretreatment program or sewer use ordinance (e.g. local limits).

E. Standard Permit Provisions

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

VIII. Other Legal Requirements

A. Endangered Species Act

The Endangered Species Act requires federal agencies to consult with National Oceanic and Atmospheric Administration Fisheries (NOAA Fisheries) and the U.S. Fish and Wildlife Service

(USFWS) if their actions could beneficially or adversely affect any threatened or endangered species. EPA has determined that the issuance of this NPDES permit will have no effect on threatened or endangered species. Therefore, consultation is not required for this action. However, EPA will notify USFWS and NOAA Fisheries of the issuance of this draft permit and will consider any comments made by the Services prior to issuance of a final permit. See Appendix G of this fact sheet for more information.

B. Essential Fish Habitat

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

C. State Certification

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

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 EPA-approved state 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, 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 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. Permit Expiration

The permit will expire five years from the effective date.

IX. References

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

EPA. 1996. *Interim Guidance for Performance-based Reduction of NPDES Permit Monitoring Frequencies.*

Appendix A: Facility Information

General Information

NPDES ID Number:	ID0021261
Physical Address:	4055 Glen Koester Road Idaho Falls, ID 83402
Mailing Address:	P.O. Box 50220 Idaho Falls, ID 83405
Facility Background:	The previous NPDES permit for this facility was issued on April 17, 2001, became effective on May 21, 2001, and expired on May 22, 2006. The 2001 permit has been administratively extended as provided for in 40 CFR 122.6. The first NPDES permit issued to this facility was issued on October 18, 1974.

Facility Information

Type of Facility:	Publicly Owned Treatment Works (POTW)
Treatment Train:	Sewage shredder, grit chamber, primary clarifier, activated biofilter tower, aeration basins, secondary clarifiers, chlorine contact chambers and dechlorination.
Flow:	Design flow is 17 mgd.
Outfall Location:	latitude 43° 27' 46" N; longitude 112° 4' 8" W

Receiving Water Information

Receiving Water:	Snake River
Watershed:	Idaho Falls (HUC 17040201)
Beneficial Uses:	Cold water aquatic life, salmonid spawning, domestic water supply, primary contact recreation, industrial and agricultural water supply, wildlife habitats, and aesthetics.

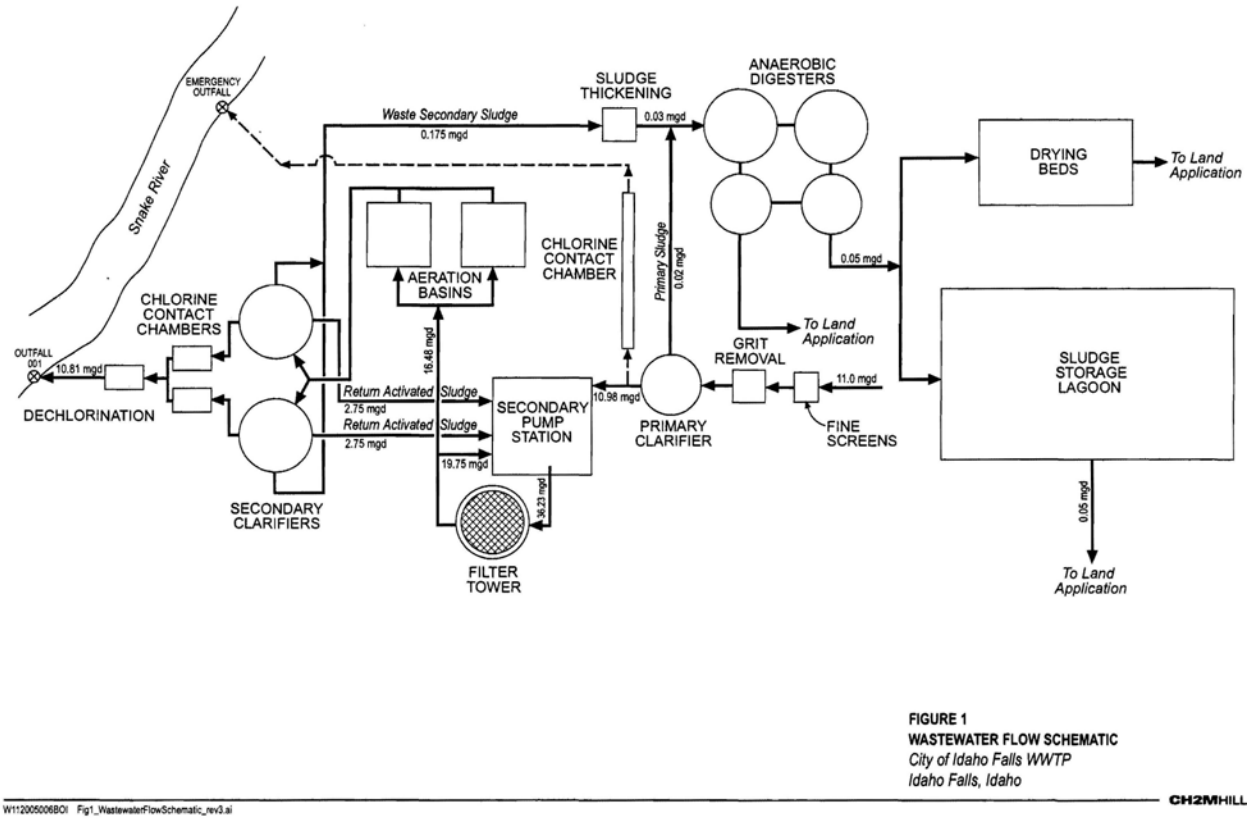
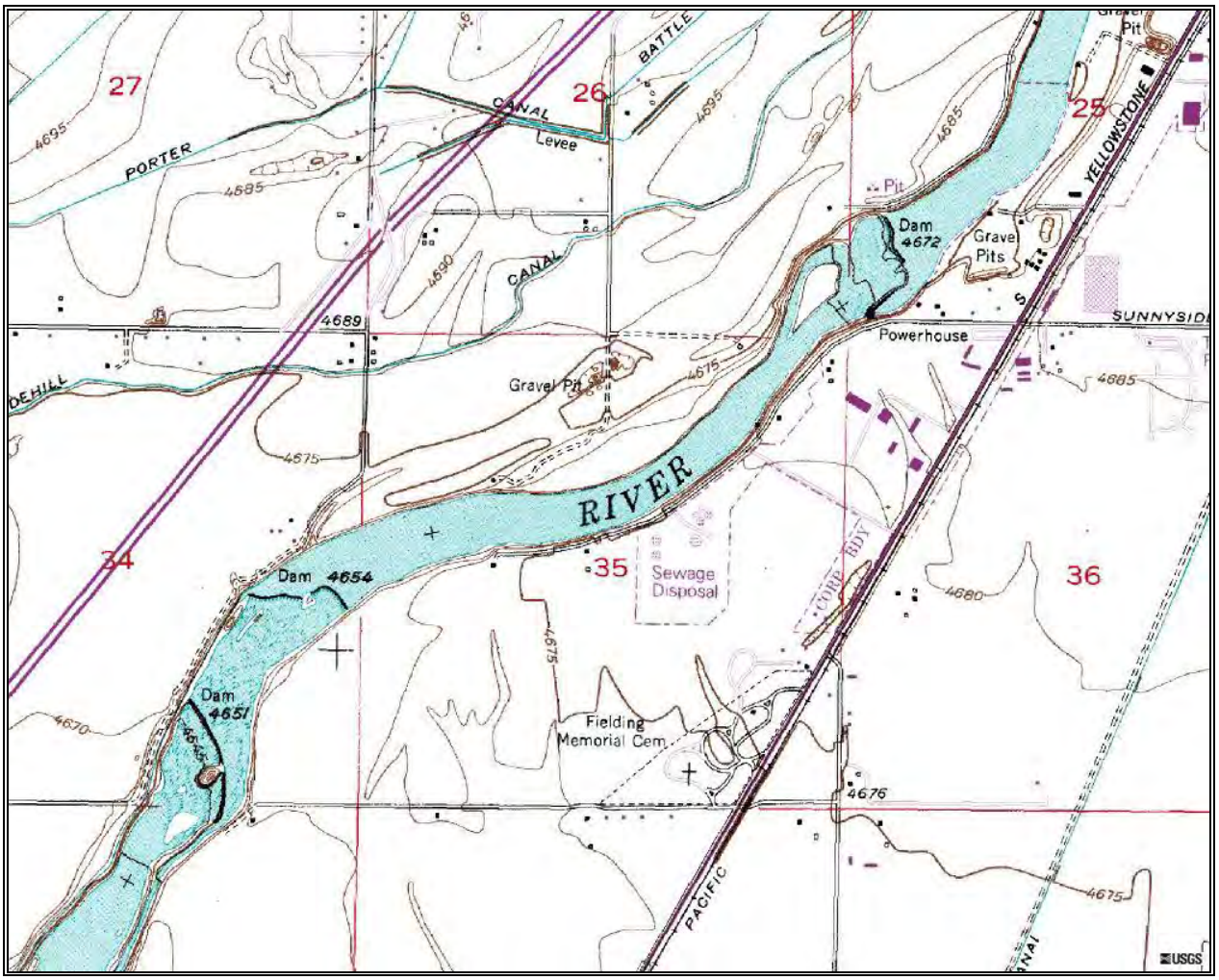


Figure A-1: Flow Diagram

Appendix B: Facility Map



Appendix C: Basis for Effluent Limits

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

A. Technology-Based Effluent Limits

Federal Secondary Treatment Effluent Limits

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

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

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

Chlorine

Chlorine is often used to disinfect municipal wastewater prior to discharge. The City of Idaho Falls pollution control plant uses chlorine disinfection.

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

EPA has determined that the technology-based effluent limits for BOD_5 and TSS are stringent enough to ensure compliance with Idaho's federally-approved water quality standards. More stringent water quality-based effluent limits are proposed for chlorine and pH.

Mass-Based Limits

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

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

B. Water Quality-based Effluent Limits

Statutory and Regulatory Basis

Section 301(b)(1)(C) of the CWA requires the development of limitations in permits necessary to meet water quality standards by July 1, 1977. Discharges to State or Tribal waters must also comply with limitations imposed by the State or Tribe as part of its certification of NPDES permits under section 401 of the CWA. Federal regulations at 40 CFR 122.4(d) prohibit the issuance of an NPDES permit that does not ensure compliance with the water quality standards of all affected States. The NPDES regulation (40 CFR 122.44(d)(1)) implementing Section 301(b)(1)(C) of the CWA requires that permits include limits for all pollutants or parameters which are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State or Tribal water quality standard, including narrative criteria for water quality, and that the level of water quality to be achieved by limits on point sources is derived from and complies with all applicable water quality standards.

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

Reasonable Potential Analysis

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

Mixing Zones

Sometimes it is appropriate to allow a small area of the receiving water to provide dilution of the effluent. These areas are called mixing zones. Mixing zone allowances will increase the mass loadings of the pollutant to the water body and will decrease treatment requirements. Mixing

[1] 8.34 is a conversion factor equal to the density of water in pounds per gallon

zones can be used only when there is adequate receiving water flow volume and when the receiving water meets the criteria necessary to protect the designated uses of the water body. Mixing zones must be authorized by IDEQ. Based on the previous permit, EPA's *Water Quality Standards Handbook: Second Edition*, and the draft certification, the water quality-based effluent limits in this permit (except pH and E. coli) have been calculated using a mixing zone. If IDEQ does not grant a mixing zone, the water quality-based effluent limits will be recalculated such that the criteria are met before the effluent is discharged to the receiving water.

Procedure for Deriving Water Quality-based Effluent Limits

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

In cases where a mixing zone is not authorized, either because the receiving water already exceeds the criterion, the receiving water flow is too low to provide dilution, or the State does not authorize one, the criterion becomes the WLA. Establishing the criterion as the wasteload allocation ensures that the permittee will not cause or contribute to an exceedance of the criterion. The following discussion details the specific water quality-based effluent limits in the draft permit.

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

C. Facility-Specific Water Quality-based Limits

Total Phosphorus

As described in Appendix F, EPA has determined that the discharge has the reasonable potential to cause or contribute to excursions above Idaho's narrative water quality criterion for nutrients (IDAPA 58.01.02.200.06). Therefore, EPA has proposed water quality-based effluent limits for total phosphorus in the draft permit.

Metals

The toxicities of some metals vary with the hardness of the water. Therefore, the water quality criteria for these metals also vary with hardness. Since toxicity decreases (and numeric water quality criteria increase) as hardness increases, EPA has used the 5th percentile as a worst-case assumption for ambient hardness. The use of downstream hardness is generally preferable to upstream hardness. In this case, the downstream hardness data are not statistically distinct from the upstream hardness data, therefore, both upstream and downstream hardness data have been considered in the calculation of the 5th percentile ambient hardness. The 5th percentile ambient hardness is 113 mg/L as $CaCO_3$. Effluent hardness data were not available.

The hardness-dependent water quality criteria for the metals of concern are expressed as dissolved metal. The dissolved fraction of the metal is the fraction that will pass through a 0.45-micron filter. However, the federal regulation at 40 CFR 122.45(c) requires that NPDES permit effluent limits must be expressed as total recoverable metal. Total recoverable metal is the concentration of the metal in an unfiltered sample. To develop effluent limits for total

recoverable metals which are protective of the dissolved metals criteria, "translators" are used in the equations to determine reasonable potential and derive effluent limits. Translators can either be site specific values or default values. EPA has published guidance related to the use of translators in NPDES permits in *The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion* (EPA 823-B-96-007, June 1996). In the absence of site specific translators, this guidance recommends the use of water quality criteria conversion factors as the default translators. Because site-specific translators were not available, EPA has used the conversion factors in the Idaho Water Quality Standards in the reasonable potential and effluent limit calculations for the City of Idaho Falls discharge. Tables C-2 and C-3, below, detail the calculations for water quality criteria for metals that have been detected in the City of Idaho Falls effluent (IDAPA 58.01.02.210).

The most stringent water quality criterion for arsenic is for the protection of human health, as opposed to aquatic life. The human health criterion for arsenic is 10 µg/L.

Table C-2: Aquatic Life Metals Criteria

Parameter	Equations for Metals Criteria (expressed as total recoverable)[1,2,3]		Equations or Values of Conversion Factors and Translators[4]	
	Acute	Chronic	Acute	Chronic
Chromium III	$e^{0.819[\ln(hardness)]+3.756}$	$e^{0.819[\ln(hardness)]+0.6848}$	0.316	0.860
Chromium VI	16.02	10.98	0.982	0.962
Copper	$e^{0.9422[\ln(hardness)]-1.464}$	$e^{0.8545[\ln(hardness)]-1.465}$	0.960	0.960
Lead	$e^{1.273[\ln(hardness)]-1.460}$	$e^{1.273[\ln(hardness)]-4.705}$	1.46203 - [ln(hardness)×1.45712]	
Silver	$e^{1.72[\ln(hardness)]-6.52}$	—	0.850	—
Zinc	$e^{0.8473[\ln(hardness)]+0.884}$	$e^{0.8473[\ln(hardness)]+0.884}$	0.978	0.986

Notes:
1. "e" is the exponential constant, approximately equal to 2.718
2. "ln" is the natural logarithm (log base "e")
3. Hardness is measured in mg/L as $CaCO_3$
4. Multiplying the results of the criteria equations by these conversion factors yields the dissolved criteria.

Table C-3: Metals Criteria Values as Dissolved Metal at 113 mg/L Hardness

Parameter	**Acute Criterion (µg/L)[1]**	**Chronic Criterion (µg/L)[1]**
Chromium III	630	82
Chromium VI	15.7	10.6
Copper	19.1	12.6
Lead	74	2.9
Silver	4.3	N/A
Zinc	130	131

EPA has determined that the discharge does not have reasonable potential to cause or contribute to violations of Idaho's water quality criteria for arsenic, chromium, copper, lead, silver, or zinc. See Appendix D for reasonable potential calculations for metals.

pH

The most stringent water quality criterion for pH is for the protection of aquatic life. The pH criteria for aquatic life uses state that the pH must be no less than 6.5 and no greater than 9.0 standard units (IDAPA 58.01.02.250.01.a). Mixing zones are generally not granted for pH, therefore the most stringent water quality criterion must be met before the effluent is discharged to the receiving water. The draft permit requires that the effluent have a pH of no less than 6.5 and no greater than 9.0 standard units. Effluent data indicate that the permittee will have no difficulty in complying with these effluent limits.

Ammonia

The Idaho water quality standards contain criteria for the protection of aquatic life from the toxic effects of ammonia. Because the Snake River is designated for salmonid spawning, EPA has applied ammonia criteria which are protective of salmonids, including early life stages. The criteria are dependent on pH and temperature, because the fraction of ammonia present as the toxic, un-ionized form increases with increasing pH and temperature. Therefore, the criteria become more stringent as pH and temperature increase. The following table details the equations used to determine water quality criteria for ammonia, and the values of these equations at the 95th percentile pH (for the entire year), which is 8.6 standard units, and the 95th percentile temperature observed in the Snake River upstream from the discharge, which is 18.4 ºC.

EPA has determined that the ammonia effluent limits in the previous permit will ensure compliance with Idaho's water quality criteria for ammonia. Therefore, the previous permit's ammonia effluent limits have been retained under the anti-backsliding provisions of the Clean Water Act (Section 402(o)). Maintaining the same ammonia limits as the previous permit ensures that the reissuance of the permit does not allow lower water quality for ammonia, relative to the prior permit. Thus, the ammonia limits also ensure compliance with Idaho's antidegradation policy (IDAPA 58.01.02.051.02).

Table C-4: Water Quality Criteria for Ammonia

	Acute Criterion[1]	Chronic Criterion[2]
Equations:	$\frac{0.275}{1+10^{7.204-\text{pH}}}+\frac{39}{1+10^{\text{pH}-7.204}}$	$\left(\frac{0.0577}{1+10^{7.688-\text{pH}}}+\frac{2.487}{1+10^{\text{pH}-7.688}}\right)\times \text{MIN}\left(2.85, 1.45\times 10^{0.028\times(25-\text{T})}\right)$
Results:	1.77	0.72

1. No seasonal variation was assumed for pH, therefore, there is no seasonal variation in the acute criterion (which is a function of pH only).

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

Floating, Suspended and Submerged Matter

The State of Idaho has a narrative water quality criterion which reads "Surface waters of the state shall be free from floating, suspended, or submerged matter of any kind in concentrations causing nuisance or objectionable conditions or that may impair designated beneficial uses (IDAPA 58.01.02.200.05)." This criterion has been included in the permit as a narrative effluent 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-5 Summary of Effluent Limit Bases	
Limited Parameter	**Basis for Limit**
BOD_5	Clean Water Act (CWA) Section 301(b)(1)(B), 40 CFR 133 (technology-based)
TSS	CWA Section 301(b)(1)(B), 40 CFR 133 (technology-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	CWA Sections 301(b)(1)(C) and 402(o), 40 CFR 122.44(d), IDAPA 58.01.02.250.01.a. (water quality-based and anti-backsliding)
E. Coli	CWA Sections 301(b)(1)(C) and 402(o), 40 CFR 122.44(d), IDAPA 58.01.02.251.01 (water quality-based and anti-backsliding)
Chlorine	CWA Section 301(b)(1)(C), 40 CFR 122.44(d), IDAPA 58.01.02.060, IDAPA 58.01.02.210 (water quality-based, with mixing zone)
Ammonia	CWA Section 402(o), IDAPA 48.01.02.051.02 (anti-backsliding, antidegradation)
Phosphorus	CWA Section 301(b)(1)(C), 40 CFR 122.44(d), IDAPA 58.01.02.060, IDAPA 50.01.02.200.06 (water quality-based, with mixing zone)

Appendix D: Reasonable Potential Calculations

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

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

A. Mass Balance

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

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

where,

C_d = Receiving water concentration downstream of the effluent discharge (that is, the concentration at the edge of the mixing zone)
C_e = Maximum projected effluent concentration
C_u = 95th percentile measured receiving water upstream concentration
Q_d = Receiving water flow rate downstream of the effluent discharge = $Q_e + Q_u$
Q_e = Effluent flow rate (set equal to the design flow of the WWTP)
Q_u = Receiving water low flow rate upstream of the discharge (1Q10, 7Q10 or 30B3)

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

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

The above form of the equation is based on the assumption that the discharge is rapidly and completely mixed with the receiving stream, and 100% of the stream flow is available for mixing, under the State's mixing zone policies. If the mixing zone is based on less than complete mixing with the receiving water, the equation becomes:

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

Where MZ is the fraction of the receiving water flow available for dilution. The Idaho water quality standards generally limit mixing zones to 25% of the volume of the stream flow, and, in Section 5.1.1, EPA's *Water Quality Standards Handbook* states that a mixing zone "must be limited to an area or volume as small as practicable." In order to ensure that the mixing zones in

the Idaho Falls permit are as small as practicable, EPA has used 10% of the flow for mixing, except for phosphorus (see Appendix F). Effluent data show that the facility can comply with the effluent limits that result from the use of a 10% mixing zone.

Mixing zones are not allowed for zinc and toluene, because the maximum projected effluent concentrations of these parameters are less than the applicable water quality criteria. If a mixing zone is not allowed, dilution is not considered when projecting the receiving water concentration and,

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

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

$$D = \frac{Q_e + 0.1 \times Q_u}{Q_e} \qquad \text{(Equation D-5)}$$

There are five values for the dilution factor: One based on the 1Q10 flow rate in the receiving stream and used to determine reasonable potential and wasteload allocations for acute aquatic life criteria, one based on the 7Q10 flow rate to determine reasonable potential and wasteload allocations chronic aquatic life criteria (except for ammonia) and conventional pollutants, one based on the 30B3 flow rate to determine reasonable potential and wasteload allocations for the chronic ammonia criterion, one based on the 30Q5 flow rate and used to determine reasonable potential and wasteload allocations for human health criteria for non-carcinogens, and one based on the harmonic mean flow rate and used to determine reasonable potential and wasteload allocations for human health criteria for carcinogens. All dilution factors are calculated with the effluent flow rate set equal to the design flow of 26.3 CFS (17 mgd). The dilution factors are listed in Table D-1, below. In addition, there is a specific dilution factor for phosphorus (see Appendix F).

Table D-1: Dilution Factors

Acute Dilution Factor	Chronic Dilution Factor	Chronic Ammonia Criterion Dilution Factor	Human Health Non-Carcinogen Dilution Factor	Human Health Carcinogen Dilution Factor
5.45	6.32	8.00	8.22	16.0

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

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

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

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

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

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

B. Maximum Projected Effluent Concentration

For ammonia and chlorine, EPA has used maximum daily limits in the 2001 permit as the maximum projected effluent concentrations. The previous permit's effluent limits are used in this manner because, in general, the anti-backsliding provisions of the Clean Water Act (Section 402(o)) require that water quality-based effluent limits in reissued permits be at least as stringent as the effluent limits in the previous permit. If a discharge at the maximum limits in the previous permit would not result in excursions above water quality standards, then the previous permit's effluent limits may be retained.

For TSS, EPA has used the technology-based average weekly limit as the maximum projected effluent concentration. Water quality-based effluent limits are necessary only in cases where the technology-based effluent limit does not ensure compliance with water quality standards.

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

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

The CV is defined as the ratio of the standard deviation of the data set to the mean, but when fewer than 10 data points are available, the TSD recommends making the assumption that the CV is equal to 0.6 (see TSD at Page 53). For all pollutants except whole effluent toxicity (WET), when there were less than 10 data points available, EPA made the assumption that the CV was equal to 0.6.

For WET, there were eight data points available, and all eight data points were equal to 2.0 TUc. Eight identical data points suggest very little effluent variability. The TSD states, on Page E-3, that "typical values for the CV for effluent data usually range from 0.2 to 1.2." Because the effluent toxicity appears to have low variability, EPA has assumed a CV of 0.2 for WET, instead of 0.6.

Using the equations in section 3.3.2 of the TSD, the reasonable potential multiplier (RPM) is calculated based on the CV and the number of samples in the data set as follows. The following discussion presents the equations used to calculate the RPM, and also works through the calculations for the RPM for copper as an example. Reasonable potential calculations for all pollutants can be found in Table D-2.

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

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

where,

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

The data set contains 41 copper samples collected from the effluent, therefore:

$p_n = (1 - 0.99)^{1/41}$
$p_n = 0.894$

This means that we can say, with 99% confidence, that the maximum reported effluent copper concentration is greater than the 89th percentile.

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

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

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

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

In the case of copper:

CV = coefficient of variation = 0.606
$\sigma^2 = \ln(CV^2 + 1) = 0.312$
$\sigma = \sqrt{\sigma^2} = 0.559$
z = 2.326 for the 99th percentile = 1.247 for the 89th percentile

$C_{99} = \exp(2.326 \times 0.559 - 0.5 \times 0.312) = 3.140$
$C_{89} = \exp(1.247 \times 0.559 - 0.5 \times 0.312) = 1.717$

$RPM = C_{99}/C_{89} = 3.140/1.717$
RPM = 1.83

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

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

where MRC = Maximum Reported Concentration

In the case of copper,

C_e = (1.83)(32.0 µg/L) = **58.5 µg/L**

C. Maximum Projected Receiving Water Concentration

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

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

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

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

Where C_e is expressed total recoverable metal, C_u and C_d are expressed as dissolved metal, and CF is the conversion factor. EPA was not able to locate any upstream ambient water quality data for copper. For the purposes of this analysis, EPA has assumed that the upstream ambient copper concentration is zero.

For copper the acute receiving water concentration is, in micrograms per liter:

$$C_d = \left[\frac{0.960 \times 58.5 - 0}{5.45}\right] + 0 = 10.3$$

For copper the chronic receiving water concentration is, in micrograms per liter:

$$C_d = \left[\frac{0.960 \times 58.5 - 0}{6.32}\right] + 0 = 8.88$$

The acute and chronic water quality criteria are 19.1 and 12.6 µg/L, respectively. Because the projected receiving water concentrations are less than the criteria, a water quality-based effluent limit is not necessary for copper.

Table D-2, below, summarizes the reasonable potential calculations for chromium, copper, lead, silver, zinc, chlorine, nitrate, total nitrogen, ammonia, whole effluent toxicity, chloroform, dichlorobromomethane, and toluene. Although the permittee performed the pollutant scans required by Part D of the Form 2A application, all results were non-detect, except for the pollutant parameters named above.

In addition to the effluent testing required by the Form 2A application, the permittee separately provided effluent data for arsenic, cadmium, mercury, nickel, and cyanide. All results for these pollutants were less than analytical detection or quantification limits, and, in every case except mercury, the detection or quantification limits were less than the water quality criteria. EPA believes the fact that arsenic, cadmium, nickel, and cyanide were never detected at levels equal to or greater than the water quality criteria means that the discharge does not have the reasonable potential to cause or contribute to excursions above water quality standards for those pollutants.

It is not clear from the available effluent data whether the discharge has the reasonable potential to cause or contribute to excursions above water quality standards for mercury, therefore, the permit requires effluent monitoring for mercury, with a lower required analytical minimum level.

D. Interpretation of Narrative Criteria

The State of Idaho has EPA-approved numeric water quality criteria for all of the parameters of concern, except for TSS, nitrate, whole effluent toxicity, and phosphorus. For these parameters, EPA has interpreted the State of Idaho's narrative criteria (IDAPA 58.01.02.200) as follows.

For TSS, EPA has interpreted Idaho's narrative criterion for sediment (IDAPA 58.01.02.200.08) using the in-stream target from the American Falls Subbasin Assessment and TMDL, which is 60 mg/L.

Among the receiving water's designated uses is domestic water supply. The State of Idaho does not have numeric criteria for nitrate. EPA's Clean Water Act Section 304(a) recommended criterion for nitrates, for the protection of human health for consumption of water and organisms, is 10 mg/L (see *Quality Criteria for Water 1986*). EPA has used this value to interpret Idaho's narrative criterion for toxic substances (IDAPA 58.01.02.200.02). Consistent with Section 210.03 of the Idaho WQS, EPA has used the 30Q5 stream flow rate and the associated dilution factor for the reasonable potential calculation for nitrate.

For chronic whole effluent toxicity, EPA has interpreted Idaho's narrative criterion for toxic substances (IDAPA 58.01.02.200.02) using the recommendations of the TSD (see Pages xiv and 35). Specifically, EPA has used a criterion continuous concentration (chronic water quality criterion) of 1.0 chronic toxic units.

Reasonable potential and effluent limit calculations for phosphorus, including EPA's interpretation of Idaho's narrative criterion for nutrients (IDAPA 58.01.02.200.06) are described in Appendix F.

Table D-2: Reasonable Potential Calculations - City of Idaho Falls

Dilution Factors	Acute	Chronic	Chronic Ammonia	HH Non-Carcinogen	HH Carcinogen
	5.45	6.32	8.00	8.22	16.0

Probability Basis	Z-score of Probability Basis
0.99	2.33

All concentrations in µg/L unless otherwise noted

	Ammonia (mg/L)	Chlorine	TSS (mg/L)	Nitrate (mg/L)	Zinc	Chromium	Copper	Lead	Silver	Chloroform	Dichloro bromo methane	Toluene	WET, chronic (TUc)
Data Source	MDL (Prev. Permit)	MDL (Prev. Permit)	AWL (TBEL)	Effluent									
Max. Eff. Conc. (metals as TR)	N/A	N/A	N/A	11.1	79	6	32	2	2.9	4	0.76	0.57	2
# of samples (n)				118	42	42	41	42	42	2	2	2	8
CV				1.489	0.308	1.090	0.606	0.821	1.150	0.6	0.6	0.6	0.2
σ^2				1.169	0.091	0.783	0.312	0.515	0.843	0.307	0.307	0.307	0.039
σ				1.081	0.301	0.885	0.559	0.718	0.918	0.555	0.555	0.555	0.198
Percentile of Largest Value				0.962	0.896	0.896	0.894	0.896	0.896	0.100	0.100	0.100	0.562
Z-Score of Percentile of Largest Value				1.771	1.260	1.260	1.247	1.260	1.260	-1.282	-1.282	-1.282	0.157
C_{99}				6.894	1.925	5.297	3.140	4.105	5.552	3.115	3.115	3.115	1.554
C_n				3.782	1.397	2.061	1.717	1.909	2.086	0.421	0.421	0.421	1.012
RPM				1.82	1.38	2.57	1.83	2.15	2.66	7.39	7.39	7.39	1.54
Max. Proj. Effluent Conc.	**5.7**	**200**	**45**	**20.2**	**109**	**15.4**	**58.5**	**4.30**	**7.72**	**29.6**	**5.6**	**4.2**	**3.07**
Ambient Conc.	0.00	0	16	0.257	0	0	0	0	0	0	0	0	0
Acute CF	1	1	1	1	0.978	0.982	0.96	0.773	0.85	1	1	1	1
Chronic CF	1	1	1	1	0.986	0.962	0.96	0.773	N/A	1	1	1	1
Max. Acute RWC	1.05	37	N/A	N/A	107	2.8	10.3	0.61	1.2	N/A	N/A	N/A	N/A
Max. Chronic/Single Value RWC	0.71	32	21	2.7	107	2.3	8.88	0.53	N/A	1.9	0.35	4.2	0.49
CMC	1.77	19	N/A	N/A	130	16	19.1	73.8	4.26	N/A	N/A	N/A	N/A
CCC	0.72	11	N/A	N/A	131	11	12.6	2.9	N/A	N/A	N/A	N/A	1
Most Stringent Single-Value Criterion	N/A	N/A	60	10	N/A	N/A	N/A	N/A	N/A	5.7	0.55	1300	N/A
Reasonable Potential?	**NO**	**YES**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

Appendix E: WQBEL Calculations - Aquatic Life Criteria

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

A. Calculate the Wasteload Allocations (WLAs)

Wasteload allocations (WLAs) are calculated using the same mass balance equations used to calculate the concentration of the pollutant at the edge of the mixing zone in the reasonable potential analysis (Equations D-6 and D-7). To calculate the wasteload allocations, C_d is set equal to the acute or chronic criterion and the equation is solved for C_e. The calculated C_e is the acute or chronic WLA. Equation D-6 is rearranged to solve for the WLA, becoming:

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

In the case of chlorine, for the acute criterion,

$$WLA_a = 5.45 \times (19 - 0) + 0$$
$$\mathbf{WLA_a = 104\ \mu g/l}$$

For the chronic criterion,

$$WLA_c = 6.32 \times (11 - 0) + 0$$
$$\mathbf{WLA_c = 69.5\ \mu g/l}$$

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

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

where,

$$\sigma^2 = \ln(CV^2 + 1)$$
$$\sigma = \sqrt{\sigma^2}$$
$$\sigma_4^2 = \ln(CV^2/4 + 1)$$
$$\sigma = \sqrt{\sigma_4^2}$$

z = 2.326 for 99th percentile probability basis

In the case of chlorine,

$$\sigma^2 = \ln(0.311^2 + 1) = 0.092$$
$$\sigma = \sqrt{\sigma^2} = 0.304$$
$$\sigma_4^2 = \ln(0.311^2/4 + 1) = 0.024$$

$\sigma = \sqrt{\sigma_4^2} = 0.155$

z = 2.326 for 99th percentile probability basis

Therefore,

LTA_a = 104 µg/L × exp(0.5 × 0.092 - 2.326 × 0.304)
LTA_a = 53.4 µg/L

LTA_c = 69.5 µg/L × exp(0.5 × 0.024 - 2.326 × 0.155)
LTA_c = 49.1 µg/L

The LTAs are compared and the more stringent is used to develop the daily maximum and monthly average permit limits as shown below. For chlorine, the chronic LTA of 49.1 µg/L is more stringent.

B. Derive the maximum daily and average monthly effluent limits

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

$MDL = LTA \times \exp(z_m \sigma - 0.5 \sigma^2)$ (Equation E-4)
$AML = LTA \times \exp(z_a \sigma_n - 0.5 \sigma_n^2)$ (Equation E-5)

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

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

In the case of chlorine,

MDL = 49.1 µg/L × exp(2.326 × 0.304 - 0.5 × 0.092)
MDL = 95 µg/L

AML = 49.1 µg/L × exp(1.645 × 0.057 - 0.5 ×0.003)
AML = 54 µg/L

Table E-1, below, details the calculations for water quality-based effluent limits based on two-value aquatic life criteria.

Limits Based on 2-Value Aquatic Life Criteria						
Statistical variables for permit limit calculation						
PARAMETER	AML Prob'y Basis	MDL Prob'y Basis	LTA Prob'y Basis	Acute Dil'n Factor	Chronic Dil'n Factor	Chronic Ammonia Dil'n Factor
All	0.95	0.99	0.99	5.45	6.32	8.00

Waste Load Allocation (WLA) and Long Term Average (LTA) Calculations							
	WLA Acute	WLA Chronic	LTA Acute	LTA Chronic	LTA Coeff. Var. (CV)	Limiting LTA	# of Samples per Month
PARAMETER	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*dimension-less*	*ug/L*	*n*
Chlorine	104	69.5	53.4	49.10	0.311	49.1	30

Effluent Limit Calculation Summary									
	Metal Criteria Translator		Ambient Conc.	Water Quality Criterion Acute	Water Quality Criterion Chronic	**Average Monthly Limit (AML)**	**Max. Daily Limit (MDL)**	**Average Monthly Limit (AML)**	**Max. Daily Limit (MDL)**
PARAMETER	Acute	Chronic	*ug/L*	*ug/L*	*ug/L*	***ug/L***	***ug/L***	*lb/day*	*lb/day*
Chlorine	1.000	1.000	0.00	19	11	**54**	**95**	**7.6**	**13.5**

Appendix F: Total Phosphorus Reasonable Potential and Limits

EPA has determined that the discharge of total phosphorus from the City of Idaho Falls wastewater treatment plant has the reasonable potential to cause or contribute to violations of Idaho's water quality criteria for nutrients. Therefore, effluent limits for phosphorus are required. The basis for the phosphorus limits in the draft permit is described in detail below.

A. Interpretation of the Narrative Criterion for Nutrients

Permitting authorities may establish effluent limits based on narrative criteria, as provided for in 40 CFR 122.44(d)(1)(vi). This regulation allows permitting authorities to "(e)stablish effluent limits using a calculated numeric water quality criterion for the pollutant which the permitting authority demonstrates will attain and maintain applicable narrative water quality criteria and will fully protect the designated use" (40 CFR 122.44(d)(1)(vi)(A)), or to "(e)stablish effluent limits on a case-by-case basis, using EPA's water quality criteria, published under section 304(a) of the CWA, supplemented where necessary by other relevant information." Where appropriate, permitting authorities may also establish effluent limits for an indicator parameter (40 CFR 122.44(d)(1)(vi)(C)). It is not necessary in this case to establish effluent limits based on an indicator parameter, because phosphorus is known to contribute to violations of water quality standards in this watershed, and phosphorus may be directly measured and limited in an effluent.

In this case, EPA proposes to interpret Idaho's narrative criterion for nutrients using the 50 µg/L in-stream phosphorus target from the draft *American Falls Subbasin Total Maximum Daily Load Plan: Subbasin Assessment and Loading Analysis*, hereinafter referred to as the 2009 Draft American Falls TMDL (IDEQ 2009). In the 2009 Draft American Falls TMDL, the State of Idaho determined that this target is adequate to ensure compliance with water quality standards. This target is identical to the recommendation of *Quality Criteria for Water 1986* (EPA 440/5-86-001), which states that "(t)o prevent the development of biological nuisances and to control accelerated or cultural eutrophication, total phosphates as phosphorus (P) should not exceed 50 µg/L in any stream at the point where it enters any lake or reservoir…." Therefore, effluent limits for phosphorus may be established using this interpretation of Idaho's narrative criterion for nutrients, under 40 CFR 122.44(d)(1)(vi)(A) and (B).

Duration, Frequency and Basis for Year-Round Limits

A water quality criterion consists not only of the magnitude (numeric value) of the criterion; water quality criteria have an averaging period and an allowable excursion frequency as well. Neither *Quality Criteria for Water 1986* nor the *2009 Draft American Falls TMDL* suggest an averaging period or excursion frequency for the 50 µg/L target. However, according to the *Ambient Water Quality Criteria Recommendations: Information Supporting the Development of State and Tribal Nutrient Criteria: Rivers and Streams in Nutrient Ecoregion III* (EPA 822-B-00-016):

> "EPA does not recommend identifying nutrient concentrations that must be met at all times, rather a seasonal or annual averaging period…is considered appropriate. However, these seasonal or annual central tendency measures should apply each season or each year, except under the most extraordinary of conditions (Page 6)."

In Section 5.1.1, the 2009 Draft American Falls TMDL states that:

> "Lentic waters (e.g., lakes and reservoirs) act as sinks for nutrients, especially phosphorus, increasing the available time for uptake by aquatic vegetation. Thus, phosphorus or nitrogen that entered a stream in February could be bioavailable to aquatic vegetation in a reservoir in July when conditions are conducive to algal or macrophytic growth. Due to concern about American Falls Reservoir, which is on the 303(d) list for nutrients, no allowance for seasonal variation in nutrient loading is made."

Because downstream water quality concerns require year-round control of nutrients, EPA has evaluated the effects of phosphorus from the Idaho Falls discharge on a year-round basis. Therefore, consistent with the *Ambient Water Quality Criteria Recommendations*, EPA will consider the 50 µg/L target to be an annual average value in this case.

The *Ambient Water Quality Criteria Recommendations* state that annual average nutrient targets should be achieved "each year, except under the most extraordinary of conditions." A ten-year average excursion frequency or a 10% probability of an excursion in any given year is typical for water quality-based permitting (e.g. the use of 1-in-10 year low flows for toxics permitting) and is consistent with the criteria document's recommendation that nutrient targets be achieved each year, except under extraordinary conditions.

Therefore, the numeric interpretation of Idaho's narrative nutrient criterion, for phosphorus, in this case, is an annual average total phosphorus concentration of 50 µg/L (0.05 mg/L), which is not to be exceeded more than once every ten years.

B. Reasonable Potential

Federal regulations require that effluent limitations in NPDES permits "must control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which…are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality (40 CFR 122.44(d)(1)(i))."

The State of Idaho has a narrative criterion for nutrients, which reads "(s)urface 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)." In addition, excess nutrients can contribute to low dissolved oxygen concentrations. The City of Idaho Falls discharge is located upstream from the American Falls Reservoir, which is on the 303(d) list for dissolved oxygen and nutrients[1]. According to the 2009 Draft American Falls TMDL, phosphorus is considered the most likely limiting nutrient in the American Falls reservoir (see the 2009 Draft American Falls TMDL at Page xviii). The draft TMDL proposes load and wasteload allocations for sources of phosphorus to the American Falls reservoir in order to achieve water quality standards for nutrients and dissolved oxygen. Thus, discharges of

[1] The segment of the Snake River immediately downstream from the City of Idaho Falls is also on the 303(d) list for dissolved oxygen and nutrients, but IDEQ recommends de-listing this segment of the Snake River because monitoring data showed no violations of water quality criteria for dissolved oxygen, and concentrations of nutrients in the snake river were low relative to the target concentrations used to develop wasteload allocations in the draft *American Falls Subbasin Total Maximum Daily Load Plan: Subbasin Assessment and Loading Analysis* (IDEQ 2009). See the draft TMDL at Page xxxvi.

phosphorus upstream from the American Falls reservoir could contribute to violations of Idaho's water quality standards for nutrients and dissolved oxygen in the American Falls reservoir.

The City of Idaho Falls discharges a large phosphorus load to the Snake River. Effluent data collected between January 1999 and September 2009 (a total of 123 samples) show that the facility discharges an average of 239 lb/day (43.6 tons per year) total phosphorus. The City of Idaho Falls' average phosphorus load represents 25.5% of the 2009 Draft American Falls TMDL's 171 ton-per-year phosphorus load allocation for the Snake River near Shelly, Idaho (just downstream from the Idaho Falls discharge). Idaho Falls' average phosphorus load is 3.89 times the sum of the phosphorus wasteload allocations for the Cities of Blackfoot, Shelly and Firth in the 2009 Draft American Falls TMDL (11.2 tons/year). Once the TMDL is finalized and approved by EPA, NPDES permits for Blackfoot, Shelly and Firth must include effluent limits for phosphorus that are consistent with the wasteload allocations in the final TMDL (40 CFR 122.44(d)(1)(vii)(B)).

Furthermore, a discharge of phosphorus at the average effluent concentration of 2.68 mg/L, at the facility's design flow of 17 mgd (equivalent to 380 lb/day) would result in a phosphorus concentration of 97 µg/L at the edge of a mixing zone encompassing 25% of the flow of the Snake River, 64 µg/L at the edge of a mixing zone encompassing 50% of the flow, and 53 µg/L at the edge of a mixing zone encompassing 75% of the flow. These concentrations are greater than the in-stream phosphorus target of 50 µg/L.

Because the City of Idaho Falls' phosphorus load represents a significant fraction of the load allocation for the Snake River in the March 2009 Draft American Falls TMDL and because the discharge can increase the downstream concentration of phosphorus to more than 50 µg/L at the edge of a mixing zone encompassing up to 75% of the river flow, the discharge has the reasonable potential to cause or contribute to excursions above water quality standards for nutrients. Therefore, EPA must establish effluent limits for total phosphorus in the permit (40 CFR 122.44(d)(1)(i – iii)).

C. Basis for Proposed Effluent Limits

The proposed effluent limits are an average monthly limit of 388 lb/day and an average weekly limit of 582 lb/day. These effluent limits represent the facility's current performance, in terms of its phosphorus load, and ensure compliance with Idaho's narrative criteria for nutrients at the edge of a mixing zone, as explained below.

Draft American Falls TMDL

The load allocations for the Snake River and wasteload allocations for point sources discharging to the Snake River in the 2009 Draft American Falls TMDL are intended to maintain current water quality in the Snake River. Modeling has shown that, if phosphorus loading from the Snake River is allowed to increase from current levels, water quality standards may not be attained in American Falls Reservoir, even if all of the other load allocations in the TMDL are met (see the draft TMDL at Section 5.2.4.1). Thus, the load allocations for the Snake River represent no increase above current loads (see the draft TMDL at Section 5.2.4.2).

The City of Idaho Falls is located just upstream of the segment of the Snake River for which load and wasteload allocations are proposed in the 2009 Draft American Falls TMDL. Thus, the draft American Falls TMDL does not propose wasteload allocations for the City of Idaho Falls.

However, as discussed above, the loading of phosphorus discharged by the City of Idaho Falls represents a large fraction (25.5%) of the load allocation proposed for the Snake River near Shelley, Idaho, just downstream from the discharge. If the City of Idaho Falls were to increase its discharge of phosphorus above current levels, the phosphorus load allocation proposed for the Snake River near Shelley, Idaho may not be attained. Therefore, phosphorus effluent limits for the City of Idaho Falls must ensure that current phosphorus levels are maintained. In addition, the wasteload allocations for the Cities of Blackfoot, Shelley, and Firth are set at current loading levels (see the draft TMDL at Section 5.2.4.2). Thus, establishing phosphorus effluent limits for the City of Idaho Falls which ensure that phosphorus loads do not increase above current levels is consistent with the approach used to regulate other point sources of phosphorus to the Snake River upstream from American Falls reservoir.

Federal regulations require that, in general, effluent limits for POTWs that discharge continuously be expressed as average monthly limits and average weekly limits (40 CFR 122.45(d)(2)). A facility's maximum expected monthly average discharge may be estimated as the 92nd percentile of historical effluent data, or equivalently, the effluent loading that the facility achieves eleven twelfths of the time. The facility's 92nd percentile phosphorus load is 388 lb/day. The average monthly limit is equal to this load.

Compliance with Interpreted Narrative Criterion at the Edge of a Mixing Zone

As explained below, the proposed phosphorus effluent limits not only ensure that the current loading of phosphorus is maintained, they also ensure compliance with the interpreted narrative criterion at the edge of a mixing zone.

Critical Low Flow Condition

The critical low river flow condition used in reasonable potential and effluent limit calculations should be consistent with the averaging period and excursion frequency associated with the numeric interpretation of Idaho's narrative nutrient criterion. Since, in this case, the averaging period is annual, and the excursion frequency is once every ten years, the critical low river flow condition is the 10th percentile 365-day rolling average flow rate. For the Snake River, at the point of discharge, this flow rate is 3,998 CFS. This is based on a period of record of October 1987 through January 2009. This flow rate is less than (more conservative than) the river flow rate used for the load analysis in the draft TMDL (Table 5-6).

Upstream Concentration

NPDES regulations require EPA to consider existing controls on point and non-point sources of pollution when performing a reasonable potential analysis (40 CFR 122.44(d)(1)(ii)). This is accomplished by considering the upstream concentration of the pollutant of concern in the reasonable potential analysis. Since the numeric interpretation of the narrative criterion is an annual average value, EPA has used the median upstream concentration, which is 30 µg/L (0.03 mg/L). The median was used instead of the mean or average because the median is a more robust statistic than the average (i.e., it is less sensitive to outlying or incorrect values).

Mixing Zone Size

In general, mixing zones in Idaho may not encompass more than 25% of the volume of the stream flow (IDAPA 58.01.02.060.01(e)(iv)). However, IDEQ may authorize mixing zones larger than 25%, where appropriate. The effluent limits, which represent the facility's current

performance, require a mixing zone encompassing 54% of the stream flow, or, equivalently, a dilution factor of 84.1:1. IDEQ has stated in its Clean Water Act Section 401 certification that a mixing zone encompassing 54% of the stream flow is appropriate, for phosphorus, in this case.

Wasteload Allocation

The wasteload allocation is the amount of phosphorus that the permittee may discharge, while ensuring a level of water quality that is derived from and complies with all applicable water quality standards (40 CFR 122.44(d)(1)(vii)(A)). This is calculated as follows:

$$C_e = WLA = D \times (C_d - C_u) + C_u$$

Where:
C_e = Effluent concentration
C_d = Downstream concentration (the numeric interpretation of the narrative criterion)
C_u = Upstream concentration
D = Dilution Factor

In this case:
WLA = 84.1 × (0.05 µg/L – 0.03 µg/L) + 0.03 µg/L
= 1.71 mg/L

Translating the Wasteload Allocation to Effluent Limits

As stated above, the numeric interpretation of the narrative criterion for phosphorus is an annual average value, as is the river flow rate used to calculate the dilution factor. The median upstream concentration is also a long-term central tendency of the data. However, effluent limits in NPDES permits for POTWs that discharge continuously must be expressed as average monthly and average weekly limits (40 CFR 122.45(d)(2)).

As stated in Section 5.3.1 of the *Technical Support Document for Water Quality-based Toxics Control* or TSD, when the averaging periods for effluent limits differ from those of the water quality criteria (and therefore the wasteload allocation, which is calculated from the water quality criteria), it is necessary to use statistics to develop permit limits that consider effluent variability while ensuring a low probability that the WLA will be exceeded.

Since the numeric interpretation of the criterion is an annual average value, EPA will consider the wasteload allocation calculated above to be a long term average. In Table 5-2, the TSD contains an equation for calculating an average monthly permit limit that is consistent with a long term average wasteload allocation, along with a table of results for the equation for various values of the coefficient of variation (CV) and various sampling frequencies. In this case, the coefficient of variation is equal to 0.74. EPA proposes a sampling frequency for phosphorus of three times per week, which is the same monitoring frequency proposed for BOD_5 and TSS. This will result in at least 12 phosphorus samples per month.

Probability Basis

The probability basis is probability that the permittee will comply with the average monthly effluent limit, if the permittee's long term average and coefficient of variation are consistent with the assumptions used in the calculation of the average monthly limit. In general, for toxics permitting, the TSD recommends the use of the 95th percentile (5% exceedance probability) for

the average monthly limit. This is a conservative approach, which is justified when establishing effluent limits for toxic pollutants, but this conservatism is not necessary when establishing effluent limits for nutrients, where the goal is to achieve a certain annual average loading or concentration. Therefore, EPA has used the 99th percentile (1% exceedance probability) to calculate the average monthly limit.

Average Monthly Limit

Using the equation shown in Table 5-2 of the TSD, the CV of 0.74, a 99% probability basis, and the required sampling frequency of 12 samples per month, the multiplier to convert the long term average wasteload allocation to an average monthly limit is 1.60. Thus, the average monthly limit, if expressed as a concentration, is:

$$AML = 1.71 \text{ mg/L} \times 1.60 = 2.74 \text{ mg/L}$$

NPDES regulations require that, in general, effluent limits be expressed in terms of mass (40 CFR 122.45(f)). EPA has converted this concentration-based limit into a mass limit using the design flow of the treatment plant, as follows

$$\text{Mass Limit} = 2.74 \text{ parts per million} \times 17 \text{ million gallons/day} \times 8.34 \text{ lb/gallon}$$

$$= \mathbf{388\ lb/day}$$

While NPDES permit limits may be expressed as both concentration and mass, concentration limits are not necessary in this case. This is because nutrients are "far field" pollutants that exert their impact upon water quality over long distances. Furthermore, the receiving water provides a dilution factor of 155:1 after complete mixing. The TSD recommends that concentration limits be established for effluents discharging into waters with less than 100-fold dilution. Here, there is more than 100-fold dilution, so the effluent concentration will be insignificant, as long as the permittee complies with the mass limits in the draft permit.

Average Weekly Limit

In general, effluent limits for POTWs must be stated as average monthly limits and average weekly limits (40 CFR 122.45(d)(2)). EPA has established an average weekly limit equal to 1.5 times the average monthly limit, consistent with the secondary treatment technology-based effluent limits for BOD_5 and TSS.

$$AWL = AML \times 1.5 = 388 \text{ lb/day} \times 1.5$$

$$= \mathbf{582\ lb/day}$$

D. References

EPA. 1986. *Quality Criteria for Water 1986*. EPA 440/5-86-001.

EPA. 2000. *Ambient Water Quality Criteria Recommendations: Information Supporting the Development of State and Tribal Nutrient Criteria: Rivers and Streams in Nutrient Ecoregion III*. EPA 822-B-00-016. December 2000.

IDEQ. 2009. *American Falls Subbasin Total Maximum Daily Load Plan: Subbasin Assessment and Loading Analysis*. Draft. March 2009.

Appendix G: Endangered Species Act

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

In an e-mail dated January 21, 2009, NOAA Fisheries stated that there are no threatened or endangered species under NOAA's jurisdiction in the Snake River drainage upstream of the Hells Canyon Dam, which is located at river mile 247.5. The City of Idaho Falls discharge is located between river miles 793 and 794, and is thus about 546 miles upstream from the nearest ESA-listed threatened or endangered species under NOAA's jurisdiction. Therefore, the reissuance of this permit will have no effect on any listed threatened or endangered species under NOAA's jurisdiction. This is consistent with the findings of the fact sheet for the previous reissuance of this permit.

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

- Canada lynx (*Lynx canadensis*) Listed Threatened
- Grizzly bear (*Ursus arctos horribilis*) Listed Threatened
- Ute ladies'-tresses (*Spiranthes diluvialis*) Listed Threatened
- Utah valvata snail (*Valvata utahensis*) Listed Endangered, to be delisted effective September 24, 2010 (75 FR 52272)

Discharges of pollutants to surface waters have the potential to directly affect aquatic species. The only aquatic species on the list is the Utah valvata snail. According to the *Snake River Aquatic Species Recovery Plan* (USFWS 1995a), both the current and historic distributions of the Utah valvata snail are downstream from the American Falls dam, which is located at river mile 714, about 80 miles downstream from the subject discharge. Because the draft permit includes water quality-based limits for all pollutants or pollutant parameters that are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to excursions above water quality standards (40 CFR 122.44(d)(1)(i - iii)), as well as technology-based effluent limits which have been shown to be protective of water quality, and these limits ensure a level of water quality that is derived from and complies with water quality standards (40 CFR 122.44(d)(1)(vii)(A)), the discharge will not affect water quality downstream of the American Falls dam. Therefore, the reissuance of the City of Idaho Falls NPDES permit will have no effect on the Utah valvata snail.

EPA has also determined that the reissuance of an NPDES permit to the City of Idaho Falls will have no effect on the Canada lynx, grizzly bear, or ute ladies' tresses. These are terrestrial species, which are generally not susceptible to the water quality impacts that may result from the reissuance of an NPDES permit.

The primary causes of the Canada lynx's decline are habitat destruction, overutilization for commercial, recreational, scientific, or educational purposes, and climate change (USFWS 2005). The primary causes of the grizzly bear's decline are livestock depredation control, habitat deterioration, commercial trapping, unregulated hunting, and protection of human life (USFWS 1993). The primary causes of the ute ladies' tresses decline include modification of riparian and

wetland habitats associated with livestock grazing, vegetation removal, excavation, construction, stream channelization, exotic species invasion, and actions that alter hydrology (USFWS 1995b).

Reissuance of an NPDES permit to the City of Idaho Falls will have no effect on livestock depredation control, commercial trapping, unregulated hunting, habitat destruction, utilization of species for commercial, recreational, scientific, or educational purposes, climate change, vegetation removal, excavation, construction, stream channelization, exotic species invasion, or hydrologic alteration. Therefore, the issuance of this permit will have no effect on the Canada lynx, grizzly bear or the ute ladies' tresses.

References

US Fish and Wildlife Service. 1993. Grizzly bear recovery plan. Missoula, MT. 181 pp.

US Fish and Wildlife Service. 1995. Snake River Aquatic Species Recovery Plan. Snake River Basin Office, Ecological Services, Boise, Idaho. 92 pp.

US Fish and Wildlife Service. 1995. Ute ladies' tresses (Spiranthes diluvialis) recovery plan. US Fish and Wildlife Service, Denver, Colorado. 46 pp.

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

Appendix H: Draft Clean Water Act Section 401 Certification

Idaho Department of Environmental Quality

DRAFT §401 Water Quality Certification

June 3, 2010

NPDES Permit Number: **ID-0021261** City of Idaho Falls

Pursuant to the provisions of Section 401(a)(1) of the Federal Water Pollution Control Act (Clean Water Act), as amended, 33 USC Section 1341 (a)(1), the Idaho Department of Environmental Quality (DEQ) has authority to review National Pollution Discharge Elimination System (NPDES) permits and issue a water quality certification decision.

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

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

FECAL COLIFORM BACTERIA

The deletion of fecal coliform effluent limits and the inclusion of *E. coli* effluent limits are consistent with IDAPA 58.01.02 and protective of the surface water quality, and therefore, DEQ certifies these changes to the permit.

MIXING ZONES

Pursuant to IDAPA 58.01.02.060, DEQ authorizes the use of the mixing zones set out in the permit for the following pollutants: ammonia, chlorine, nitrate, chromium, copper, lead, silver, chloroform, dichlorobromomethane, and whole effluent toxicity (WET). In addition, DEQ authorizes a 54% mixing zone for total phosphorus. DEQ believes that mixing zones for pollutants such as phosphorus should be analyzed differently than mixing zones for toxic pollutants and that a mixing zone for phosphorus using 100% of the volume of the stream flow may be appropriate for certain discharges. DEQ also believes, however, that mixing zones should be kept as small as practicable. The City of Idaho Falls can maintain its existing load of phosphorus and meet water quality targets with a 54% mixing zone, and therefore, a larger mixing zone is not needed. DEQ is

proposing to certify the phosphorus limits and the accompanying mixing zone because, in the unique circumstances presented by the Idaho Falls discharge, the limits will ensure compliance with Idaho Water Quality Standards as described in the American Falls TMDL, consistency with the treatment of Blackfoot, Shelly and Firth, and a mixing zone that is no larger than is needed.

ANTIDEGRADATION

The Idaho water quality standards (WQS) provide that existing uses and the water quality necessary to protect the existing uses shall be maintained and protected (IDAPA 58.01.02.051.01). In addition, where water quality exceeds levels necessary to support uses, that quality shall be maintained and protected unless the Department finds, after intergovernmental coordination and public participation, that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located (IDAPA 58.01.02.051.02).

The limits in the proposed new permit for the City are set at levels which ensure the state's numeric and narrative criteria will be met. The numeric and narrative criteria are set at levels which protect and maintain applicable designated and existing uses. Therefore, in accordance with IDAPA 58.01.02.051.01, the limits in the proposed new permit protect and maintain designated and existing uses in the Snake River.

Furthermore, the limits in the proposed new permit for the City are the same or more stringent than the limits in the existing permit. Phosphorus limits have been added to the permit for the first time. In order to reflect a change to the WQS, the permit changes the bacteria limits from fecal coliform to *E. coli* limits. The *E. coli* limits, however, are as or more protective of water quality than the old fecal coliform limits. The limits in the proposed new permit, therefore, ensure that the existing level of water quality in the Snake River is maintained, and the analysis necessary to lower water quality set forth in IDAPA 58.01.02.051.02 is not triggered.

OTHER CONDITIONS

The certification is conditioned upon the requirement that any material modification of this permit or the permitted activities including without limitation, any modifications of the permit to reflect new or modified TMDL waste load allocations or other new information, shall first be provided to DEQ for review to determine compliance with state Water Quality Standards and to provide additional certification pursuant to section 401.

RIGHT TO APPEAL FINAL CERTIFICATION

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

Questions regarding the actions taken in this certification should be directed to Troy Saffle, DEQ (Idaho Falls Regional Office) at (208) 528-2650.

DRAFT

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Erick Neher
Regional Administrator
DEQ Idaho Falls Regional Office

Appendix I: Antidegradation Review by the Idaho Department of Environmental Quality

ANTIDEGRADATION REVIEW

NPDES Permit # ID-0021261 City of Idaho Falls Wastewater Treatment Facility

Idaho Department of Environmental Quality
June 3, 2010

Antidegradation

The Idaho Water Quality Standards (WQS) contain an antidegradation policy providing three levels of protection to water bodies in Idaho. The first level of protection applies to all water bodies and assures that existing uses of a water body will be maintained. The second level of protection applies to those water bodies that are considered high quality and assures that no lowering of water quality will be allowed unless it is deemed to be necessary and appropriate for important economic or social development. The third level of protection applies to water bodies that have been designated outstanding resource waters and requires activities to not cause a lowering of water quality.

Idaho has not designated any outstanding resource water bodies. In addition, Idaho is currently negotiating rule language for antidegradation implementation. Until the antidegradation implementation rule is effective for Clean Water Act purposes, DEQ will take a pollutant-by-pollutant approach in evaluating whether a discharge complies with Idaho's antidegradation policy (IDAPA 58.01.02.051). In this approach, any water body that is impaired will not be considered high quality for the pollutant(s) causing the impairment. The water body will however be considered high quality for any pollutants not causing an impairment.

Pollutants of Concern
The City of Idaho Falls Wastewater Treatment Facility (Idaho Falls) discharges the following pollutants of concern: biological oxygen demand (BOD), total suspended solids (TSS), *E. coli*, pH, chlorine, ammonia, phosphorus, nitrate, zinc, chromium, copper, lead, silver, chloroform, dichlorobromomethane, toluene, and whole effluent toxicity. Effluent limitations have been developed for BOD, TSS, *E. coli*, pH, chlorine, ammonia, and phosphorus. Effluent limitations were not deemed necessary for nitrate, zinc, chromium, copper, lead, silver, chloroform, dichlorobromomethane, toluene, or WET. Monitoring will be conducted during the permit cycle for arsenic, cadmium, chromium VI, total chromium, copper, cyanide, lead, mercury, nickel, orthophosphate, silver, and zinc for further analysis during the next permit renewal.

Receiving Water Body Level of Protection
Idaho Falls discharges to the Snake River (assessment unit ID17040201SK001_04). This assessment unit is not listed as impaired for any pollutant. Therefore, the receiving water body is considered high quality for all of the pollutants of concern.

Protection and Maintenance of Existing Uses
This portion of the Snake River has the following designated beneficial uses: cold water aquatic life; salmonid spawning; primary contact recreation; aesthetics; wildlife habitats; and domestic, agricultural, and industrial water supply. There is no other information indicating the presence of existing beneficial uses other than those that are designated.

In order to protect and maintain designated and existing beneficial uses, a permitted discharge must comply with Idaho water quality standards (WQS), which contain narrative and numeric criteria. The numeric and narrative criteria are set at levels which ensure protection of existing and designated beneficial uses.

The existing permit for Idaho Falls contains effluent limitations for fecal coliform as well as *E. coli*. The *E. coli* limits were in the permit to reflect the bacteria criterion that DEQ adopted to protect the contact recreation beneficial use (IDAPA 58.01.02.251.01). The fecal coliform limit was in the current permit because at the time the permit was issued, IDAPA 58.01.02.420.05 established a disinfection requirement for sewage wastewater treatment plant effluent. This requirement specified fecal coliform concentrations not exceed a geometric mean of 200/100 mL fecal coliform based on a minimum of five samples in one week. This section of Idaho WQS was revised in 2002 to reflect an earlier change in the bacteria criterion from fecal coliform to *E. coli*. As such, the proposed reissuance permit for Idaho Falls removes the fecal coliform limits. The *E. coli* limits are as or more protective of water quality than the old fecal coliform limits. In 1986, EPA updated its criteria to protect recreational use of water recommending an *E. coli* criterion as a better indicator of bacteria levels that may cause gastro-intestinal distress in swimmers than fecal coliform. DEQ changed its bacteria criterion from fecal coliform to *E. coli*, which as indicated earlier, is reflected in the current permit for Idaho Falls. The proposed permit contains *E. coli* effluent limitations that comply with numeric criteria at the "end-of-pipe;" therefore, this discharge is protective of designated and existing beneficial uses.

The effluent limitations and associated conditions contained in the Idaho Falls permit are set at levels that ensure compliance with the narrative and numeric criteria as well as Section 054 of Idaho WQS. Therefore, DEQ has determined the permit will protect and maintain existing and designated beneficial uses in the Snake River.

High Quality Waters

As indicated previously, Idaho Falls discharges to a segment (assessment unit) of the Snake River that is considered high quality for all of the pollutants of concern. As such, the quality of the Snake River must be maintained and protected, unless it is deemed appropriate and necessary to allow a lowering of water quality. Table 1 provides a summary of the existing permit limits and the proposed reissued permit limits.

Table 1. Comparison of proposed permit limits with current permit limits for those parameters which this Snake River assessment unit is considered high quality.

		Proposed Permit			**Current Permit**		
Parameter	Units	Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit	Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit
Five-Day BOD	mg/L	30	45	-	30	45	-
	lb/day	4250	6380	-	4250	6380	-
	% removal	85%	-	-	85%	-	-
TSS	mg/L	30	45	-	30	45	-
	lb/day			-	4250	6380	-
	% removal	85%	-	-	85%	-	-
pH	s.u.	6.5 – 9.0 all times			6.5 – 9.0 all times		
Fecal coliform	#/100 mL	-	-	-		200	
E. coli	#/100 mL	126		406	126		406
Total Residual Chlorine	µg/L	59	-	104	90	-	200
	lb/day	8.3	-	15	-	-	-
Total Ammonia (Jun – Sep)	mg/L	1.1	-	3.3	1.1	-	3.3
	lb/day	160	-	470	160	-	470
Total Ammonia (Oct – May)	mg/L	1.8	5.7	-	1.8	-	5.7
	lb/day	260	810	-	260	-	810
Total Phosphorus	mg/L	-	-	-	-	-	-
	lb/day	388	582	-	-	-	-

The proposed permit limits in Table 1 are the same as, or more stringent than those in the current permit. The effluent limit for total phosphorus in the proposed permit is a new limit which is not included in the current permit. This new limit maintains the current load of phosphorus in the discharge, and therefore, does not result in a lowering of water quality. With respect to those pollutants in the discharge for which there are no limits in the proposed permit, and no limits in the current permit, there is no reason to believe that these pollutants will be discharged in quantities greater than that which is allowed to be discharged under the current permit. Similarly, there is no reason to believe the effluent contains new pollutants that haven't been discharged previously. These conclusions are based upon the fact that there has been no change in the design flow, influent quality or treatment processes that would likely result in new or increased discharge of pollutants. Because the proposed permit does not allow for a new or increased water quality impact, DEQ has concluded that the proposed permit will not cause a lowering of water quality. As such, the proposed permit will maintain the existing water quality in the Snake River.