Fact Sheet

NPDES Permit Number: ID-002075-3
Date:
Public Notice Expiration Date:
Technical Contact: Lisa Jacobsen 206/553-6917 or
1-800-424-4372 (within Region 10)
jacobsen.lisa@epa.gov

The U.S. Environmental Protection Agency (EPA) Proposes to Reissue a Wastewater Discharge Permit to:

City of American Falls Wastewater Treatment Facility
Valdez Street
American Falls, Idaho 83211

and
the State of Idaho proposes to Certify the Permit

EPA Proposes NPDES Permit Reissuance

EPA proposes to reissue a National Pollutant Discharge Elimination System (NPDES) permit to the City of American Falls Wastewater Treatment Facility. The draft permit sets conditions on the discharge of pollutants from the City's waste water treatment plant to the Snake River.

This fact sheet includes:

- information on public comment, public hearing, and appeal procedures
- a description of the current and proposed discharge and biosolids practices
- a listing of past and proposed effluent limitations and other conditions
- a map and description of the discharge location
- detailed background information supporting the conditions in the draft permit

Idaho State Certification

The Idaho Department of Environmental Quality proposes to certify the NPDES permit for The City of American Falls Wastewater Treatment Facility, under section 401 of the Clean Water Act. The State provided preliminary comments on the draft permit and these comments have been incorporated into the draft permit.

Public Comment

Persons wishing to comment on or request a public hearing for the draft permit may do so in writing by the expiration date of the public notice. A request for a public hearing must state the nature of the issues to be raised, as they relate to the permit, as well as the requester's name, address and telephone number. All comments and requests for public hearings must be in writing and submitted to EPA as described in the Public Comments section of the attached public notice. After the public notice expires, and all substantive comments have been considered, EPA's regional Director for the Office of Water will make a final decision regarding permit reissuance.

Persons wishing to comment on State certification should submit written comments by the public notice expiration date to State of Idaho, Department of Environmental Quality, Pocatello Regional Office, 224 South Arthur, Pocatello, Idaho 83240.

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 comments are received, EPA will address the comments and issue the permit. The permit will become effective 33days after the issuance date, unless an appeal is submitted to Environmental Appeals Board within 33days.

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 (See address below).

United States Environmental Protection Agency
Region 10
1200 Sixth Avenue, OW-130
Seattle, Washington 98101
(206) 553-6917 or
1-800-424-4372 (within Alaska, Idaho, Oregon and Washington)

The fact sheet and draft permit are also available at:

EPA Operations Office
1435 North Orchard Street
Boise, Idaho 83706

The draft permit and fact sheet can also be found by visiting the Region 10 website at www.epa.gov/r10earth/water.htm.

For technical questions regarding the permit or fact sheet, contact Lisa Jacobsen at the phone numbers or email address at the top of this fact sheet.

TABLE OF CONTENTS

LIST OF ACRONYMS

AML	Average Monthly Limit
BMP	Best Management Practices
BOD_5	Five-day Biochemical Oxygen Demand
CFR	Code of Federal Regulations
cfs	Cubic feet per second
CWA	Clean Water Act
DMR	Discharge Monitoring Report
CV	Coefficient of Variation
EPA	United States Environmental Protection Agency
IDEQ	Idaho Department of Environmental Quality
LTA	Long Term Average
MDL	Maximum Daily Limit or Method Detection Limit
mgd	Million gallons per day
mg/l	Milligrams per liter
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
O&M	Operation and Maintenance
POTW	Publicly Owned Treatment Works
RP	Reasonable Potential
TMDL	Total Maximum Daily Load
TSD	*Technical Support Document for Water Quality-based Toxics Control*, (EPA 1991)
TSS	Total Suspended Solids
USFWS	United State Fish and Wildlife Service
USGS	United States Geological Survey
WWTF	Wastewater Treatment Facility
WLA	Wasteload Allocation
%MZ	Percent Mixing Zone
µg/L	Micrograms per liter

BACKGROUND INFORMATION

I. APPLICANT

City of American Falls Wastewater Treatment Facility (WWTF)

NPDES Permit No.: ID-002075-3

Facility Location:
Valdez Street
American Falls, Idaho 83211

Mailing Address:
239 Idaho Street
American Falls Idaho 83211

II. FACILITY ACTIVITY

The City of American Falls owns and operates a municipal treatment facility that provides secondary treatment and disinfection of domestic and industrial wastes prior to discharge to the Snake River. The current average design flow of the facility is 0.9 million gallons per day (mgd). Based on data submitted by the permittee, the current annual average flow is 0.45 mgd. The biosolids generated during the treatment process are placed in drying beds on the property. The final product is disposed of by land application. Raw sewage from septage pumper trucks is received at the plant.

See Appendix A for a map of the location of the treatment plant and discharge. Appendix B contains a detailed discussion of the treatment processes and waste streams.

III. RECEIVING WATER

The American Falls WWTF discharges to the Snake River between the outlet of the America Falls Dam and Eagle Rock (latitude 42^{O} 46' 26", longitude 112^{O} 52' 17"). The outfall is located approximately one quarter mile down stream from the American Falls Dam on the east bank of the River, at river mile 713.

The State of Idaho water quality standards (1998) designate beneficial uses for waters of the State. Idaho Water Quality Standards and Wastewater Treatment Requirements [16 Idaho, Title 1. Chapter 2, Section 2150.08 American Falls Subbasin (x)] protects this reach (US 1) for the following existing uses: domestic water supply, cold water biota, primary contact recreation, and agricultural use.

This segment of the Snake River is listed on Idaho's 303(d) list (a list of impaired waters compiled under section 303(d) of the Clean Water Act) as not meeting standards for sediments.

IV. FACILITY BACKGROUND

On December 4, 1981, EPA issued the current permit for the City of American Falls WWTF. The permit was modified on February 7, 1984 and August 30, 1984, and it expired December 3, 1986. The City applied for reissuance in August 1986. The permit has been administratively extended and the permittee has been authorized to continue discharging under the conditions of the expired permit.

The permittee submits monthly discharge monitoring reports (DMRs) to EPA summarizing the results of effluent monitoring required by the permit. Based on the DMRs from the past five years, the permittee has reported five violations of the permit, where they did not achieve 85% removal of TSS four times and BOD_5 once.

V. EFFLUENT LIMITATIONS

EPA followed the Clean Water Act, State and federal regulations, and EPA's 1991 *Technical Support Document for Water Quality-Based Toxics Control (TSD)* to develop the proposed effluent limits. In general, the Clean Water Act requires that the effluent limits for a particular pollutant be the more stringent of either the technology-based or water quality-based limits.

Technology-based limits are set based on the level of treatment that is achievable using readily available technology. In the case of this facility, technology-based limits cover four parameters: five day biochemical oxygen demand (BOD_5), total suspended solids (TSS), pH, and fecal coliform bacteria.

The Agency evaluates the technology-based limits to determine whether they are adequate to ensure that water quality standards are met in the receiving water. If the limits are not adequate, EPA must develop additional water quality-based limits. These limits are designed to prevent exceedances of the Idaho water quality standards in the Snake River. The proposed permit includes water quality-based limits for E. coli and total residual chlorine.

Table 1 compares the limits in the 1981 permit with those in the draft permit. *Appendix C* provides the basis for the development of technology-based and water quality-based effluent limits.

Table 1: Outfall 001 Effluent Limits								
Parameter	**Average Monthly Limit**		**Average Weekly Limit**		**Maximum Daily Limit**		**Range Limit**	
	Draft	1981	Draft	1981	Draft	1981	Draft	1981
Flow, mgd	---	4.2	---	---	---	---	---	---
BOD_5 mg/l lb/day Percent Removal [1]	30 225 85	30 140 85	45 338	45 210	---	---	---	---
TSS mg/l lb/day Percent Removal [1]	30 225 85	30 140 85	45 338	45 210	---	---	---	---
E. coli [2] #/100 ml	126	---	---	---	406 [3]	---	---	---
Fecal coliform #/100 ml	---	50	200	100	---	---	---	---
Total Residual Chlorine µg/l lb/day	120 0.9	---	---	---	210 1.6	---	---	---
pH, std units	---	---	---	---	---	---	6.5-9.0 [4]	6.5-9.0 [4]

Footnotes:
1 The percent removal requirements represent a minimum.
2. The 1981 permit required fecal coliform limits only. The draft permit requires E. coli limits as well.
3 Note: This limit is an Instantaneous maximum daily limit and not an average.
4 The 1981 and draft permits require that the pH be within the specified range at all times.

The draft permit prohibits the discharge of waste streams that are not part of the normal operation of the facility, as reported in the permit application. The draft permit also requires that the discharge be free from floating, suspended, or submerged matter in concentrations that cause/may cause a nuisance.

VI. SLUDGE MANAGEMENT

The proposed NPDES wastewater permit does not contain requirements related to sewage sludge. EPA Region 10 has recently decided to change the regional approach to permitting the disposal of biosolids ("sewage sludge" or sludge") and to separate wastewater and sludge into separate permits. EPA will issue a sludge only permit to this facility at a later date. Sludge permit coverage may be in the form of a general permit in which EPA can cover and better serve multiple facilities with similar limitations and management requirements.

The Clean Water Act (CWA) prohibits the use or disposal of biosolids not in compliance with 40 CFR 503 and provides EPA with the authority to enforce these regulations directly (even in the absence of a permit). Removal of specific sewage sludge requirements from the proposed permit does not remove the responsibility of the facility to comply with the requirements of these regulations. The state of Idaho currently conducts a program to regulate the management of biosolids. If the applicant performs sludge activities in accordance with the federal and state regulations, the environment should be protected until such time as a sludge-only permit is prepared for this facility.

The proposed permit requires the permittee to submit a biosolids permit application for this facility.

VII. MONITORING REQUIREMENTS

A. Effluent Monitoring

Section 308 of the Clean Water Act and federal regulations (40 CFR 122.44(i)) require that monitoring be included in permits to determine compliance with effluent limitations. Monitoring may also be required to gather data for future effluent limitations or to monitor effluent impacts on receiving water quality. The City of American Falls is responsible for conducting the monitoring and for reporting results on Discharge Monitoring Reports (DMR) to EPA.

Table 2 compares the proposed monitoring requirements in the draft permit to those in the 1981 permit. Monitoring frequency is based on the minimum sampling necessary to adequately monitor the facility's performance as well as the monitoring requirements in the 1981 permit.

TABLE 2: Monitoring Requirements		
Parameter	**Draft Sample Frequency**	**1981 Sample Frequency**
$BOD_{5,}$ mg/l[1]	2/Week	2/Week
TSS, mg/l[1]	2/Week	2/Week
Total Ammonia as N, mg/l	2/Week	---
Nitrate/Nitrite as N, mg/l	2/Week	---
Total Kjeldahl as N, mg/l	2/Week	---
Total Phosphorus, mg/l	Quarterly	---
E. coli Bacteria, #/100 ml	5/week	---
Fecal coliform Bacteria, #/100 ml	2/Week	2/Week
Total Residual Chlorine, mg/l	5/week	5/week
Flow, mgd	Continuous	Continuous
Temperature, °C	1/Week	---
pH, standard units[2]	5/week	5/Week
Snake River Flow, cfs	5/week	---

Footnotes:
1 The draft permit and the 1981 permit require influent and effluent monitoring to determine compliance with effluent limitations and percent removal requirements.
2 The draft permit requires the permittee to report the number and duration of pH excursions during the month.

B. Representative Sampling

The draft permit specifically requires representative sampling whenever a bypass, spill, or non-routine discharge of pollutants occurs, if the discharge may reasonably be expected to cause or contribute to a violation of an effluent limit under the permit. This provision is included in the draft permit because routine monitoring could easily miss permit violations and/or water quality standards exceedances that could result from bypasses, spills, or non-routine discharges. This requirement directs the permittee to conduct additional, targeted monitoring to quantify the effects of these occurrences on the final effluent discharge.

VIII. OTHER PERMIT CONDITIONS

A. Quality Assurance Plan

Federal regulations at 40 CFR 122.41(e) require permittees to properly operate and maintain their facilities, including "adequate laboratory controls and appropriate quality assurance procedures." To implement this requirement, the draft permit requires that the City develop a Quality Assurance Plan to ensure that the monitoring data is accurate and to explain data anomalies if they occur. American Falls is required to implement the plan within 120 days of the effective date of the draft permit. The Quality Assurance Plan must include standard operating procedures the City must follow for collecting, handling, storing and shipping samples, laboratory analysis, and data reporting.

B. Operation & Maintenance Plan

Section 402 of the Clean Water Act and federal regulations 40 CFR 122.44(k)(2) and (3) authorize EPA to require best management practices, or BMPs, in NPDES permits. BMPs are measures for controlling the generation of pollutants and their release to waterways. For municipal facilities, these measures are typically included in the facility's Operation & Maintenance (O&M) plan. These measures are important tools for waste minimization and pollution prevention.

The draft permit requires the City of American Falls to incorporate appropriate BMPs into their O&M plan within 180 days of permit issuance. Specifically, the City must consider spill prevention and control, optimization of chlorine and other chemical use, public education aimed at controlling the introduction of household hazardous materials to the sewer system, and water conservation. To the extent that any of these issues have already been addressed, the City need only reference the appropriate document in its O&M plan. The O&M plan must be revised as new practices are developed.

As part of proper operation and maintenance, the draft permit requires the City to develop a facility plan when the annual average flow exceeds 85 percent of the design flow of the plant (0.9 mgd). The facility plan must

include a strategy for remaining in compliance with effluent limits in the permit.

C. Additional Permit Provisions

In addition to facility-specific requirements, sections III, IV, and V of the draft permit contain "boilerplate" requirements. Boilerplate is standard regulatory language that applies to all permittees and must be included in NPDES permits. Because the boilerplate requirements are based on regulations, they cannot be challenged in the context of an NPDES permit action. The boilerplate covers requirements such as monitoring, recording, reporting requirements, compliance responsibilities, and general requirements.

IX. OTHER LEGAL REQUIREMENTS

A. Endangered Species Act

The Endangered Species Act requires federal agencies to consult with the National Marine Fisheries Service and the U.S. Fish and Wildlife Service if their actions could beneficially or adversely affect any threatened or endangered species. EPA has determined that issuance of this permit will have **no effect** any of the threatened or endangered species in the vicinity of the discharge. See Appendix E for further details.

B. State Certification

Section 401 of the Clean Water Act requires EPA to seek certification from the State that the permit is adequate to meet State water quality standards before issuing a final permit. The regulations allow for the State to stipulate more stringent conditions in the permit, if the certification cites the Clean Water Act or State law references upon which that condition is based. In addition, the regulations require a certification to include statements of the extent to which each condition of the permit can be made less stringent without violating the requirements of State law.

Part of the State's certification is authorization of a mixing zone. The draft permit was developed using the assumption that 25 percent of the low flow would be authorized as a mixing zone. If the State authorizes a different mixing zone in its final certification, EPA will recalculate the effluent limitations based on the dilution available in the final mixing zone. If the

State does not certify the mixing zone, EPA will recalculate the permit limitations based on meeting water quality standards at the point of discharge (end-of-pipe).

C. Permit Expiration

This permit will expire five years from the effective date.

REFERENCES

EPA 1991. *Technical Support Document for Water Quality-based Toxics Control*. Office of Water Enforcement and Permits, Office of Water Regulations and Standards. Washington, D.C., March 1991. EPA/505/2-90-001.

IDEQ 1999. *The Lake Walcott Subbasin Assessment and Total maximum Daily Load.* Water Quality Protection Section, Water Quality and Remediation Division Idaho, December 20, 1999

APPENDIX A -CITY OF AMERICAN FALLS - FACILITY MAPS

APPENDIX B - CITY OF AMERICAN FALLS WASTE STREAMS AND TREATMENT PROCESSES

I. Discharge Composition

In its NPDES application, the City of American Falls reported the pollutants listed in Table B-1 as being detected in its discharge from outfall 001. The toxic and conventional pollutant categories are defined in the regulations (40 CFR 401.15 and 401.16, respectively). The category of nonconventional pollutants includes all pollutants not included in toxic or conventional categories.

Table B-1: Pollutants Detected in Discharge

Pollutant type	Parameter	Maximum Reported Concentration
Conventional	5-day biochemical oxygen demand (BOD_5), weekly average	24.1 mg/l
	Total Suspended Solids (TSS), weekly average	44 mg/l
	pH, min - max	6.7 - 8.3
	Fecal coliform Bacteria, weekly average	217/100ml
Non-Conventional	Chlorine, daily average	0.6 mg/l
	Temperature	21 C

.

II. Treatment Processes

Preliminary treatment:

- Flow measurement and recording
- Solids removal (bar screen)
- Dewatering and landapplication of removed solids
- Preaeration/grit removal (grit chamber)

Primary treatment:

- Primary Clarification

Secondary treatment:

- Submerged Biological Contactors
- Rotating Biological Contactor
- North Secondary Clarification
- Chlorination

- [1]*Trickling Filter
- *South Secondary Clarification
- *Chlorination

Final Discharge

- Design flow - 0.9 mgd
- Maximum effluent flow - 0.63 mgd
- Average effluent flow - 0.45 mgd

Biosolids (sludge) handling

- Sludge drying beds
- Land application

[1]* Equipment that is not in use at this time but will be in the event that the population grows and the design flow of 0.9 mgd becomes insufficient. The additional equipment will bring the potential design flow up to 1.5 mgd.

APPENDIX C - BASIS FOR EFFLUENT LIMITATIONS

I. Statutory and Regulatory Basis for Limits

Sections 101, 301(b), 304, 308, 401, 402, and 405 of the Clean Water Act provide the basis for the effluent limitations and other conditions in the draft permit. The EPA evaluates discharges with respect to these sections of the CWA and the relevant NPDES regulations to determine which conditions to include in the draft permit.

In general, the EPA first determines which technology-based limits must be incorporated into the permit. EPA then evaluates the effluent quality expected to result from these controls, to see if it could result in any exceedances of the water quality standards in the receiving water. If exceedances could occur, EPA must include water quality-based limits in the permit. The draft permit limits reflect whichever requirements (technology-based or water quality-based) are more stringent. The limits that EPA is proposing in the draft permit are found in Section V in the body of this fact sheet. This Appendix describes the technology-based and water quality-based evaluation for the City of American Falls.

II. Technology-based Evaluation

The 1972 Clean Water Act required publicly owned treatment works (POTWs) to meet performance-based requirements based on available wastewater treatment technology. Section 301 of the Act established a required performance level, referred to as “secondary treatment,” that all POTWs were required to meet by July 1, 1977.

More specifically, Section 301(b)(1)(B) of the Clean Water Act requires that EPA develop secondary treatment standards for POTWs as defined in Section 304(d)(1) of the CWA. Based on this statutory requirement, EPA developed secondary treatment regulations which are specified in 40 CFR Part 133.102. These technology-based regulations apply to all municipal wastewater treatment plants and identify the minimum level of effluent quality attainable by secondary treatment in terms of five-day biochemical oxygen demand (BOD_5), total suspended solids (TSS), and pH. In addition to the federal technology requirements, the State of Idaho has technology-based requirements for fecal coliform bacteria for municipal sewage treatment plants (See section IV of this appendix for a complete discussion of the limits based on these requirements).

III. Water Quality-based Evaluation

In addition to the technology-based limits discussed above, EPA evaluated the discharge to determine compliance with Section 301(b)(1)(C) of the Clean Water Act. This section requires the establishment of limitations in permits necessary to meet water quality standards by July 1, 1977.

The regulations at 40 CFR 122.44(d)(1) implement section 301(b)(1)(C) of the Clean Water Act. These regulations require that NPDES 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 water quality standard, including State narrative criteria for water quality." The limits must be stringent enough to ensure that water quality standards are met, and must be consistent with any available wasteload allocation (WLA).

In determining whether water quality-based limits are needed and developing those limits when necessary, EPA uses the approach outlined below:

1. Determine the appropriate water quality criteria
2. Determine whether there is "reasonable potential" to exceed the criteria
3. If there is "reasonable potential", develop a WLA
4. Develop effluent limitations based on WLA

The following sections provide a detailed discussion of each step. Appendix D provides example calculations to illustrate how these steps are implemented.

A. Determine Water Quality Criteria

The first step in developing water quality-based limits is to determine the applicable water quality criteria. For Idaho, the State water quality standards are found at IDAPA 16, Title 1, Chapter 2. The applicable criteria are determined based on the beneficial uses of the receiving water as identified in Section III of the Fact Sheet. For any given pollutant, different uses may have different criteria. To protect all beneficial uses, the permit limits are based on the most stringent of the water quality criteria applicable to those uses (see Table C-1 in Section B.5).

B. Reasonable Potential Evaluation

To determine if there is "reasonable potential" to cause or contribute to an exceedance of the water quality criteria for a given pollutant, the EPA

compares applicable water quality criteria to the maximum expected receiving water concentrations for a particular pollutant. If the expected receiving water concentration exceeds the criteria, there is "reasonable potential" and a water quality-based effluent limit must be included in the permit.

EPA used the recommendations in Chapter 3 of the *Technical Support Document for Water Quality-based Toxics Control* (TSD, EPA 1991) to conduct this "reasonable potential" analysis for the City of American Falls Wastewater Facility. An example reasonable potential (RP) analysis for chlorine is found in Appendix D.

The maximum expected receiving water concentration C_d is determined using the following mass balance equation.

$$C_d \times Q_d = (C_e \times Q_e) + (C_u \times Q_u) \quad \text{or}$$

$$C_d = \frac{(C_e \times Q_e) + (C_u \times Q_u)}{Q_d}$$

where,

C_d = receiving water concentration downstream of the effluent discharge
C_e = maximum projected effluent concentration
= maximum reported effluent value X reasonable potential multiplier
Q_e = maximum effluent flow
C_u = upstream concentration of pollutant
Q_d = flow within mixing zone (mz) downstream of the effluent discharge
= $Q_e + Q_u$
Q_u = upstream flow authorized for mz

Section 1 through 4 below discusses each of the factors used in the mass balance equation to calculate C_d. Section 5 discusses the actual "reasonable potential" calculation for American Falls' discharge.

1. Effluent Concentration

The maximum projected effluent concentration (C_e) in the mass balance equation is represented by the 99th percentile of the effluent data set, calculated using the statistical approach recommended in the TSD. The 99th

percentile effluent concentration is calculated by multiplying the maximum reported effluent concentration by a reasonable potential multiplier. The reasonable potential multiplier accounts for uncertainty in the data. The multiplier decreases as the number of data points increases and variability of the data decreases. Variability is measured by the coefficient of variation (CV) of the data. When there are not enough data to reliably determine a CV, the TSD recommends using 0.6 as a default value. A partial listing of reasonable potential multipliers can be found in Table 3-1 of the TSD.

EPA evaluated the City of American Falls 2000 permit application and discharge monitoring reports (DMRs) from January 1995 through December 1999 to determine the maximum reported effluent concentrations. See Table C-1 in section 5, below, for a summary of maximum reported effluent concentrations, reasonable potential multipliers, and maximum projected effluent concentrations.

2. Effluent Flow

The effluent flow used in the equation is the design flow of the facility. The design flow used in the 1981 permit was 0.9 million gallons per day (mgd). The population in American Falls has grown slightly since then and only the submerged biological contactors, rotating biological contactor, and the north secondary clarification are on line at this time.

3. Upstream (Ambient) Concentration

The ambient concentration in the mass balance equation is based on a reasonable worst-case estimate of the pollutant concentration upstream from the City of American Falls' discharge. For criteria that are expressed as maxima (for example, ammonia), the 95th percentile of the ambient data is generally used as an estimate of worst-case. For criteria that are expressed as minima (for example, dissolved oxygen) the 5th percentile of the ambient data is generally used as an estimate of worst-case. These percentiles were calculated based on data submitted by the City of American Falls. Where there were no data to determine the ambient concentration, zero was used in the mass balance equation. See Table C-1 in section 5, below, for a summary of ambient concentrations for specific pollutants.

4. Upstream Flow

Under Idaho's water quality standards, dischargers are generally not authorized to use the entire upstream flow for dilution of their effluent.

Instead, the standards contain the following considerations on mixing zones for determining compliance with chronic criteria:

> The size may be up to 25 percent of the stream width or 300 meters plus the horizontal length of the diffuser, whichever is less;
>
> The mixing zone may be no closer to the 7-day, 10-year low flow (7Q10)[2] than 15 percent of the stream width; and
>
> The mixing zone may not be more than 25 percent of the volume of the stream flow.

In addition to these restrictions, the standards specify that an acute mixing zone may be authorized inside the chronic mixing zone. The size of that mixing zone is limited to the "zone of initial dilution." Typically, EPA and the State have interpreted the acute mixing zone to be 25 percent of the 1-day, 10-year low flow (1Q10)[3].

The 1Q10 and 7Q10 flows are 58.0 cfs and 194.1 cfs, respectively. Based on the above standards, twenty five percent of these flows (14.5 and 48.5 cfs, respectively) were used in the mass balance equation to determine whether there was reasonable potential to cause exceedances of the acute and chronic criteria.

In accordance with state water quality standards, only the Idaho Department of Environmental Quality (IDEQ) may authorize mixing zones. If IDEQ authorizes a different size mixing zone in its final 401 certification, EPA will recalculate the reasonable potential and effluent limits based on the final mixing zone. If the State does not authorize a mixing zone in its 401 certification, EPA will recalculate the limits based on meeting water quality criteria at the point of discharge

---

[2]The 7-day, 10-year low flow is the 7-day average low flow that has a 10 percent chance of occurring in any given year. The 7Q10 was calculated based on the Log Pearson Type III distribution using United States Geological Survey (USGS) data (station # 13077000) from 1910 through 1999.

[3]The 1-day, 10-year low flow is the 1-day low flow that has a 10 percent chance of occurring in any given year. The 1Q10 was calculated based on the Log Pearson Type III distribution using United States Geological Survey (USGS) data (station # 13077000) from 1910 through 1999.

5. "Reasonable Potential" Calculation

Table C-2 summarizes the data, multipliers, and criteria used to determine "reasonable potential" to exceed criteria. The projected downstream concentration is compared to the most stringent criterion and when the downstream concentration is larger than the most stringent criterion that parameter must have a limit. Limits have been put into the permit for E. coli, Chlorine and pH. Section IV, below, provides a detailed discussion of the development of water quality-based effluent limitations for specific pollutants.

TABLE C-1: Reasonable Potential Calculations

Parameter	Maximum Reported Effluent Conc	CV	Reas Potential Multiplier	Maximum Projected Effluent Conc (C_e)	Upstrm Conc (C_u)	Projected Downstrm Conc (C_d)	Most Stringent Criterion
Chlorine, µg/l	600	0.3	1.1	660	0	110	11
pH, std units	6.7 - 8.3[1]	N/A[2]	N/A[2]	N/A[2]	6.7- 8.3	N/A[2]	6.5 - 9.0

Footnotes
1 These values are the minimum and maximum pH reported by the City of American Falls.
2 See the discussion on pH in Section IVF.

C. Wasteload Allocation and Long Term Average Concentration Development

Once EPA has determined that a water quality-based limit is required for a pollutant, the first step in determining a permit limit is development of a wasteload allocation (WLA) for the pollutant. A WLA 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. Waste Load Allocations can be calculated in different ways such as: based on a mixing zone; based on a WLA established as part of a TMDL; and based on meeting water quality criteria at "end-of-pipe". WLAs for this permit were calculated in two ways: based on a mixing zone for chlorine and based on meeting water quality criteria at "end-of-pipe" for pH and E. coli. A TMDL for phosphorus has not been done at American Falls, an informational TMDL for sediments has been completed.

The following paragraphs briefly summarize the three methods for developing WLA

1. Mixing zone-based WLA

   Where the state authorizes a mixing zone for the discharge, the WLA is calculated using a mass balance equation, based on the available dilution, background concentrations of the pollutant(s), and the water quality criteria. The mass balance equation is the same as that used to calculate reasonable potential, with the acute or chronic criterion (see page C-3) substituted for C_d and the WLA substituted for C_e.

   Because acute aquatic life and chronic aquatic life apply over different time frames and may have different mixing zones, it is not possible to compare them directly to determine which criterion results in the most stringent limits. The acute criteria are applied as a one-hour average and have a smaller mixing zone, while the chronic criteria are applied as a four-day average and have a larger mixing zone. To allow for comparison, the acute and chronic WLAs are statistically converted to a long-term average WLAs. The most stringent long-term average WLA is used to calculate the permit limits.

2. TMDL-based WLA

   Where the receiving water quality does not meet water quality standards, the WLA is generally based on a TMDL developed by the state or EPA. A TMDL is a determination of the amount of a pollutant, or property of a pollutant, from point, nonpoint, and natural background sources, including a margin of safety, that may be discharged to a water body without causing the water body to exceed the criterion for that pollutant. Any loading above this capacity risks violating water quality standards. Section 303(d) of the CWA requires states to develop TMDLs for waterbodies that will not meet water quality standards after the imposition of technology-based effluent limitations, to ensure that these waters will come into compliance with water quality standards.

   The first step in establishing a TMDL is to determine the assimilative capacity (the loading of a pollutant that a water body can assimilate without exceeding water quality standards). The next step is to divide the assimilative capacity into allocations for non-point sources (called load allocations), point sources (called WLAs), natural background loadings, and a margin of safety to account for any uncertainties. Permit limitations are then developed for point sources that are consistent with the WLAs. See section IV.E for details.

3. "End-of-Pipe" WLA

In some cases, there is no dilution available, either because the receiving water exceeds the criteria or because the state has decided not to authorize a mixing zone for a particular pollutant. When there is no dilution, the criterion becomes the WLA. Establishing the criterion as the WLA ensures that the permittee does not contribute to an exceedance of the criterion. As with the mixing-zone based WLA, the acute and chronic criteria must be converted to long-term averages and compared to determine which one is more stringent. The more stringent long term average concentration is then used to develop permit limits.

D Permit Limit Derivation

Once the WLA has been developed, EPA applies the statistical permit limit derivation approach described in Chapter 5 of the TSD to obtain daily maximum and monthly average permit limits. This approach takes into account effluent variability (through the CV), sampling frequency, and the difference in time frames between the monthly average and daily maximum limits.

The daily maximum limit is based on the CV of the data and the probability basis, while the monthly average limit is dependent on these two variables and the monitoring frequency. As recommended in the TSD, EPA used a probability basis of 95 percent for monthly average limit calculation and 99 percent for the daily maximum limit calculation. As with the reasonable potential calculation, when there were not enough data to calculate a CV, EPA assumed a CV of 0.6 for both monthly average and daily maximum calculations. Appendix D contains an example permit limit calculation.

The NPDES regulations at 40 CFR 122.45(d) require that permit limits for publicly owned treatment works (POTW) be expressed as average monthly limits (AMLs) and average weekly limits (AWLs) unless impracticable. Additionally, federal regulations do not prohibit a Permittee from increasing their sampling events above what is required in an NPDES permit. This is significant because a Permittee may collect as many samples as necessary during a week to bring the average of the data set below the average weekly effluent limit. In such cases, spikes of a pollutant could be masked by the increased sampling. While this is not a concern with pollutants that are not toxic, such as total suspended solids or phosphorus, it is a significant concern when toxic pollutants, such as chlorine or ammonia, are being discharged. Using a maximum daily limit will ensure that spikes do not

occur, and will be protective of aquatic life. In this case, an average weekly limit is not protective of water quality standards, therefore, it is not included in the permit. The final permit contains an average monthly limit and a maximum daily limit for chlorine.

E. Antidegradation

In addition to water quality-based limitations for pollutants that could cause or contribute to exceedances of numeric or narrative criteria, EPA must consider the State's Antidegradation policy. This policy is designed to protect existing water quality when the existing quality is better than that required to meet the standard and to prevent water quality from being degraded below the standard when existing quality just meets the standard. For high quality waters, Antidegradation requires that the State find that allowing lower water quality is necessary to accommodate important economic or social development before any degradation is authorized. This means that, if water quality is better than necessary to meet the water quality standards, increased permit limits can be authorized only if they do not cause degradation or if the State makes the determination that it is necessary. Most of the limits in the draft permit are as stringent as or more stringent than those in the 1981 permit, however, for BOD and TSS the loading limits increased due to population growth at the City of American Falls. The State will need to authorize this increase in an anti-degradation determination in the 401 certification.

IV. Pollutant-specific Analysis

This section outlines the basis for each of the effluent limitations in the City of American Falls' draft permit.

A. Biochemical Oxygen Demand and Total Suspended Solids

The American Falls Wastewater Facility is a publicly owned treatment works (POTW). As such, the facility is subject to the technology-based requirements for BOD_5 and TSS of 40 CFR 133.102, as outlined in Table C-2.

Table C-2: Secondary Treatment Requirements

Parameter	Average Monthly (mg/l)	Average Weekly (mg/l)	Percent Removal (%)
BOD_5	30	45	85
TSS	30	45	85

In addition to the concentration limits, 40 CFR 122.45(f) requires that NPDES permits contain mass-based limits for most pollutants. Mass-based limits in lbs/day are typically derived by multiplying the design flow in mgd by the concentration limit in mg/l by a conversion factor of 8.34.

B. Total Ammonia (as N)

Low concentrations of ammonia can be toxic to freshwater fish, particularly salmonids. Un-ionized ammonia (NH_3) is the principal toxic form of ammonia. The ammonium ion (NH_4^+) is much less toxic. The relative percentages of these two forms of ammonia in the water vary as the temperature and pH vary. As the pH and temperature increase, the percentage of ammonia that is in the un-ionized form increases, causing increased toxicity.

Because the toxicity of ammonia is dependent upon pH and temperature, the criteria are also pH and temperature dependent. EPA calculated the total ammonia criteria using pH and temperature values at the edge of the mixing zone. The 95th percentile temperature (20.6) and pH (8.6) were used to represent reasonable worst-case conditions. Based on this analysis, the acute and chronic criteria for the protection of cold water biota (IDAPA 16.01.02250.02.c.) are 1.57 mg/l and 0.26 mg/l, respectively.

As effluent mixes with receiving water, the temperature and pH change, making it difficult to predict how much of the total ammonia in the discharge will convert to the un-ionized form. However, EPA's calculations are based on too few samples that do not give true characteristics of the discharge. Hence, the calculations do not give an accurate comparison of the projected downstream concentration to the most stringent criterion of 0.26 mg/l. For the duration of this permit American Fall will be required to monitor for ammonia twice a week. Also, there will be ambient monitoring done on a quarterly basis upstream for ammonia, pH and temperature. This data will be used to determine if a limit is needed in future permits.

C. Fecal Coliform and E. coli Bacteria

In establishing fecal coliform limits for American Falls' draft permit, EPA considered Idaho's technology-based requirement for POTWs. And, in establishing E. coli limits for American Falls' draft permit EPA considered both the Idaho's water quality standard for primary recreation; and Idaho's water quality standard for secondary recreation. Since the primary recreation standards were more stringent than the secondary recreation standards only the primary recreation standards are in the permit. Table C-3 provides a summary of the requirements.

Table C-3: Idaho E. coli Standards

Basis	Period of Applicability	Average Monthly (#/100 ml)[1]	Average Weekly (#/100 ml)[1]	Maximum Daily (#/100 ml)
Technology standard for POTWs. Fecal coliform[1] (IDAPA 16.01.02420.05)	Year-round	---	200	---
Water Quality Criterion for Primary Recreation. E. coli[1] (IDAPA 16.01.02251.01.a)	Year-round	126	---	406

Footnotes:
1 For fecal coliform and E. coli bacteria, the average is defined as the geometric mean, based on a minimum of 5 samples.

The 1981 permit required meeting criteria for fecal coliform at the point of discharge. Therefore, EPA did not apply a mixing zone for the proposed permit. Because E. coli is a new standard, meeting criteria for E. coli was not a requirement in the 1981 permit and this is the first time that a limit has been included. Because there are no data at this time for E. coli, the coefficient value and reasonable potential multiplier are not applicable for establishing a limit in the draft permit.

D. Total Residual Chlorine

The acute and chronic water quality criteria for total residual chlorine for protection of aquatic life (IDAPA 16.01.02250.02.a.iii) are 19 µg/L and 11 µg/L, respectively.

It is determined that there is a reasonable potential to exceed the water quality criteria for total chlorine. Therefore, limits are necessary in the draft

permit to ensure that the discharge will not exceed water quality standards.

The draft permit contains total residual chlorine limits of 210 and 120 µg/l, as daily maximum and monthly average limits, respectively. The corresponding loadings are 1.6 and 0.9 lbs/day, respectively.

E. Phosphorus

Although the area around American Falls wastewater treatment facility is not determined to be water quality limited for phosphorus, it is upstream from the sections of the Snake river in the Walcott watershed that are on the 303d list for nutrients. The State of Idaho issued a TMDL for Lake Walcott indicating future reductions for Minidoka Dam would be required by a future TMDL. Since American Falls discharges upstream of this impaired water, EPA proposes quarterly effluent and ambient monitoring.

F. pH

In addition to limits on BOD_5 and TSS, 40 CFR 133.102 requires that effluent pH be within the range of 6.0 to 9.0 standard units for POTWs. The State water quality standards for protection of aquatic life (IDAPA 16.01.02250.02) require that ambient pH be in the range of 6.5 to 9.5 standard units.

Because pH is a logarithmic scale, the statistical approach in the TSD cannot be used to establish reasonable potential. Instead, the permit limits in the 1981 permit were compared to the water quality standards to determine whether they could cause an exceedance. Therefore, the draft permit incorporates the water quality-based minimum of 6.5 standard units and the technology-based limit of 9.0 standard units. These limits are more stringent than those in the 1981 permit (6.0 to 9.0), but American Falls has been operating within the range of the pH limit.

G. Floating, Suspended or Submerged Matter

The State water quality standards (IDAPA 16.01.02200.05) require surface waters of the State to 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.

APPENDIX D - SAMPLE EFFLUENT LIMIT CALCULATIONS

NPDES Permit Limit Calculation for Chlorine

Step 1: Determine the appropriate criteria

1A. Determine the uses

The Snake River is protected by the State of Idaho for the following uses: domestic and agricultural water supply, cold water biota, and primary and secondary recreation.

1B. Determine the most stringent criterion to protect the uses

The most stringent criterion associated with these uses is for the protection of cold water biota. The acute and chronic criteria for total chlorine residual are 19µg/l as a one-hour average and 11µg/l as a four-day average, respectively.

Step 2: Determine whether there is "reasonable potential" to exceed the criteria

2A. Determine the "reasonable potential" multiplier

The "reasonable potential" multiplier is based on the coefficient of variation (CV) of the data and the number of data points. Where there are fewer than 10 data points to calculate a CV, the TSD recommends using 0.6 as a default value. In this case, there were 163 data points, and the CV of the data set is 0.3. Using the equations in section 3.3.2. of the TSD, the "reasonable potential" multiplier (RPM) is calculated as follows:

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

where,
p_n = the percentile represented by the highest concentration
n = the number of samples

$$p_n = (1-0.99)^{1/163}$$
$$p_n = 0.97$$

This means that the largest value in the data set of 163 data points is greater than the 97th percentile.

Next, the ratio of the 99th percentile to the 97th percentile is calculated, based on the

equation:

$$C_p = \exp(z\sigma - 0.5\sigma^2)$$

where,

$\sigma^2 = \ln(CV^2 + 1)$
CV = coefficient of variation
= 0.3

$\sigma^2 = \ln(0.3^2 + 1)$
= 0.086

z = normal distribution value
= 2.33 for the 99th percentile
= 1.88 for the 97th percentile

$C_{99} = \exp(2.33*0.294 - 0.5*0.086)$
=1.90

$C_{97} = \exp(1.88*0.294 - 0.5*.086)$
= 1.665
RPM = C_{99}/C_{98}
= 1.90\1.665

RPM = 1.1

2B. Calculate the concentration of the pollutant at the edge of the mixing zone

There is reasonable potential to exceed criteria if the maximum projected concentration of the pollutant at the edge of the mixing zone exceeds the criterion. The maximum projected concentration is calculated from the following equation:

$$C_d = \frac{(C_e * Q_e) + (C_u * (Q_u * \%MZ))}{Q_e + (Q_u * \%MZ)}$$

where,

C_d = receiving water concentration at the edge of the mixing zone
C_e = maximum projected effluent concentration
= maximum reported effluent concentration * reasonable potential multiplier (0.6 mg/l *1.1= 0.66 mg/l)
Q_e = maximum effluent flow (1.40 cfs)
C_u = upstream concentration of pollutant (0 mg/l)

Q_u = upstream flow 58.0 cfs for acute, 194.1 cfs for chronic)
%MZ = % of upstream flow allowed for mixing zone (25%)

For the acute criterion, use the acute flow

$$C_d = \frac{(0.66*1.4) + (0*58*0.25)}{1.4 + (58*0.25)}$$

C_d = 0.06 mg/l

For the chronic criterion, use the chronic flow

$$C_d = \frac{(0.66*1.4) + (0*194.1*0.25)}{1.4 + (194.1*0.25)}$$

C_d = 0.02 mg/l

The projected chlorine concentrations at the edges of the acute and chronic mixing zones are greater than the criteria, therefore a limit must be included in the permit.

Step 3: Calculate the wasteload allocations

Wasteload allocations (WLAs) are calculated using the same mass balance equation used to calculate the concentration of the pollutant at the edge of the mixing zone. However, C_d becomes the acute or chronic criteria and C_e is replaced by the acute or chronic WLA. The equation is rearranged to solve for the WLA, becoming:

$$WLA_a = \frac{(C_d Q_u * \%MZ) + (C_d * Q_e) - (Q_u * C_u * \%MZ)}{Q_e}$$

For the acute criterion

$$WLA_a = \frac{(0.019*58*0.25) + (0.019*1.4) - (58*0*0.25)}{1.4}$$

WLA_a = 0.216 mg/l

For the chronic criterion

$$WLA_c = \frac{(0.011*194.1*0.25) + (0.011*1.4) - (194.1*0*0.25)}{1.4}$$

WLA_c = 0.392 mg/l

The WLAs are converted to long-term average concentrations, using the following equations from EPA's *Technical Support Document for Water Quality-based Toxics Control* (TSD):

$$LTA_a = WLA_a * \exp[0.5\sigma^2 - z\sigma]$$

$$LTA_c = WLA_c * \exp[0.5\sigma_4^2 - z\sigma_4]$$

where,

σ^2 = $\ln(CV^2 + 1)$
= 0.086
σ_4^2 = $\ln(CV^2/4 + 1)$
= 0.022
z = 2.33 for 99th percentile probability basis

LTA_a = 0.216 * exp[0.5 * 0.086 - 2.33 * 0.294]

LTA_a = 0.11 mg/l

LTA_c = 0.392 * exp[0.5 * 0.022 - 2.33 * 0.150]

LTA_c = 0.28 mg/l

The LTAs are compared and the most stringent is used to develop the daily maximum and monthly average permit limits. In this case, the acute LTA is the most stringent.

Step 4: Derive the maximum daily (MDL) and average monthly (AML) permit limits

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

$$MDL = LTA_c * \exp[z\sigma - 0.5\sigma^2]$$

where:

σ^2 = $\ln(CV^2 + 1)$
= 0.086
z = 2.33 for 99th percentile probability basis

CV = coefficient of variation

MDL= 0.11* exp[2.33 * 0.294 - 0.5 *.0.086]

MDL= 0.21 mg/l

$AML= LTA_c * exp[z\sigma - 0.5\sigma^2]$

where:

$\sigma^2 = \ln(CV^2/n + 1)$
$= 0.004$
z = 1.65 for 95th percentile probability basis
CV = coefficient of variation
n = number of sampling events required per month (21)

AML= 0.11 * exp[1.65 * 0.065 - 0.5 * 0.004]

AML= 0.12 mg/l

APPENDIX E - ENDANGERED SPECIES ACT

In the document of LISTED AND PROPOSED ENDANGERED AND THREATENED SPECIES, AND CANDIDATE SPECIES THAT MAY OCCUR WITHIN THE STATE OF IDAHO
SP #1-4-01-SP-134

The U.S. Fish and Wildlife Service identified the canadian lynx, gray wolf, bald eagle, Utah valvata snail, Bliss Rapids snail, and Ute ladies'-tresses as federally-listed endangered species. There are no proposed or candidate species in the area of the discharge. The National Oceanic and Atmospheric Administration, National Marine Fisheries Service has not identified any additional listed endangered species within the Snake River basin.

EPA has determined that the requirements contained in the draft permit will have **no effect** on the canadian lynx or gray wolf. Hunting and habitat destruction are the primary causes of the canadian lynx and gray wolf's decline. Issuance of an NPDES permit for the City of American Falls wastewater treatment facility will not result in habitat destruction, nor will it result in changes in population that could result in increased habitat destruction. Furthermore, issuance of this permit will not impact the food sources of the canadian lynx or gray wolf. The primary reasons for the decline of the bald eagle are destruction of their habitat and food sources and widespread application of DDT. This draft permit will have no impact on any these issues. Similarly, the primary reasons for the decline of the Ute ladies'-tresses are habitat destruction associated with land development, agricultural, and water system alterations. The permit will have no impact on the Ute ladies'-tresses because it does not change existing land uses or modify the species' riparian habitat. The Utah valvata snail and Bliss Rabpid snail will not be disturbed by this permit since there will be no change in the discharge into the Snake River than has occurred for the past 25 years.