Fact Sheet

**The U.S. Environmental Protection Agency (EPA)
Proposes to Reissue a National Pollutant Discharge Elimination System (NPDES) Permit to Discharge Pollutants Pursuant to the Provisions of the Clean Water Act (CWA) to:**

City of Pierce
Wastewater Treatment Facility

Public Comment Start Date: November 21, 2017
Public Comment Expiration Date: December 21, 2017

Technical Contact: Brian Nickel
206.553.6251
800-424-4372, ext. 6251 (within Alaska, Idaho, Oregon, and Washington)
nickel.brian@epa.gov

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

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

State Certification
Upon the EPA's request, the Idaho Department of Environmental Quality (IDEQ) has provided a draft certification of the 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
Lewiston Regional Office
Attn: Surface Water Manager
1118 F Street
Lewiston, Idaho 83501

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

After the Public Notice expires, and all comments have been considered, the EPA's regional Director for the Office of Water and Watersheds will make a final decision regarding permit issuance. If no substantive comments are received, the tentative conditions in the draft permit will become final, and the permit will become effective upon issuance. If substantive comments are received, the 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 pursuant to 40 CFR 124.19.

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

US EPA Region 10
Suite 900
1200 Sixth Avenue, OWW-191
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:

EPA Idaho Operations Office
950 W Bannock Suite 900
Boise, ID 83702
Phone: 208-378-5746

Idaho Department of Environmental Quality
Lewiston Regional Office
Attn: Surface Water Manager
1118 F Street
Lewiston, Idaho 83501
208-799-4370

Table of Contents

Acronyms 5

I. Applicant 7

A. General Information 7
B. Permit History 7

II. Facility Information 7

A. Treatment Facility Description 7
B. Background Information 8

III. Receiving Water 9

A. Low Flow Conditions 10
B. Water Quality Standards 10
C. Water Quality Limited Waters 11

IV. Effluent Limitations and Monitoring 11

A. Basis for Effluent Limitations 11
B. Proposed Effluent Limitations 11
C. Compliance Schedules 13
D. Antibacksliding 13

V. Monitoring Requirements 14

A. Basis for Effluent Limits and Surface Water Monitoring 14
B. Effluent Monitoring 14
C. Surface Water Monitoring 15
D. Electronic Submission of Discharge Monitoring Reports 15

VI. Sludge (Biosolids) Requirements 15

VII. Other Permit Conditions 16

A. Quality Assurance Plan 16
B. Operation and Maintenance Plan 16
C. Sanitary Sewer Overflows and Proper Operation and Maintenance of the Collection System 16
D. Industrial Waste Management Requirements 17

VIII. Other Legal Requirements 18

A. Endangered Species Act 18
B. Essential Fish Habitat 18
C. Environmental Justice 18
D. State Certification 19
E. Permit Expiration 19

IX. References 19

Appendix A: Facility Information 20

Appendix B: Basis for Effluent Limits 25

A. Technology-Based Effluent Limits 25
B. Water Quality-Based Effluent Limits 25

Appendix C – Reasonable Potential and Water Quality-based Effluent Limits 29

Appendix D – Endangered Species Act 37

A. Overview 37
B. Species Lists 37
C. Potential Impacts from the Discharge on Listed Species 37
D. Conclusion 41
E. References 41

Appendix E – Essential Fish Habitat Assessment 42

A. Listing of EFH Species in the Facility Area 42
B. Description of the Facility and Discharge Location 42
C. The EPA's Evaluation of Potential Effects to EFH 42

Appendix F – Draft Clean Water Act Section 401 Certification 44

Acronyms

µg/L	micrograms per liter
30Q5	30 day, 5 year low flow
AML	Average monthly limit
BOD	Biological oxygen demand
CCC	Criterion continuous concentration
cfs	cubic feet per second
CMC	Criterion maximum concentration
CMOM	Capacity, management, operation, and maintenance
CV	Coefficient of variation
CWA	Clean Water Act
DMR	Discharge Monitoring Report
EPA	Environmental Protection Agency
ESA	Endangered Species Act
I/I	Inflow and infiltration
IDAPA	Numbering designation for all administration rules in Idaho promulgated in accordance with the Idaho Administrative Procedure Act
IDEQ	Idaho Department of Environmental Quality
LA	Load allocation
LTA	Long-term allocation
MDL	Maximum daily limit
mg/L	milligrams per liter
mgd	million gallons per day
MOEC	Maximum observed effluent concentration
MOS	Margin of safety
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NWIS	National Water Information System
POTW	Privately owned treatment works
QAP	Quality Assurance Plan
RPFM	Reasonable potential multiplying factor
SSO	Separate sanitary overflow

STORET	EPA STOrage and RETrieval
TBEL	Technology-based effluent limit
TMDL	Total maximum daily load
TRC	Total residual chlorine
TSD	EPA Technical Support Document
TSS	Total suspended solids
USFWS	US Fish and Wildlife Service
USGS	US Geological Survey
WLA	Wasteload allocation
WQBEL	Water quality-based effluent limit
WQS	Water quality standard
WWTF	Wastewater treatment facility

I. Applicant

A. General Information

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

City of Pierce
Wastewater Treatment Facility
NPDES Permit #ID0020206

Physical Address:
13 Fromelt Road
Pierce, Idaho 83546

Mailing Address:
P.O. Box 356
Pierce, Idaho 83546

Contact:
John Stinson
Operator
jstinson@cityofpierce.com

B. Permit History

The most recent NPDES permit for the City of Pierce Wastewater Treatment Facility (WWTF) was issued on March 5, 2004, became effective on May 1, 2004, and expired on April 30, 2009. An NPDES application for permit issuance was submitted by the permittee on November 5, 2008. The 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.

II. Facility Information

A. Treatment Facility Description

Service Area

The City of Pierce owns, operates, and maintains a WWTF located in Pierce, Idaho. The collection system has no combined sewers. The facility serves a resident population of 617 and discharges continuously to Orofino Creek. The facility's design flow is 0.3 million gallons per day (mgd). Because the design flow is less than 1 mgd, the facility is considered a minor facility.

Treatment Process

Details about the wastewater treatment process and a map showing the location of the treatment facility and discharge are included in Appendix A. There are no major industries discharging to the facility. The treatment process consists of activated sludge, disinfection using chlorine, and dechlorination.

B. Background Information

Effluent Characterization

In order to determine pollutants of concern for further analysis, EPA evaluated the application form, additional discharge data, and the nature of the discharge. Pollutants of concern for this facility are five-day biological oxygen demand (BOD_5), total suspended solids (TSS), *E. coli*, pH, ammonia, and total residual chlorine (TRC).

Compliance History

The EPA reviewed discharge monitoring report (DMR) data from 2004 to April 2017. A summary of effluent violations is provided in Table 1 below.

A review of the WWTF's submitted DMRs indicates many instances of violations, including TRC, E. coli, TSS, and BOD_5, related largely to excessive inflow and infiltration (I/I). During the wet weather season, flows at the WWTF frequently exceed the hydraulic capacity of the facility, causing washout of the biological process and a reduction in contact time in the chlorine contact basin. Investigations by Mountain Waterworks and Dr. Pipeline CCTV have noted extensive damage to the collection system, including leaking concrete manholes, cracked or damaged pipes, tree root intrusion, broken connections, and leaking service lines.

In response to the hydraulic overload, the operator has increased the chlorine dose to reduce violations of the E. coli limit. With installation of a tablet dechlorination system in June 2012, chlorine violations have occurred less frequently.

The facility has been in non-compliance status for 52 consecutive quarters.

The EPA and the City of Pierce entered into an Administrative Order of Consent in May 2017. The order specifies that the facility must make repairs and improvements in two phases. Phase I will repair the collection system to reduce I/I, improve the facility's backwash handling system, and add a mechanical sludge dewatering system. Phase II will install a redundant wastewater treatment plant to supplement the facility, upgrade the disinfection system, and replace outdated process equipment.

A list of violations from January 1, 2012 through July 20, 2017 are presented in Table 1.

Table 1 - Effluent limit violations (01/01/2012 – 07/20/2017)

Violation	Date
001 A 51040 E. coli Effluent Gross Season ID:0 C3	2/29/2012
001 B 50060 Chlorine, total residual Effluent Gross Season ID:0 Q1	2/29/2012
001 B 50060 Chlorine, total residual Effluent Gross Season ID:0 Q2	2/29/2012
001 B 50060 Chlorine, total residual Effluent Gross Season ID:0 C2	2/29/2012
001 B 50060 Chlorine, total residual Effluent Gross Season ID:0 C3	2/29/2012
001 A 51040 E. coli Effluent Gross Season ID:0 C2	3/31/2012
001 A 51040 E. coli Effluent Gross Season ID:0 C3	3/31/2012
001 A 51040 E. coli Effluent Gross Season ID:0 C2	4/30/2012
001 A 51040 E. coli Effluent Gross Season ID:0 C3	4/30/2012
001 B 50060 Chlorine, total residual Effluent Gross Season ID:0 Q1	4/30/2012
001 B 50060 Chlorine, total residual Effluent Gross Season ID:0 Q2	4/30/2012

Violation	Date
001 B 50060 Chlorine, total residual Effluent Gross Season ID:0 C2	4/30/2012
001 B 50060 Chlorine, total residual Effluent Gross Season ID:0 C3	4/30/2012
001 B 50060 Chlorine, total residual Effluent Gross Season ID:0 C3	6/30/2013
001 A 51040 E. coli Effluent Gross Season ID:0 C3	7/31/2013
001 A 51040 E. coli Effluent Gross Season ID:0 C3	8/31/2013
001 A 51040 E. coli Effluent Gross Season ID:0 C3	3/31/2014
001 A 81010 BOD, 5-day, percent removal Percent Removal Season ID:0 C1	3/31/2014
001 B 50060 Chlorine, total residual Effluent Gross Season ID:0 Q2	3/31/2014
001 A 00530 Solids, total suspended Effluent Gross Season ID:0 Q1	4/30/2014
001 A 00530 Solids, total suspended Effluent Gross Season ID:0 C2	4/30/2014
001 A 00530 Solids, total suspended See Comments Season ID:0 Q1	4/30/2014
001 A 81011 Solids, suspended percent removal Percent Removal Season ID:0 C1	4/30/2014
001 B 50060 Chlorine, total residual Effluent Gross Season ID:0 Q1	4/30/2014
001 B 50060 Chlorine, total residual Effluent Gross Season ID:0 Q2	4/30/2014
001 A 51040 E. coli Effluent Gross Season ID:0 C2	11/30/2014
001 A 51040 E. coli Effluent Gross Season ID:0 C3	11/30/2014
001 A 51040 E. coli Effluent Gross Season ID:0 C3	2/28/2015
001 B 50060 Chlorine, total residual Effluent Gross Season ID:0 Q2	2/28/2015
001 A 81011 Solids, suspended percent removal Percent Removal Season ID:0 C1	4/30/2015
001 A 00530 Solids, total suspended Effluent Gross Season ID:0 C2	7/31/2015
001 A 81011 Solids, suspended percent removal Percent Removal Season ID:0 C1	7/31/2015
001 A 51040 E. coli Effluent Gross Season ID:0 C2	11/30/2015
001 A 51040 E. coli Effluent Gross Season ID:0 C3	11/30/2015
001 A 51040 E. coli Effluent Gross Season ID:0 C3	2/29/2016
001 A 51040 E. coli Effluent Gross Season ID:0 C3	3/31/2016
001 B 50060 Chlorine, total residual Effluent Gross Season ID:0 Q2	3/31/2016
001 A 51040 E. coli Effluent Gross Season ID:0 C3	6/30/2016
001 B 50060 Chlorine, total residual Effluent Gross Season ID:0 Q2	1/31/2017
001 A 51040 E. coli Effluent Gross Season ID:0 C2	2/28/2017
001 A 51040 E. coli Effluent Gross Season ID:0 C3	2/28/2017
001 B 50060 Chlorine, total residual Effluent Gross Season ID:0 Q2	3/31/2017
001 A 81010 BOD, 5-day, percent removal Percent Removal Season ID:0 C1	4/30/2017
001 A 51040 E. coli Effluent Gross Season ID:0 C3	5/31/2017
001 A 81010 BOD, 5-day, percent removal Percent Removal Season ID:0 C1	6/30/2017

The detailed facility report can be found through EPA's Enforcement and Compliance History Online (ECHO) system at:

https://echo.epa.gov/detailed-facility-report?fid=ID0020206&sys=ICP

III. Receiving Water

The facility discharges treated effluent continuously from an open pipe at the bank of Orofino Creek near Pierce, Idaho.

A. Low Flow Conditions

The low flow conditions of a water body are used to determine water quality-based effluent limits (WQBELs). In general, Idaho's water quality standards (WQS) require criteria be evaluated at the following low flow receiving water conditions (see IDAPA 58.01.02.210.03):

Acute aquatic life	1Q10 or 1B3
Chronic aquatic life	7Q10 or 4B3
Non-carcinogenic human health criteria	30Q5
Carcinogenic human health criteria	Harmonic mean
Ammonia (chronic)	30Q10, 30Q5, or 30B3

There are no active US Geological Survey (USGS) stream gages near the discharge, and the nearest stream gage with sufficient data for analysis is also inactive and is approximately 30 miles downstream. These data are from the 1980s. Therefore, the USGS StreamStats program was used to estimate critical low flows (USGS 2012).

Table 2 – Estimated Critical Low Flows for Orofino Creek

1Q10 (cfs)	7Q10 (cfs)	30Q5 (cfs)
5.9	7.0	9.57

B. Water Quality Standards

Section 301(b)(1)(C) of the Clean Water Act (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 antidegradation policy.

The use classification system designates the beneficial uses that each water body is expected to achieve, such as drinking water supply, contact recreation, and aquatic life. The numeric and narrative water quality criteria are the criteria deemed necessary to support the beneficial use classification of each water body. The antidegradation policy represents a three-tiered approach to maintain and protect various levels of water quality and uses.

Designated Beneficial Uses

This section of Orofino Creek is designated for primary contact recreation, cold water aquatic life, and salmonid spawning. As of the 2014 EPA-approved Integrated Report, this section of Orofino Creek is fully supporting its designated uses.

Surface Water Quality

There are no USGS National Water Information System (NWIS) or EPA STOrage and RETrieval (STORET) datasets available in the vicinity of the discharge. However, the facility collected ammonia, pH, and temperature data upstream of the discharge between December 2006 and November 2011. These data were used to calculate the 95th percentile temperature and pH to be used in effluent limit development.

95th Percentile Temperature: 16.95 °C

95th Percentile pH: 7.5

Antidegradation

The IDEQ has completed an antidegradation review which is included in the draft 401 certification for this permit (see Appendix F). The EPA has reviewed this antidegradation analysis and finds that it is consistent with the State's water quality standards and the State's antidegradation implementation procedures. Comments on the 401 certification including the antidegradation review can be submitted to the IDEQ as set forth above (see State Certification on Page 1 of this Fact Sheet).

C. Water Quality Limited Waters

Any waterbody for which the water quality does not, and/or is not expected to meet, applicable water quality standards is defined as a "water quality limited segment."

Section 303(d) of the CWA requires states to develop a total maximum daily load (TMDL) management plan for water bodies determined to be water quality-limited segments. A TMDL is a detailed analysis of the water body to determine its assimilative capacity. The assimilative capacity is the loading of a pollutant that a water body can assimilate without causing or contributing to a violation of water quality standards. Once the assimilative capacity of the water body has been determined, the TMDL will allocate that capacity among point and non-point pollutant sources, taking into account natural background levels and a margin of safety (MOS). Allocations for non-point sources are known as load allocations (LAs). The allocations for point sources, known as waste load allocations (WLAs), are implemented through effluent limitations in NPDES permits. Effluent limitations for point sources must be consistent with applicable TMDL allocations.

Because Orofino Creek meets all applicable water quality standards, no TMDL exists or is needed for the waterbody.

IV. Effluent Limitations and Monitoring

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 (TBELs) or WQBELs. TBELs are set according to the level of treatment that is achievable using available technology. A WQBEL is designed to ensure that the WQS applicable to a waterbody are being met and may be more stringent than TBELs. The basis for the effluent limits proposed in the draft permit is provided in Appendix B.

B. Proposed Effluent Limitations

The following summarizes the proposed effluent limits in the draft permit:

Table 3 – Proposed Effluent Limits and Monitoring Requirements

Parameter	Units	Effluent Limitations			Monitoring Requirements		
		Average Monthly	Average Weekly	Maximum Daily	Sample Location	Sample Frequency	Sample Type
Parameters With Effluent Limits							
Biochemical Oxygen Demand (BOD_5)	mg/L	30	45	--	Influent and Effluent	2/month	8-hour composite
	lb/day	75	113	--			Calculation[1]
BOD_5 Percent Removal	%	85 (minimum)	--	--	--	1/month	Calculation[2]
Total Suspended Solids (TSS)	mg/L	30	45	--	Influent and Effluent	2/month	8-hour composite
	lb/day	75	113	--			Calculation[1]
TSS Percent Removal	%	85 (minimum)	--	--	--	1/month	Calculation[2]
E. coli[3]	CFU/ 100 ml	126	--	406 (instant. max)[5]	Effluent	5/month	Grab
Total Residual Chlorine	µg/L	27	--	80	Effluent	1/week	Grab
	lb/day	0.07	--	0.20			Calculation[1]
pH	std units	Between 6.5 – 9.0			Effluent	1/week	Grab
Total Ammonia (as N)	mg/L	17.8	--	46	Effluent	1/week	8-hour composite
	lb/day	44.5		115			Calculation[1]
Report Parameters							
Flow	mgd	Report	--	Report	Effluent	Continuous	Measurement
Temperature	°C	Report	--	Report	Effluent	1/week	Grab
Permit Application Effluent Testing Data[6]					Effluent	1/year	--

Parameter	Units	Effluent Limitations			Monitoring Requirements		
		Average Monthly	Average Weekly	Maximum Daily	Sample Location	Sample Frequency	Sample Type

Notes

1. Loading (in lb/day) is calculated by multiplying the concentration (in mg/L) by the corresponding flow (in mgd) for the day of sampling and a conversion factor of 8.34. For more information on calculating, averaging, and reporting loads and concentrations see the *NPDES Self-Monitoring System User Guide* (EPA 833-B-85-100, March 1985).
2. Percent Removal. 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 using the following equation: (average monthly influent concentration – average monthly effluent concentration) ÷ average monthly influent concentration x 100. Influent and effluent samples must be taken over approximately the same time period.
3. The average monthly *E. coli* bacteria counts must not exceed a geometric mean of 126/100 ml based on a minimum of five samples taken every 3 - 7 days within a calendar month.
4. The average monthly limit for chlorine is not quantifiable using EPA-approved analytical methods. The minimum level (ML) for chlorine is 50 µg/L. The EPA will use 50 µg/L as the compliance evaluation level for this parameter. The permittee will be compliant with the total residual chlorine limitations if the average monthly concentration is less than 50 µg/L and the average monthly and mass loading is less than 0.13 lb/day.
5. Reporting is required within 24 hours of a maximum daily limit or instantaneous maximum limit violation.
6. Permit Application Effluent Testing Data - See NPDES Permit Application Form 2A, Part B.6 for the list of pollutants to be included in this testing. The Permittee must use sufficiently sensitive analytical methods in accordance with the permit.
7. Upstream monitoring for ammonia must begin at least two years before the permit renewal date, for a total of eight samples, and be submitted with the permit renewal application. These samples should be taken concurrently with quarterly pH and temperature samples.

C. Compliance Schedules

Compliance schedules are authorized by federal NPDES regulations at 40 CFR 122.47 and Idaho WQS at IDAPA 58.01.02.400.03. Compliance schedules allow a discharger to phase in, over time, compliance with WQBELs when limitations are in the permit for the first time. Additionally, the federal regulations at 40 CFR 122.47 require that the compliance schedules require compliance with effluent limits as soon as possible and that, when the compliance schedule is longer than one year, the schedule shall set forth interim requirements and the dates for their achievement. The time between the interim dates shall generally not exceed one year, and when the time necessary to complete any interim requirement is more than one year, the schedule shall require reports on progress toward completion of these interim requirements.

In order to grant a compliance schedule the permitting authority must make a reasonable finding that the discharger cannot immediately comply with the WQBELs upon the effective date of the permit and that a compliance schedule is appropriate (see 40 CFR 122.47(a)). The EPA has determined that the permittee can comply with the new water quality-based effluent limits for ammonia and chlorine immediately on the effective date of the final permit. Therefore, no compliance schedules are proposed in the draft permit.

D. Antibacksliding

Section 402(o) of the Clean Water Act and federal regulations at 40 CFR §122.44(l) generally prohibit the renewal, reissuance or modification of an existing NPDES permit that contains effluent limits, permit conditions or standards that are less stringent than those established in the previous permit (i.e., antibacksliding) but provides limited exceptions. For explanation of the antibacksliding exceptions refer to Chapter 7 of the Permit Writers Manual *Final Effluent Limitations and Anti-backsliding*.

An antibacksliding analysis was done for the Pierce WWTF. The analysis for each parameter is detailed below:

- Ammonia – The previous permit had no ammonia limit. Therefore, antibacksliding does not apply.
- Chlorine – The new maximum daily limit (80 µg/L) is more stringent than the previous maximum daily limit (100 µg/L), and the new average monthly limit (27 µg/L) is more stringent than the previous average monthly limit (40 µg/L). Therefore, antibacksliding does not apply.
- BOD_5 – No change
- TSS – No change
- pH – No change
- E. coli – No change

V. Monitoring Requirements

A. Basis for Effluent Limits and Surface Water Monitoring

Section 308 of the CWA and 40 CFR 122.44(i) require monitoring in permits to determine compliance with effluent limitations. Monitoring may also be required to gather effluent and surface water data to determine if additional effluent limitations are required and/or to monitor effluent impacts on receiving water quality.

The permit also requires the permittee to perform effluent monitoring required by the NPDES Form 2A application, 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 DMRs or on the application for renewal, as appropriate, to the EPA.

B. Effluent Monitoring

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

See Table 3 for monitoring requirements.

Monitoring Changes from the Previous Permit

The monitoring frequency for ammonia has been increased relative to the previous permit, in order to determine compliance with the new water quality-based effluent limits for ammonia.

Because there have been violations of effluent limits for BOD_5 and TSS concentration, loading, and removal rate in the past five years, the EPA proposes to increase the monitoring frequency for BOD and TSS from once per month to twice per month. This will allow the EPA to better determine compliance with the BOD_5 and TSS limits.

The EPA proposes to require effluent monitoring for temperature once per week. The previous permit requires weekly effluent monitoring for pH and chlorine using a grab sample, and the EPA proposes to continue this monitoring in the reissued permit. Thus, weekly temperature monitoring will not be burdensome, since the permittee can simply measure the temperature of the same grab samples used for pH and chlorine sampling.

C. Surface Water Monitoring

In general, surface water monitoring may be required for pollutants of concern to assess the assimilative capacity of the receiving water for the pollutant. In addition, surface water monitoring may be required for pollutants for which the water quality criteria are dependent and to collect data for TMDL development if the facility discharges to an impaired water body. Table 4 presents the proposed surface water monitoring requirements for the draft permit.

Surface water monitoring results must be reported on the monthly DMR, and a report of all results must be submitted with the reapplication for the next permit. Quarterly monitoring must occur once during each of the following quarters: January – March, April – June, July – September, and October – December.

Table 4 - Surface Water Monitoring Requirements

Parameter	Units	Frequency	Sample Type
Total Ammonia as N	mg/L	1/quarter[2]	Grab
Total Nitrogen	mg/L	1/quarter	Grab
Total Phosphorous	µg/L	1/quarter	Grab
Temperature	°C	1/quarter	Grab
pH	standard units	1/quarter	Grab

Notes:

1. For quarterly monitoring frequency, quarters are defined as: January 1 to Mach 31; April 1 to June 30; July 1 to September 30; and, October 1 to December 31.
2. Upstream monitoring for ammonia must begin at least two years before the permit renewal date, for a total of eight samples, and be submitted with the permit renewal application. These samples should be taken concurrently with quarterly pH and temperature samples.

D. Electronic Submission of Discharge Monitoring Reports

The draft permit requires that the permittee submit DMR data electronically using NetDMR. NetDMR is a national web-based tool that allows DMR data to be submitted electronically via a secure Internet application.

The EPA currently conducts free training on the use of NetDMR. Further information about NetDMR, including upcoming trainings and contacts, is provided on the following website: https://netdmr.epa.gov.

VI. Sludge (Biosolids) Requirements

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

biosolids. The EPA may issue a sludge-only permit to each facility at a later date, as appropriate.

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

VII. Other Permit Conditions

A. Quality Assurance Plan

In order to ensure compliance with the federal regulation at 40 CFR 122.41(e) for proper operation and maintenance, the draft permit 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 Pierce is required to update the Quality Assurance Plan (QAP) within 180 days of the effective date of the final permit. The QAP must include standard operating procedures the permittee must follow for collecting, handling, storing and shipping samples, laboratory analysis, and data reporting. The plan must be retained on site and be made available to the EPA and the IDEQ upon request.

B. Operation and Maintenance Plan

The permit requires the City of Pierce to properly operate and maintain all facilities and system 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 permit. The plan must be retained on site and made available to the EPA and the IDEQ upon request.

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

Untreated or partially treated discharges from separate sanitary sewer systems are referred to as sanitary sewer overflows (SSOs). SSOs may present serious risks of human exposure when released to certain areas, such as streets, private property, basements, and receiving waters used for drinking water, fishing and shell fishing, 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 limits that are based upon secondary treatment. Further, discharges must meet any more stringent effluent limits that are established to meet the EPA-approved WQS.

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

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

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

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

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

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

The permittee may refer to the Guide for Evaluating Capacity, Management, Operation, and Maintenance (CMOM) Programs at Sanitary Sewer Collection Systems (EPA 305-B-05-002). This guide identifies some of the criteria used by the EPA inspectors to evaluate a collection 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.

D. Industrial Waste Management Requirements

EPA implements and enforces the National Pretreatment Program regulations of 40 CFR 403, per authority from sections 204(b)(1)(C), 208(b)(2)(C)(iii), 301(b)(1)(A)(ii), 301(b)(2)(A)(ii), 301(h)(5) and 301(i)(2), 304(e) and (g), 307, 308, 309, 402(b, 405, and 501(a) of the Federal Water Pollutant Control Act as amended by the CWA of 1977.

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

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. The EPA has determined that the discharge will have no effect on threatened or endangered species. See Appendix D.

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 the EPA to consult with NOAA Fisheries when a proposed discharge has the potential to adversely affect EFH (i.e., reduce quality and/or quantity of EFH).

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

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

C. Environmental Justice

As part of the permit development process, the EPA Region 10 conducted a screening analysis to determine whether this permit action could affect overburdened communities. "Overburdened" communities can include minority, low-income, tribal, and indigenous populations or communities that potentially experience disproportionate environmental harms and risks. The EPA used a nationally consistent geospatial tool that contains demographic and environmental data for the United States at the Census block group level. This tool is used to identify permits for which enhanced outreach may be warranted.

The WWTF is not located within or near a Census block group that is potentially overburdened. The draft permit does not include any additional conditions to address environmental justice.

Regardless of whether a treatment plant is located near a potentially overburdened community, the EPA encourages permittees to review (and to consider adopting, where appropriate) Promising Practices for Permit Applicants Seeking EPA-Issued Permits: Ways To Engage Neighboring Communities (see https://www.federalregister.gov/d/2013-10945/p-94). Examples of promising practices include: thinking ahead about community's characteristics and the effects of the permit on the community, engaging the right community leaders, providing progress or status reports, inviting members of the community for tours of

the facility, providing informational materials translated into different languages, setting up a hotline for community members to voice concerns or request information, follow up, etc.

For more information, please visit https://www.epa.gov/environmentaljustice and Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.[1]

D. State Certification

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

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. https://www3.epa.gov/npdes/pubs/owm0264.pdf

EPA. 2010. NPDES Permit Writers' Manual. Environmental Protection Agency, Office of Wastewater Management, EPA-833-K-10-001. https://www.epa.gov/sites/production/files/2015-09/documents/pwm_2010.pdf

U.S. Geological Survey. 2012. The StreamStats program. Online at: http://streamstats.usgs.gov

[1] https://www.archives.gov/federal-register/executive-orders/1994.html#12898

Appendix A: Facility Information

General Information

NPDES ID Number:	ID0020206
Physical Location:	13 Fromelt Road, Pierce, Idaho 83546
Mailing Address:	P.O. Box 356, Pierce, Idaho 83546

Facility Information

Type of Facility:	Publicly Owned Treatment Works (POTW)
Treatment Train:	Mechanical package facility, chlorination, and dechlorination (detention tank and tablets)
Flow:	0.3 mgd
Outfall Location:	46.49250, -115.80111

Receiving Water Information

Receiving Water:	Orofino Creek
Subbasin:	Clearwater (HUC 17060306)
Beneficial Uses:	Primary contact recreation, cold water aquatic life, salmonid spawning
Water Quality Limited Segment:	This creek is not listed as water quality limited.

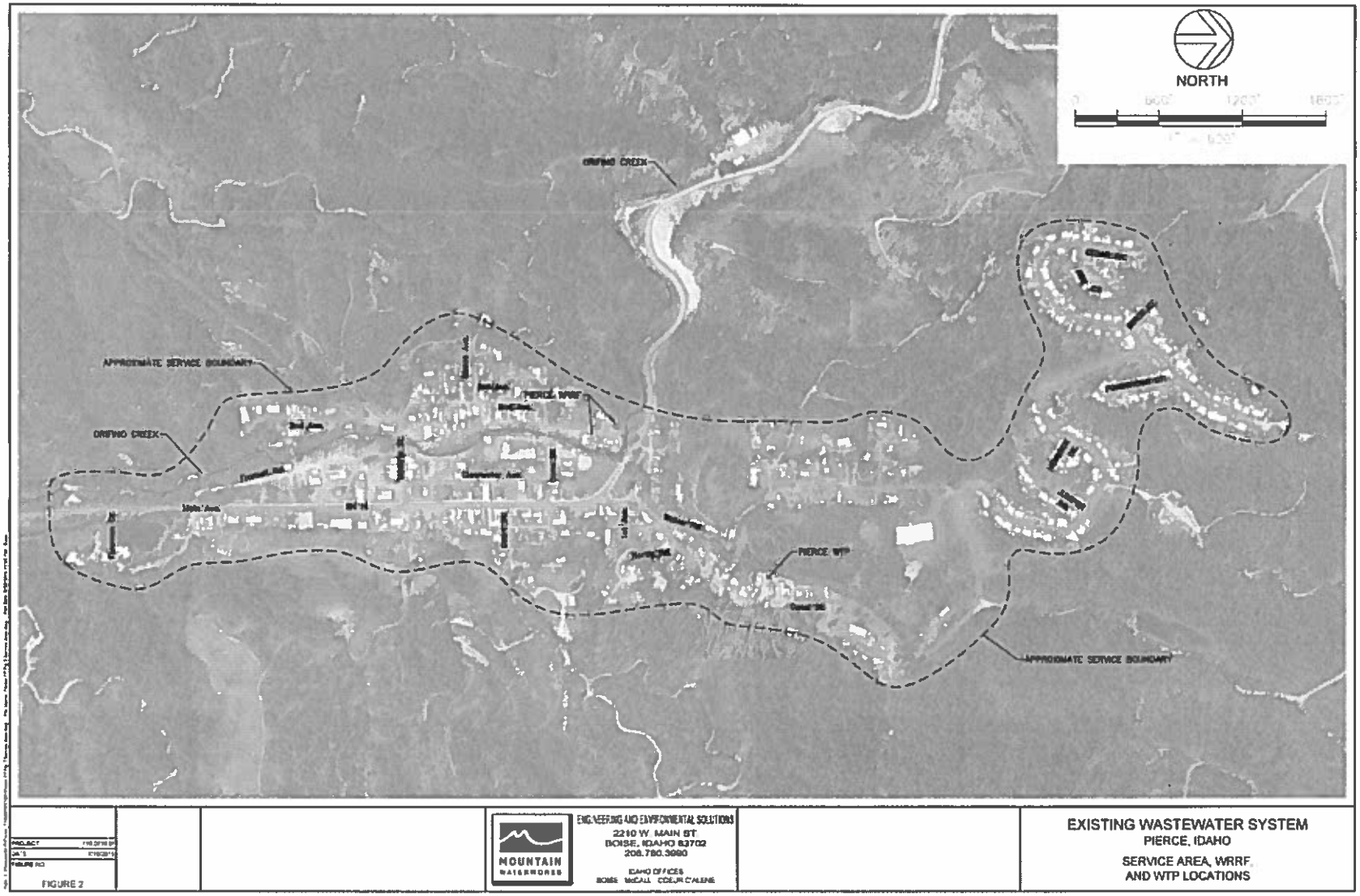

Figure 1. Existing wastewater system

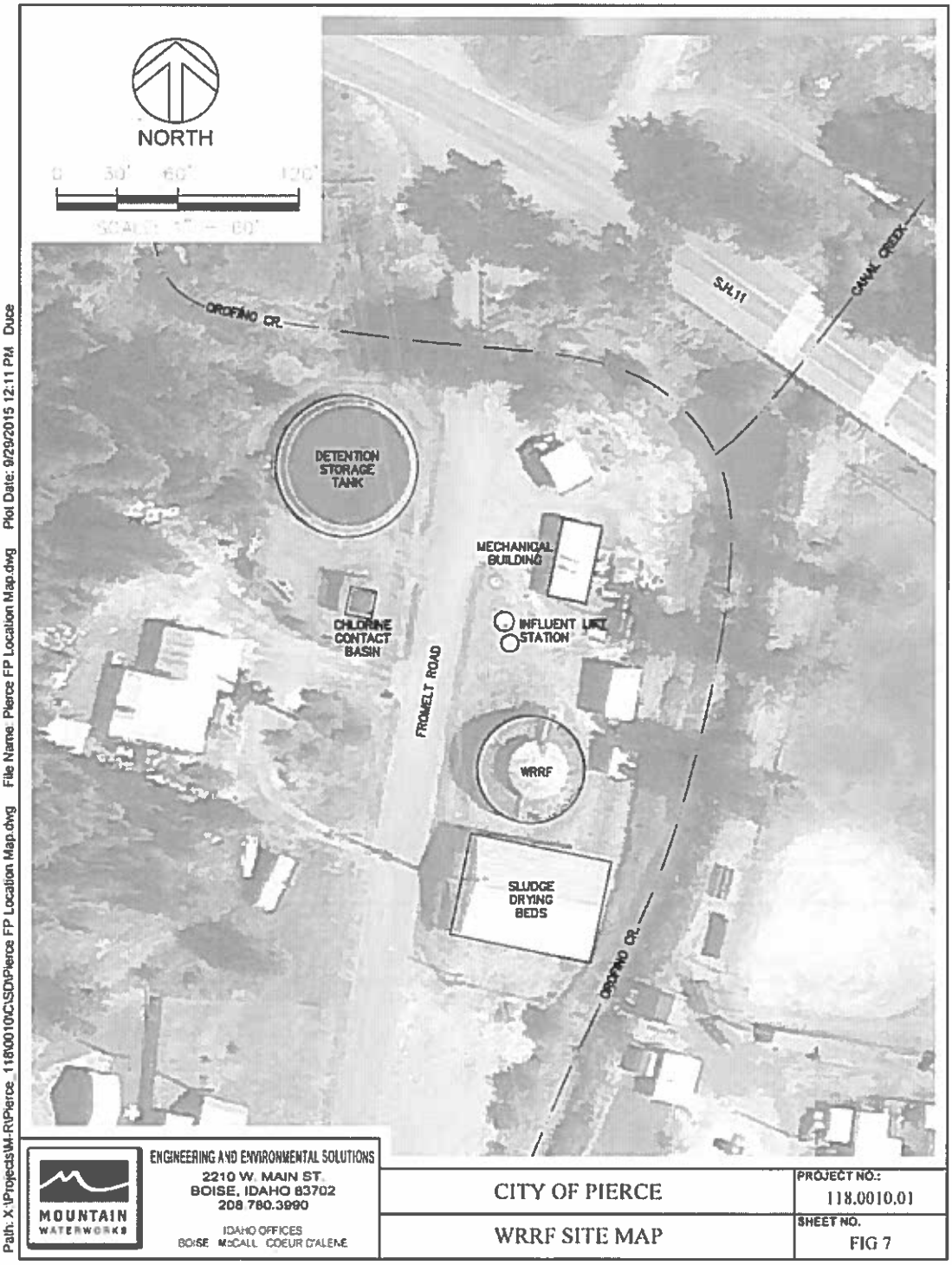

Figure 2 – Pierce wastewater treatment facility site map

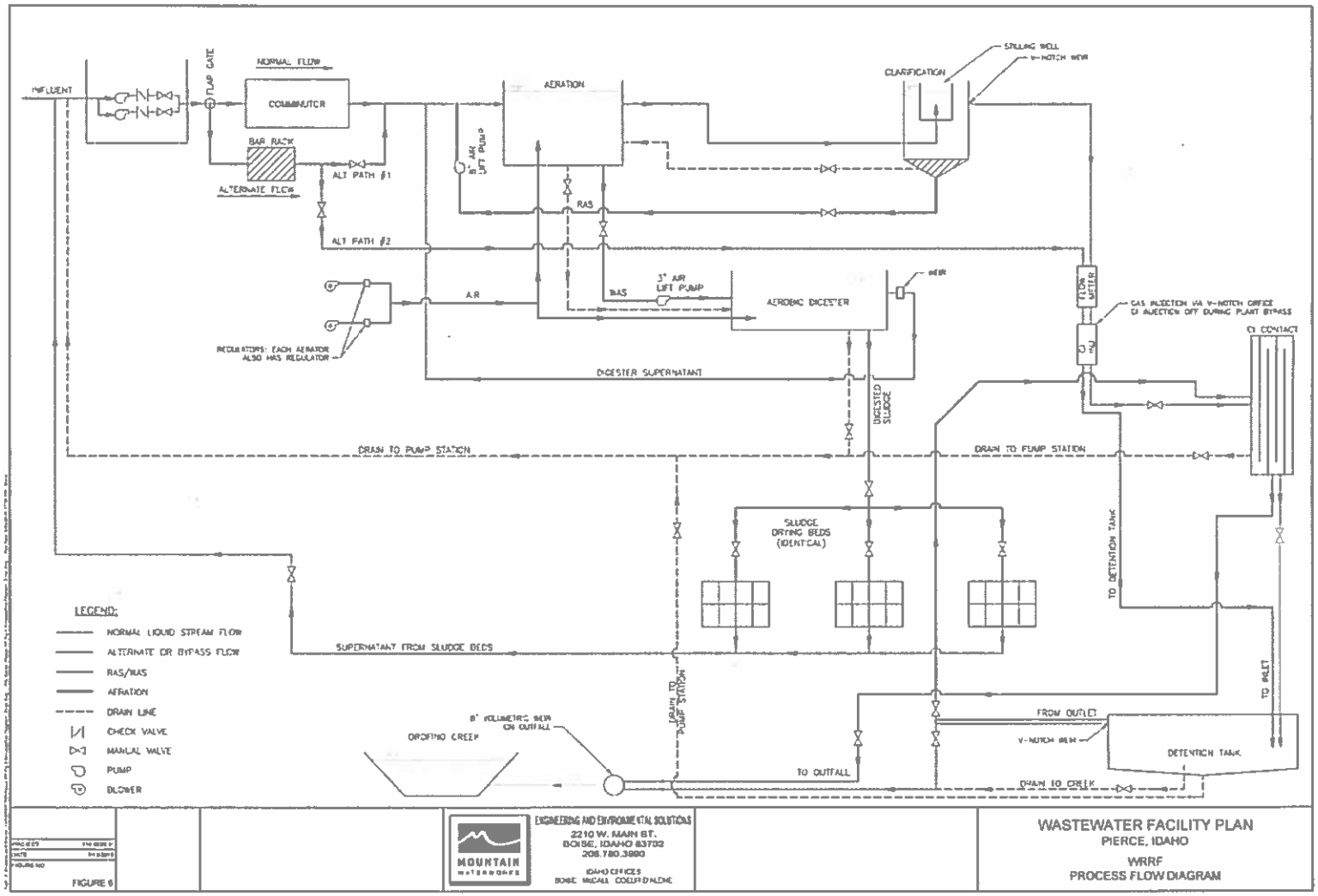

Figure 3 - Process flow diagram

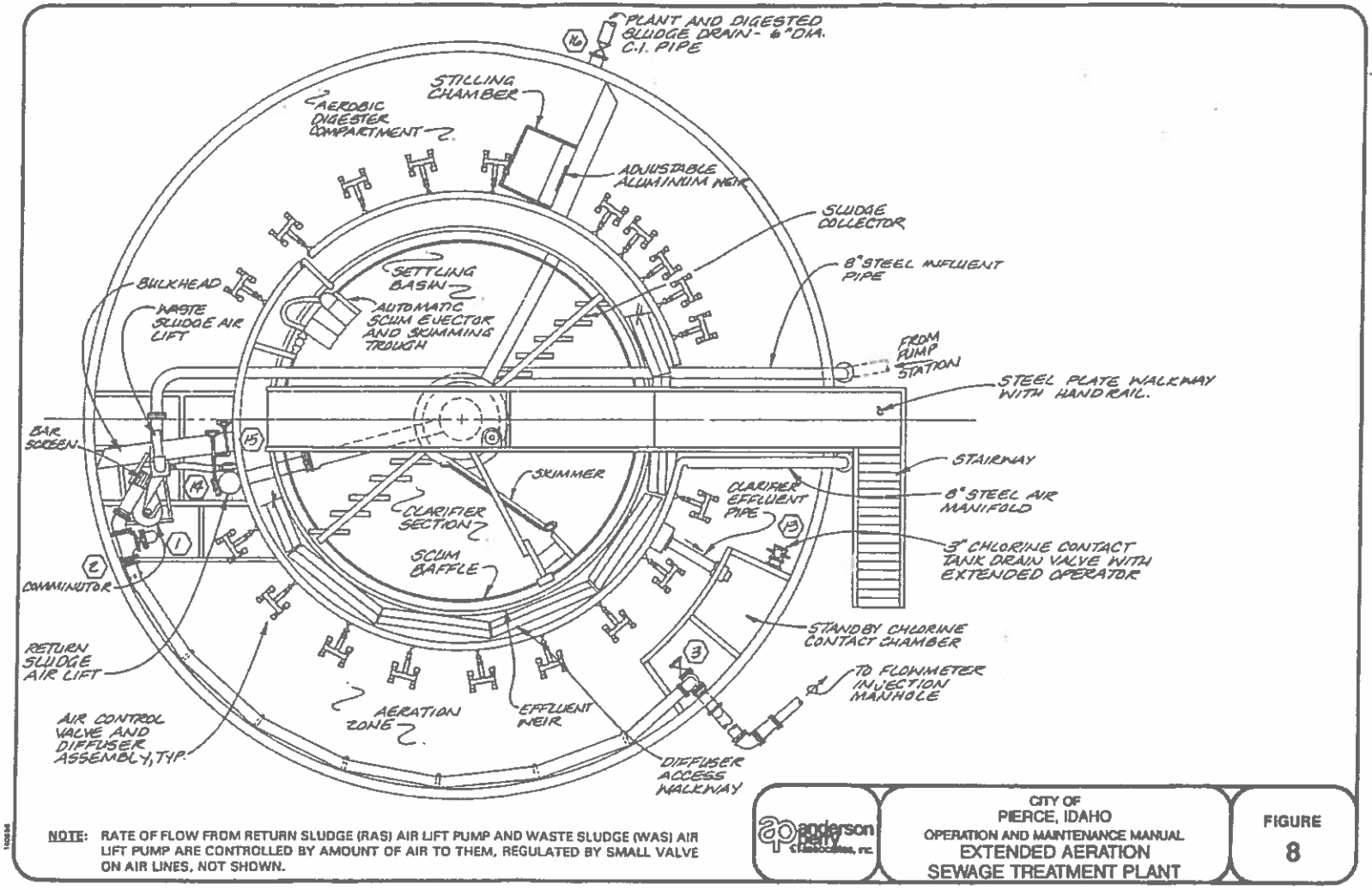

Figure 4 - Extended aeration sewage treatment plant

Appendix B: Basis for Effluent Limits

The following discussion explains the derivation of TBELs and WQBELs proposed in the draft permit.

A. Technology-Based Effluent Limits

Federal Secondary Treatment Effluent Limits

The CWA requires POTWs to meet performance-based requirements based on available wastewater treatment technology. Section 301 of the CWA established a required performance level, referred to as secondary treatment, which all POTWs were required to meet by July 1, 1977. The EPA has developed and promulgated secondary treatment effluent limits, which are found in 40 CFR 133. These TBELs apply to all municipal wastewater treatment facilities and identify the minimum level of effluent quality attainable by application of secondary treatment in terms of BOD_5, TSS, and pH. The federally promulgated secondary treatment effluent limits are listed below in Table 5.

Table 5 – Federal secondary treatment standards (40 CFR 133.102)

Parameter	30-day average	7-day average
BOD_5	30 mg/L	45 mg/L
TSS	30 mg/L	45 mg/L
Removal for BOD_5 and TSS	85% minimum	--
pH	Between 6.0 and 9.0 standard units	

B. Water Quality-Based Effluent Limits

Section 301(b)(1)(C) of the CWA requires the development of limits in permits necessary to meet WQS by July 1, 1977. Discharges to State or Tribal waters must also comply with limits 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 requirements 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 that are or may be discharged at a level that will cause, have the reasonable potential to cause, or contribute to an excursion above any State or Tribal WQS, 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 WQS.

The regulations require the permitting authority to make this evaluation using procedures that 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 WQS are met, and must be consistent with any available WLA.

Reasonable Potential Analysis

When evaluating the effluent to determine if WQBELs 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 WQS, and a WQBEL is required.

Ammonia

Ammonia criteria are based on a formula that relies on the pH and temperature of the receiving water 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. Appendix C details the equations used to determine water quality criteria for ammonia.

The facility's DMRs provided 12 ammonia data points from January 2006 through December 2006 for the facility's effluent. An additional 21 data points for the facility's effluent (quarterly, 2007-2009 and 2016-2017) and 22 for upstream monitoring were provided (quarterly, 2006-2011). The maximum observed effluent concentration (MOEC) was 15.9 mg/L, with an average value of 3.84 mg/L.

A reasonable potential calculation showed that the facility's discharge would have the reasonable potential to cause or contribute to a violation of the water quality criteria for ammonia. Therefore, the draft permit contains a WQBEL for ammonia. The draft permit requires that the permittee monitor the receiving water for ammonia quarterly beginning at least two years before the renewal date in order to determine the background ammonia concentration for the next permit reissuance. These ammonia samples should be taken concurrently with the temperature and pH samples. See Appendix C for reasonable potential and effluent limit calculations for ammonia.

pH

The Idaho WQS at IDAPA 58.01.02.250.01.a, require pH values of the receiving water to be within the range of 6.5 to 9.0. 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. Effluent pH data were compared to the water quality criteria. A review of the facility's effluent pH data showed no exceedances of the pH standard.

E. coli

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

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

Regulations at 40 CFR 122.45(d)(2) require that effluent limitations for continuous discharges from POTWs be expressed as average monthly and average weekly limits, unless impracticable. Additionally, the terms "average monthly limit" and "average weekly limit" are defined in 40 CFR 122.2 as being arithmetic (as opposed to geometric) averages. It is impracticable to properly implement a 30-day geometric mean criterion in a permit using monthly and weekly arithmetic average limits. The geometric mean of a given data set is equal to the arithmetic mean of that data set if and only if all of the values in that data set are equal. Otherwise, the geometric mean is always less than the arithmetic mean. In order to ensure that the effluent limits are "derived from and comply with" the geometric mean water quality criterion, as required by 40 CFR 122.44(d)(1)(vii)(A), it is necessary to express the effluent limits as a monthly geometric mean and an instantaneous maximum limit.

Chlorine

The Idaho state WQS at IDAPA 58.01.02.210 establish an acute criterion of 19 µg/L and a chronic criterion of 11 µg/L for the protection of aquatic life. A reasonable potential calculation showed that the discharge from the facility would have the reasonable potential to cause or contribute to a violation of the water quality criterion (WQC) for chlorine. Therefore, the draft permit contains a WQBEL for chlorine. See Appendix C for reasonable potential and effluent limit calculations for chlorine.

Floating, Suspended and Submerged Matter/Oil and Grease

The Idaho water quality standards require that surface waters of the State be free from floating, suspended or submerged matter of any kind in concentrations impairing designated beneficial uses. The draft permit contains a narrative limitation prohibiting the discharge of such materials.

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 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. Idaho's water quality standards define a "zone of initial dilution" as "an area

within a...mixing zone where acute criteria may be exceeded" (IDAPA 58.01.02.010.118). All water quality criteria must be met at the edge of the mixing zone (IDAPA 58.01.02.060.01.b).

The facility has been granted a zone of initial dilution encompassing 21% of the 1Q10 stream flow and a mixing zone encompassing 25% of the 30Q5 stream flow for ammonia, and a zone of initial dilution and mixing zone encompassing 25% of the 1Q10 and 7Q10 stream flows, respectively, for chlorine.

Procedure for Deriving Water Quality-Based Effluent Limits

The first step in developing a water quality-based effluent limit is to develop a 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 WQS in the receiving water. In cases where a mixing zone is not authorized, 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. Once a WLA is developed, EPA calculates effluent limits which are protective of the WLA using statistical procedures described in Appendix C, which details the specific WQBELs in the draft permit.

Appendix C – Reasonable Potential and Water Quality-based Effluent Limits

A. Ammonia

Per IDAPA 58.01.02.250.02.d, ammonia criteria were calculated using the following equations and using the 95th percentile pH (7.5) and temperature (16.95 °C).

$$CMC = \frac{0.275}{1+10^{7.204-pH}} + \frac{39.0}{1+10^{pH-7.204}}$$

Equation 1. Calculation for ammonia criteria (acute).

$$CMC = \frac{0.275}{1+10^{7.204-7.5}} + \frac{39.0}{1+10^{7.5-7.204}}$$

$$CMC = 13.28 \text{ mg/L}$$

Equation 2. Calculation for ammonia criteria (chronic, early life stages present).

$$CCC = \left(\frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}}\right) x\ MIN\ (2.85, 1.45x10^{0.028x(25-T)})$$

$$CCC = \left(\frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}}\right) x\ MIN\ (2.85, 1.45x10^{0.028x(25-T)})$$

$$CCC = \left(\frac{0.0577}{1+10^{7.688-7.5}} + \frac{2.487}{1+10^{7.5-7.688}}\right) x\ MIN\ (2.85, 1.45x10^{0.028x(25-16.95)})$$

$$CCC = 3.73 \text{ mg/L}$$

To calculate reasonable potential, the receiving water concentration downstream of the effluent discharge is calculated and compared to the criteria above:

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

Equation 3. Simple mass-balance equation.

where,

C_d = downstream receiving water concentration	Calculated value
Q_e = critical effluent flow	Design flow in cubic feet per second (cfs)
Q_u = critical upstream flow	From WQS
%MZ = percent of critical low flow provided by mixing zone	From mixing zone analysis
C_u = critical upstream pollutant concentration	From receiving water data
C_e = critical effluent pollutant concentration	Calculated value

To calculate C_e acute, there must be a maximum observed effluent concentration (MOEC) and reasonable potential multiplying factor (RPMF). The MOEC for ammonia is 15.9 mg/L.

To calculate the RPMF:

$$RPMF = \frac{C_{99}}{C_{p_n}} = \frac{e^{(z_{99} \times \sigma - 0.5 \times \sigma^2)}}{e^{(z_{p_n} \times \sigma - 0.5 \times \sigma^2)}}$$

Equation 4. RPMF calculation using z-scores

where,

Z_{99} = z score of the 99th percentile of the normal distribution	2.326
$p_n = (1 - Confidence\ Level)^{1/N}$, 99% confidence	0.873
Z_{pn} = z score of the normal distribution corresponding to the "N" samples	1.126
n = number of samples	30
σ = square root of σ^2	0.874
$\sigma^2 = \ln(CV^2+1)$	$\ln(CV^2+1) = \text{Ln}\ (1.07^2+1) = 0.763$
CV = standard deviation / mean, (4.095 / 3.842)	1.07

1. Pierce's dataset provided 34 samples with an average of 3.842 and a standard deviation of 4.095

$$RPMF = \frac{C_{99}}{C_{p_n}} = \frac{e^{(z_{99} \times \sigma - 0.5 \times \sigma^2)}}{e^{(z_{p_n} \times \sigma - 0.5 \times \sigma^2)}}$$

$$RPMF = \frac{e^{(2.326)(0.874) - (0.5)(0.763)}}{e^{(1.126)(0.874) - (0.5)(0.763)}}$$

$$RPMF = \frac{5.214}{1.827} = 2.854$$

This RPMF is then used to calculate the C_e using Equation 5:

$$C_e = MOEC\ x\ RPMF$$

Equation 5. Calculation of critical effluent concentration.

$$C_e = 15.9\ mg/L\ x\ 2.854 = 45.38\ \text{mg/L}$$

Using the C_e calculated in Equation 5 and using the simple mass-balance equation (Equation 3) to calculate C_d acute:

$$C_d = \frac{\left(45.38\ \frac{mg}{L} \times 0.46\ cfs\right) + \left|1\frac{mg}{L}(5.9\ cfs \times 0)\right|}{0.46\ cfs + (5.9\ cfs \times 0)}$$

$$C_d = 45.38\ \frac{mg}{L}$$

This equation uses the 1Q10 flow of 5.9 cfs. The calculated C_d at 0% mixing is greater than the acute criterion for ammonia.

The zone of initial dilution size was adjusted until RPTE was no longer demonstrated. This value was 21%. The resulting C_d of 13.02 mg/L is less than the CMC of 13.28 mg/L.

$$C_d = \frac{\left(45.38\ \frac{mg}{L} \times 0.46\ cfs\right) + \left\lfloor 1\frac{mg}{L}(5.9\ cfs \times 0.21)\right\rfloor}{0.46\ cfs + (5.9\ cfs \times 0.21)}$$

$$C_d = 13.02\ \frac{mg}{L}$$

Using the C_e calculated in Equation 5 and using the simple mass-balance equation (Equation 3) to calculate C_d chronic:

$$C_d = \frac{(45.38\ mg/L \times 0.46\ cfs) + \left\lfloor 1\frac{mg}{L}(9.57\ cfs \times 0)\right\rfloor}{0.46\ cfs + (9.57\ cfs \times 0)}$$

$$C_d = 45.38\ mg/L$$

This equation uses the 30Q5 flow of 9.57 cfs. The calculated C_d at 0% mixing is greater than the chronic criterion for ammonia.

The mixing zone size was adjusted up to 25%, and the resulting C_d of 8.16 mg/L was greater than the CCC of 3.73 mg/L. Therefore, there is RPTE and a limit is needed.

$$C_d = \frac{(45.38\ mg/L \times 0.46\ cfs) + \left\lfloor 1\frac{mg}{L}(9.57\ cfs \times 0.25)\right\rfloor}{0.46\ cfs + (9.57\ cfs \times 0.25)}$$

$$C_d = 8.16\ mg/L$$

Calculate the WLA for Ammonia

$$C_e = WLA_{(a\ or\ c)} = \frac{WQC_{(a\ or\ c)}[Q_e + (Q_u \times \%MZ)] - [C_u \times (Q_u \times \%MZ)]}{Q_e}$$

Equation 6. Simple mass-balance equation for calculating WLA

Using Equation 6 to calculate the acute WLA:

$$WLA_a = \frac{13.28\frac{mg}{L}\ [0.46\ cfs + (5.9\ cfs \times 0.21)] - [1.0\frac{mg}{L} \times (5.9 \times 0.21)]}{0.46\ cfs}$$

$WLA_a = 46.36$ mg/L

Using Equation 6 to calculate the chronic WLA:

$$WLA_{(c)} = \frac{3.73\frac{mg}{L}\,[0.46\,cfs + (9.57\,cfs \times 0.25)] - [1.0\frac{mg}{L} \times (9.57 \times 0.25)}{0.46\,cfs}$$

WLA_c = 17.93 mg/L

Calculate the Chronic Long-term Average for Ammonia

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

For ammonia, because the chronic criterion is based on a 30-day averaging period, the chronic LTA is calculated as follows:

$$LTA_c = WLA_c \times e^{(0.5\sigma_{30}^2 - z\sigma_{30})}$$ **Equation 7. Calculation of chronic LTA**

$$LTA_c = 17.93\ mg/L \times e^{(0.5)(0.037) - (2.326)(0.194)} = 11.63\ mg/L$$

where,

σ_{30} = 0.194
σ_{30}^2 = $\ln(CV^2/30 + 1)$ = 0.037
Z = 2.326 (z-score for the 99th percentile probability basis)
CV = 1.07 (StdDev 4.095, avg 3.842)

To calculate the acute LTA:

$$LTA_a = WLA_a \times e^{(0.5\sigma^2 - z\sigma)}$$ **Equation 8. Calculation of actue LTA**

$$LTA_a = 46.36\ mg/L \times e^{((0.5)(0.763) - (2.326)(0.874))} = 8.89\ mg/L$$

where,

σ = 0.874
σ^2 = $\ln(CV^2 + 1)$ = 0.763
Z = 2.326 (z-score for the 99th percentile probability basis)
CV = 1.07 (StdDev 4.095, avg 3.842)

The LTAs are compared and the more stringent is used to develop the daily maximum and monthly average permit limits. In this case, the acute limit of 8.89 mg/L is used to calculate the MDL and AML.

Derive the maximum daily and average monthly effluent limits

Using the TSD equations, the maximum daily limit (MDL) and average monthly limit (AML) effluent limits are calculated as follows:

$$MDL = LTA \times e^{(z_m\sigma - 0.5\sigma^2)}$$

Equation 9. Calculating MDL from LTA

$$MDL = 8.89 \text{ mg/L} \times e^{(2.326)(0.874) - (0.5)(0.763)} = 46 \text{ mg/L}$$

where,

σ = 0.874
σ^2 = $\ln(CV^2 + 1) = 0.763$
z_m = 2.326 (z-score for the 99th percentile probability basis)
z_a = 1.645 (z-score for the 95th percentile probability basis)

$$AML = LTA \times e^{(z_a\sigma_n - 0.5\sigma_n^2)}$$

Equation 10. Calculating AML from LTA

$$AML = 8.89 \text{ mg/L} \times e^{(1.645)(0.502) - (0.5)(0.252)} = 17.8 \text{ mg/L}$$

where,

σ_n = 0.502
σ_n^2 = $\ln(CV^2/n + 1) = 0.252$
z_a = 1.645 (z-score for the 95th percentile probability basis)
n = 4, number of sampling events required per month

A mixing zone of 25% and a zone of initial dilution of 21% are authorized for ammonia.

B. Chlorine

IDAPA 58.01.02.210 defines Idaho's WQS for chlorine as:

Aquatic Life Criteria, acute	19 µg/L
Aquatic Life Criteria, chronic	11 µg/L

Pierce's dataset provided 500 chlorine samples with a CV of 1.74.

Using Equation 5 where

Z_{99} = z score of the 99th percentile of the normal distribution	2.326
$p_n = (1 - Confidence\ Level)^{1/N}$, 99%	0.991
Z_{pn} = z score of the normal distribution corresponding to the "N" samples in the dataset	2.326

σ = square root of σ^2	1.180
σ^2 = Ln(CV^2+1)	1.393
CV = standard deviation / mean, (0.346 / 0.199)	1.74

$$RPMF = \frac{C_{99}}{C_{p_n}} = \frac{e^{(z_{99}\times\sigma-0.5\times\sigma^2)}}{e^{(z_{p_n}\times\sigma-0.5\times\sigma^2)}}$$

$$RPMF = \frac{e^{(2.326)(1.180)-(0.5)(1.393)}}{e^{(2.236)(1.180)-(0.5)(1.393)}}$$

$$RPMF = \frac{7.754}{7.754} = 1.0$$

MOEC = 4 mg/L = 4,000 µg/L

$$C_e = 4{,}000\ \mu g/L\ x\ 1.0 = 4{,}000\ \mu g/L$$

The RMPF of 1.0 is derived from the 99% confidence level, 99% probability basis in the TSD.

Using the C_e calculated in Equation 5 and using the simple mass-balance equation (Equation 3) to calculate C_d acute:

$$C_d = \frac{(4{,}000\frac{\mu g}{L}\times 0.46\ cfs) + [1.0\ \mu g/L\ (5.9\ cfs\times 0)]}{0.46\ cfs + (5.9\ cfs\times 0)}$$

$$C_d = 4{,}000\ \mu g/L$$

This equation uses the 1Q10 of 5.9 cfs. The calculated downstream concentration is greater than the acute criterion of 19 µg/L. Therefore, RPTE is demonstrated and a limit is required.

The mixing zone size was adjusted up to 25%, and the resulting C_d of 951.67 µg/L was greater than the acute criterion.

$$C_d = \frac{(4{,}000\frac{\mu g}{L}\times 0.46\ cfs) + [1.0\ \mu g/L\ (5.9\ cfs\times 0.25)]}{0.46\ cfs + (5.9\ cfs\times 0.25)}$$

$$C_d = 951.67\ \mu g/L$$

Using the C_e calculated in Equation 5 and using the simple mass-balance equation (Equation 3) to calculate C_d chronic:

$$C_d = \frac{(4{,}000\frac{\mu g}{L}\times 0.46\ cfs) + [1.0\ \mu g/L\ (7.0\ cfs\times 0)]}{0.46\ cfs + (7.0\ cfs\times 0)}$$

$$C_d = 4{,}000\ \mu g/L$$

This equation uses the 7Q10 of 7.0 cfs. The calculated downstream concentration is greater than the chronic water quality criterion of 11 µg/L. Therefore, RPTE is demonstrated and a limit is required.

The mixing zone size was adjusted up to 25%, and the calculated C_d of 833.37 µg/L was greater than the chronic criterion.

$$C_d = \frac{(4{,}000\,\frac{\mu g}{L} \times 0.46\ cfs) + [1.0\ \mu g/L\ (7.0\ cfs \times 0.25)]}{0.46\ cfs + (7.0\ cfs \times 0.25)}$$

$$C_d = 833.37\ \mu g/L$$

Calculate the WLA for Chlorine

Using Equation 6 to calculate the acute WLA:

$$WLA_{(a)} = \frac{19\,\frac{\mu g}{L}[0.46\ cfs + (5.9\ cfs \times 0.25)] - [0 \times (5.9\ cfs \times 0.25)]}{0.46\ cfs}$$

$WLA_a = 79.92\ \mu g/L$

Using Equation 10 to calculate the chronic WLA:

$$WLA_{(c)} = \frac{11\,\frac{\mu g}{L}[0.46\ cfs + (7.0\ cfs \times 0.25)] - [0 \times (7.0\ cfs \times 0.25)]}{0.46\ cfs}$$

$WLA_c = 52.85\ \mu g/L$

Calculate the LTA for Chlorine

Using Equation 8 to calculate the acute LTA:

$$LTA_a = WLA_a \times e^{(0.5\sigma^2 - z\,\sigma)}$$

$$LTA_a = 79.92\ \mu g/L \times e^{(0.5)(1.393) - (2.326)(1.180)} = 10.31\ \mu g/L$$

where,

σ = square root of σ^2	1.180
$\sigma^2 = \ln(CV^2+1)$	1.393
Z_{99} = z score of the 99th percentile of the normal distribution	2.326
CV = coefficient of variation	1.74

Using Equation 11 to calculate the chronic LTA:

$$LTA_c = WLA_c \times e^{(0.5\sigma_4^2 - z_{99}\sigma_4)}$$

Equation 11. Calculation of chronic LTA for toxics

$$LTA_c = 52.85\ \mu g/L \times e^{(0.5)(0.564)-(2.326)(0.751)} = 12.21\ \mu g/L$$

where,

σ_4 = square root of σ_4^2	0.751
$\sigma_4^2 = Ln[(CV^2)/4 + 1)]$	0.564
CV = Coefficient of Variation	1.74
Z_{99} = z score of the 99th percentile of the normal distribution	2.326

The LTAs are compared and the more stringent is used to develop the daily maximum and monthly average permit limits.

Derive the maximum daily and average monthly effluent limits

Using Equation 9 and Equation 10, the MDL and AML effluent limits are calculated using the most stringent LTA (in this case, the acute LTA of 10.31 µg/L).

$$MDL = 10.31\ \mu g/L \times e^{(2.326)(1.180)-(0.5)(1.393))} = 80\ \mu g/L$$

$$AML = 10.31\ \mu g/L \times e^{(1.645)(0.751)-(0.5)(0.564))} = 27\ \mu g/L$$

Where,

z_a	=	1.645 (z-score for the 95th percentile probability basis)
z_m	=	2.326 (z-score for the 99th percentile probability basis)
n	=	4, number of sampling events required per month
σ	=	1.180
σ^2	=	$Ln(CV^2+1) = Ln(1.74^2+1) = 1.393$
σ_4	=	0.751
σ_4^2	=	0.564

C. References

EPA. 1991. Technical Support Document for Water Quality-based Toxics Control. US Environmental Protection Agency, Office of Water, EPA/505/2-90-001. https://www3.epa.gov/npdes/pubs/owm0264.pdf

Appendix D – Endangered Species Act

A. Overview

As discussed in Section VIII of this fact sheet, Section 7 of the Endangered Species Act requires federal agencies to consult with the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) if there are potential affects a federal action may have on threatened and endangered species. EPA has determined that there is no effect to threatened and endangered species resulting from discharge from the Pierce WWTF.

B. Species Lists

USFWS Species and Critical Habitat

On September 12, 2017, the EPA obtained an official species list from the U.S. Fish and Wildlife Service, using its ECOS-IPaC website. According to the official species list, there are no listed threatened or endangered species under USFWS jurisdiction occurring in the vicinity of the Pierce WWTF. However, the North American wolverine (*Gulo gulo luscus*), which is a proposed threatened species, does occur in the vicinity of the Pierce WWTF. Since this species has not yet been listed, and since it is not an aquatic species and therefore has no exposure pathway for pollutants discharged by the Pierce WWTF, this species is not addressed further.

The letter providing the species list cautions that "the IPaC module for producing a list of proposed and designated critical habitat is currently incomplete," and thus asks that the action agency check the USFWS website to determine if the action area includes critical habitat. The only USFWS species with designated critical habitat in Clearwater County, Idaho is bull trout. The Clearwater River, which is downstream from Orofino Creek, is designated bull trout critical habitat, but Orofino Creek is not designated bull trout critical habitat.

NOAA NMFS Species and Critical Habitat

Orofino Creek may be used by Snake River fall Chinook salmon, Snake River Spring/Summer Chinook salmon, Snake River sockeye salmon, and Snake River steelhead.

The lower part of Orofino Creek, below 46.485° north latitude and 116.196° west longitude, is designated critical habitat for snake river steelhead (70 FR 52781). The Clearwater River is designated critical habitat for Snake River Fall Chinook salmon (58 FR 68543).

C. Potential Impacts from the Discharge on Listed Species

The following sections present general and chemical specific impacts to the listed aquatic species.

General Discussion

Snake River fall Chinook salmon, Snake River Spring/Summer Chinook salmon, Snake River sockeye salmon, and Snake River steelhead can be found in the Clearwater River. These species may also be present in Orofino Creek, a tributary to the Clearwater River, which is the receiving water for the NPDES permittee addressed by this BE.

The NMFS' assessment of impacts to fall Chinook salmon and steelhead in the Columbia River basin largely focuses on impacts from major dam operations. Other sources of effects include

hatcheries and habitat effects from large-scale land disturbance. Impacts from small municipal wastewater dischargers are not identified. The recovery plans reference the need to complete Total Maximum Daily Loads (TMDLs) to address water quality concerns in critical habitat areas. However, Orofino Creek has not been listed as impaired, i.e., no TMDL is needed.

Chemical-specific Effects

The following subsections describe the characteristics of the permitted discharge from the Pierce WWTF and their potential effects on listed species. EPA is not aware of any influent sources of other toxic pollutants (e.g., metals and organic pollutants) to the treatment plant. Overall, Orofino Creek in the vicinity of the discharge is not listed as water quality impaired for any parameters. Since reissuance of the permit will not change the current discharge, it is generally unlikely to cause degradation in water quality and associated impacts on listed species.

Total Suspended Solids (TSS)

The Idaho Administrative Procedures Act (IDAPA) Section 58.01.02.200.08 provides a narrative water quality standard for sediment. Sediment shall not exceed quantities specified in Section 250, or in the absence of specific sediment criteria, quantities that impair designated beneficial uses. Other sources provide appropriate numeric limits and targets for suspended sediment. Suggested limits for suspended sediment have been developed by the European Inland Fisheries Advisory Commission and the National Academy of Sciences, and have been adopted by the State of Idaho in previous TMDLs. A limit of 25 mg/L of suspended sediment provides a high level of protection of aquatic organisms; 80 mg/L moderate protection; 400 mg/L low protection; and over 400 mg/L very low protection (USDA FS 1990, Thurston et al. 1979).

Suspended solids from the City's wastewater discharges are highly unlikely to pose any risk or harm to aquatic life, including threatened or endangered salmonids in the region, because the effluent dilution is high (typically more than 16:1). With the effluent limits of 30 mg/L (monthly average) and 45 mg/L (maximum weekly average), the large amount of receiving stream flow will dilute and disperse any suspended solids resulting in an extremely low concentration at any point in the stream. This concentration of TSS will be indistinguishable from natural background concentrations and harmless to aquatic life.

Chlorine

Chlorine has been shown to cause avoidance responses in fish (Heath 1995). In freshwater, residual chlorine is composed of both "free" chlorine (made up of hypochlorous acid and hypochlorite ions) and combined chlorine (primarily made up of monochloramine). Free chlorine is more toxic than the combined form, and fish avoid it at lower concentrations (Cherry et al., 1979). Both marine and freshwater fish species have been shown to avoid chlorine at concentrations well below the lethal level (but it is important to understand that temperature, body size, and time of exposure can influence the organism's response). Wastewater treatment plants effluents may contain chlorine and also have waste heat. This combination of a contaminant that is avoided by fish (at sub-lethal levels) and elevated water temperature, would elicit an avoidance response in the salmonid species of concern considered in this Biological Evaluation.

To minimize the potential effects on desirable species of aquatic life from chlorine discharge into receiving waters, EPA (1986) established criteria for chlorine at 11 ug/L as a 4-day average and

19 ug/L as a 1-hour average. Idaho applies its water quality standard, equivalent to that established by EPA (1986), for residual chlorine to all waters throughout the state for the protection of aquatic life. The permit includes total residual chlorine limits based on application of the above water quality standards with a mixing zone that takes into account the allowed 25 percent of the stream flow. This will ensure protection of downstream water quality. In addition:

1. Chlorine dissipates very quickly (within minutes) and does not bioaccumulate or cause chronic toxicity problems.
2. Potential acute effects of chlorine are extremely low because of the dilution that occurs when effluents are discharged to relatively large receiving streams. With the very quick dissipation of chlorine and the dilution in the receiving stream, only a very small area near the discharge point would have even marginally toxic concentrations of chlorine at any given time.
3. Fish such as salmonids are adept at sensing and avoiding very low (subacute) concentrations of chlorine. Thus, even if there was a small area of relatively higher chlorine concentration near the discharge point in the river, fish would easily avoid the area.

Ammonia

Ammonia concentrations in the City's discharge are very unlikely to cause any harm, directly or indirectly, to threatened or endangered aquatic species for the following reasons:

1. Ammonia toxicity is related to the unionized fraction, which is greater as pH and temperature increase. Ammonia limits are based on critical conditions for both pH and temperature, in addition to stream flow. Thus, in general, the unionized fraction of ammonia would be relatively low (i.e., most of the ammonia is in an ionized or non-toxic state), relative to the critical conditions used to derive the limits. Therefore, ammonia is not likely to cause toxicity.
2. The concentration of ammonia at any point in the river will be low given the dilution experienced by the effluent. The dilution would also negate any potentially higher effluent pH on ammonia toxicity; ammonia speciation and toxicity will be driven by the stream pH rather than the effluent pH because stream flow is so much greater.
3. Fish, such as the listed species, are adept at sensing and avoiding very low concentrations of ammonia. Thus, even if there was a small area of higher ammonia concentration, fish could easily avoid it. In addition, fish have been reported to have the ability to enter waters that contain acutely toxic concentrations of ammonia without suffering any obvious long-term effects, as long as the trips are followed by periods in which the fish are in waters that contain ammonia concentrations below acute toxicity levels (Thurston et al. 1981). The low ammonia concentrations in the effluent vicinity and the extremely small effected area, if any, would not impact these fish populations because critical habitat would not be affected in any measurable way.
4. Indirect effects of ammonia, such as nutrient enrichment for primary producers, would also be insignificant because of the dilution of the effluent.

Bacteria

Effluent limitations for E. coli will ensure that bacterial levels will be extremely low in the discharge and receiving water. Furthermore, bacteria from domestic waste that might be present in the effluent is unlikely to cause harm to aquatic life because these are not aquatic pathogens.

pH

In 1969, the European Inland fisheries Advisory Commission (EIFAC) concluded that pH values ranging from 5.0 to 6.0 are unlikely to harm any species unless either the concentration of free carbon dioxide exceeds 20 parts per million (ppm) or the water contains iron salts precipitated as ferric hydroxide, a compound of unknown toxicity. pH values ranging from 6.0 to 6.5 are unlikely to harm fish unless free carbon dioxide is present in excess of 100 ppm, while pH values ranging from 6.5 to 9.0 are harmless to fish, although the toxicity of other compounds may be affected by changes within this range. These and other studies evaluating the effects of pH on various fish species and macroinvertebrates led EPA (1986) to conclude that a pH range of 6.5 to 9.0 appears to provide adequate protection for the life of freshwater fish and bottom dwelling invertebrates. The permit requires compliance with a pH limit of 6.5-9.0 at the point of discharge, which is Idaho's water quality standard for aquatic life. Therefore, issuance of the NPDES permit will not cause pH-related effects on listed species.

BOD/Dissolved Oxygen

The BOD limits of 30 mg/L (monthly average) and 45 mg/L (maximum weekly average) should be fully protective of listed species, given that the stream is not impaired for dissolved oxygen and the dilution available. The dilution would result in little, if any, area where BOD may be slightly higher than background. The slight, if any, increase in BOD at the discharge point would not have a measurable on dissolved oxygen levels and fish populations. furthermore, the relatively cool water temperature of these streams typically results in high oxygen saturation and therefore, adequate oxygen for fish and other aquatic life.

Temperature

The affected segment of Orofino Creek is not listed as impaired for temperature. Much like ammonia and the other parameters discussed above, the prevailing temperature conditions near the discharge point will be driven overwhelmingly by the ambient stream conditions because the effluent is such a small proportion of the total flow. Therefore, temperature effects of the effluent, if any, will be limited to such a small area as to be insignificant in terms of fish population survival, reproduction, and growth.

Critical Habitat

The Clearwater River is designated critical habitat for bull trout and Snake River fall Chinook salmon. Both the lower part of Orofino Creek as well as the Clearwater River are designated critical habitat for Snake River Steelhead. The discharge is not expected to have any effect upon lower Orofino Creek or the Clearwater River. The linear distance from the Pierce WWTF to the segment of Orofino Creek which is designated critical habitat for Snake River Steelhead is 29 miles; the distance in stream miles would be farther. The minimum flow of Orofino Creek at the USGS station above Whiskey Creek (station #13339800) which is in the segment of Orofino Creek which is designated critical habitat for Snake River steelhead, is 27 CFS. The design flow of the Pierce WWTF is 0.46 CFS, which is less than 2% of the minimum flow in Orofino Creek.

Thus, the discharge from the Pierce WWTF will be so dilute that it will have no effect on critical habitat in lower Orofino Creek or the Clearwater River downstream from Orofino Creek.

D. Conclusion

The evaluation concludes that the action of permit issuance for the Pierce WWTF in the Clearwater River Subbasin will not affect any of the listed threatened and endangered species.

E. References

Cherry, D.S., S.R. Larrick, J.D. Giattina, K.L Dickson and J. Cairns. 1979. Avoidance and toxicity response of fish to intermittent chlorination. Environ. Intern. 2:1. http://www.sciencedirect.com/science/article/pii/0160412079900461

Heath, A.G. 1995. Water Pollution and fish Physiology: Second Edition. Lewis Publishers, Boca Raton, FL.

Thurston R.V., R.C. Russo, C.M. Fefteroif, T.A. Edsall, Y.M. Barber Jr., editors. 1979. Review of the EPA Red Book: Quality Criteria for Water. Bethesda, MD. Water Quality Section, American Fisheries.

Thurston, R.V., C. Chakoumakos, and R.C. Russo. 1981. Effect of fluctuating exposures on the acute toxicity of ammonia to rainbow trout (Salmo gairdneri) and cutthroat trout (S. clarid). Water Research 15:911-917. http://www.sciencedirect.com/science/article/pii/0043135481901470

U.S. Department of Agriculture Forest Service (USDA FS). 1990. Salmonid-habitat Relationships in the Western United States: A Review and Indexed Bibliography. USDA forest Service. General Technical Report RM-188. Fort Collins, CO. Rocky Mountain Forest and Range Experiment Station, USDA FS.

U.S. Environmental Protection Agency (EPA). 1986. Quality Criteria for Water. EPA 440/5-86-001. USEPA, Office of Water, Regulations and Standards, Washington, DC. https://nepis.epa.gov/Exe/ZyPDF.cgi/00001MGA.PDF?Dockey=00001MGA.PDF

Appendix E – Essential Fish Habitat Assessment

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

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

A. Listing of EFH Species in the Facility Area

All waterbodies used by anadromous salmon throughout Idaho must be considered for EFH identification. The receiving water may be used by Snake River fall Chinook salmon, Snake River Spring/Summer Chinook salmon, Snake River sockeye salmon, and Snake River steelhead.

B. Description of the Facility and Discharge Location

The activities and sources of wastewater at the Pierce WWTF are described in detail in Part II and Appendix A of this fact sheet. The location of the outfall is described in Part III ("Receiving Water").

C. The EPA's Evaluation of Potential Effects to EFH

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

Effluent Characterization

Characterization of the Pierce WWTF effluent was accomplished using a variety of sources, including:

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

Identification of Pollutants of Concern and Threshold Concentrations

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

Exposure and Wasteload Allocation

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

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

- Consideration of multiple sources and background concentrations

Statistical Evaluation for Permit Limit Development

Calculation of permit limits using statistical procedures addressing the following:

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

Monitoring Programs

Development of monitoring requirements, including:

- Compliance monitoring of the effluent
- Ambient monitoring

Protection of Aquatic Life in NPDES Permitting

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

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

Effects Determination

Since the proposed permit has been developed to protect aquatic life species in the receiving water in accordance with the Idaho water quality standards, the EPA has determined that issuance of this permit is not likely to adversely affect any EFH in the vicinity of the discharge. The EPA will provide NMFS with copies of the draft permit and fact sheet during the public notice period. Any recommendations received from NMFS regarding EFH will be considered prior to reissuance of this permit.

Appendix F – Draft Clean Water Act Section 401 Certification

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1118 F Street • Lewiston, Idaho 83501 • (208) 799-4370
www.deq.idaho.gov

C.L. "Butch" Otter, Governor
John H. Tippets, Director

October 17, 2017

Mr. Michael J. Lidgard
NPDES Permits Unit Manager
EPA Region 10
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101-3140

Subject: DRAFT 401 Water Quality Certification for the City of Pierce Wastewater Treatment Facility, Permit #ID0020206

Dear Mr. Lidgard:

The Lewiston Regional Office of the Department of Environmental Quality (DEQ) has reviewed the above-referenced permit for the City of Pierce Wastewater Treatment Facility. Section 401 of the Clean Water Act requires that states issue certifications for activities which are authorized by a federal permit and which may result in the discharge to surface waters. In Idaho, the DEQ is responsible for reviewing these activities and evaluating whether the activity will comply with Idaho's Water Quality Standards, including any applicable water quality management plans (e.g., total maximum daily loads). A federal discharge permit cannot be issued until DEQ has provided certification or waived certification either expressively, or by taking no action.

This letter is to inform you that DEQ is issuing the attached 401 certification subject to the terms and conditions contained therein.

Please contact me directly at (208) 799-4370 to discuss any questions or concerns regarding the content of this certification.

Sincerely,

John Cardwell
Regional Administrator
Lewiston Regional Office

ec: Brian Nickel, EPA Region 10
Don Essig, DEQ State Office
Mark Cecchini-Beaver, Deputy AG
TRIM

Idaho Department of Environmental Quality

Draft §401 Water Quality Certification

October 17, 2017

NPDES Permit Number(s): City of Pierce Wastewater Treatment Facility, Permit #ID0020206

Receiving Water Body: Orofino Creek

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

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

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

Antidegradation Review

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

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

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

Pollutants of Concern

The City of Pierce WWTF discharges the following pollutants of concern: five-day biological oxygen demand (BOD_5), total suspended solids (TSS), *E. coli*, pH, ammonia, and total residual chlorine (TRC). Effluent limits have been developed for BOD_5, TSS, *E. coli*, pH, ammonia, and total residual chlorine (TRC).

Receiving Water Body Level of Protection

The City of Pierce WWTF discharges to Orofino Creek within the Clearwater Subbasin assessment unit (AU) ID17060306CL039_04 (Orofino Creek – source to mouth). This AU has the following designated beneficial uses: cold water aquatic life, primary contact recreation, and salmonid spawning. In addition to these uses, all waters of the state are protected for agricultural and industrial water supply, wildlife habitat, and aesthetics (IDAPA 58.01.02.100).

According to DEQ's 2014 Integrated Report, this receiving water body AU is fully supporting its assessed uses (IDAPA 58.01.02.052.05.a). As such, DEQ will provide Tier II protection in addition to Tier I for this water body (IDAPA 58.01.02.051.02; 58.01.02.051.01).

Protection and Maintenance of Existing Uses (Tier I Protection)

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

High-Quality Waters (Tier II Protection)

Orofino Creek is considered high quality for cold water aquatic life, primary contact recreation, and salmonid spawning. As such, the water quality relevant to cold water aquatic life, primary contact recreation, and salmonid spawning uses of Orofino Creek must be maintained and protected, unless a lowering of water quality is deemed necessary to accommodate important social or economic development.

To determine whether degradation will occur, DEQ must evaluate how the permit issuance will affect water quality for each pollutant that is relevant to cold water aquatic life, primary contact recreation, and salmonid spawning uses of the Orofino Creek (IDAPA 58.01.02.052.05). These include the following: BOD_5, TSS, *E. coli*, pH, ammonia, and TRC. Effluent limits are set in the proposed permit for all these pollutants.

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

Pollutants with Limits in the Current and Proposed Permit

For pollutants that are currently limited and will have limits under the reissued permit, the current discharge quality is based on the limits in the current permit or license (IDAPA 58.01.02.052.06.a.i), and the future discharge quality is based on the proposed permit limits (IDAPA 58.01.02.052.06.a.ii). For the City of Pierce WWTF permit, this means determining the permit's effect on water quality based upon the limits for BOD_5, TSS, *E. coli*, pH, and total residual chlorine in the current and proposed permits. Table 1 provides a summary of the current permit limits and the proposed permit limits.

Table 1. Comparison of current and proposed permit limits for pollutants of concern relevant to uses receiving Tier II protection.

Pollutant	Units	Current Permit			Proposed Permit			Change[a]
		Average Monthly Limit	Average Weekly Limit	Single Sample Limit	Average Monthly Limit	Average Weekly Limit	Single Sample Limit	
Pollutants with limits in both the current and proposed permit								
Biochemical Oxygen Demand (BOD_5)	mg/L	30	45	—	30	45	—	NC
	lb/day	75	113	—	75	113	—	
	% removal	—	—	—	85%	—	—	
TSS	mg/L	30	45	—	30	45	—	NC
	lb/day	75	113	—	75	113	—	
	% removal	—	—	—	85%	—	—	
pH	standard units	6.5–9.0 all times			6.5–9.0 all times			NC
E. coli	no./100 mL	126	—	406	126		406	NC
Total Residual Chlorine	µg/L	40	—	100	27	—	80	D
	lb/day	0.1	—	0.3	0.07	—	0.20	
Pollutants with new limits in the proposed permit								
Total Ammonia (as N)	mg/L	—	—	Report	17.8	—	46	New
	lb/day	—	—	—	44.5	—	115	
Report Parameters								
Flow	mgd	—	—	Report	—	—	Report	NC
Temperature	°C	—	—	Report	—	—	Report	NC

[a] NC = no change, I = increase, D = decrease.

The proposed permit limits for other pollutants of concern that have limits in Table 1, BOD_5, TSS, *E. coli*, pH, and total residual chlorine, are the same as, or more stringent than, those in the

current permit ("NC" or "D" in change column). Therefore, no adverse change in water quality and no degradation will result from the discharge of these pollutants.

New Permit Limits for Pollutants Currently Discharged

When new limits are proposed in a reissued permit for pollutants in the existing discharge, the effect on water quality is based upon the current discharge quality and the proposed discharge quality resulting from the new limits. Current discharge quality for pollutants that are not currently limited is based upon available discharge quality data (IDAPA 58.01.02.052.06.a.i). Future discharge quality is based upon proposed permit limits (IDAPA 58.01.02.052.06.a.ii).

The proposed permit for City of Pierce WWTF includes new limits for Total Ammonia (as N) (Table 1). Ammonia criteria in the proposed permit were calculated using the equations found in IDAPA 58.01.02.250.02.d using the 95th percentile pH (7.5) and temperature (16.95 °C). An acute WLA was developed using the maximum concentration ammonia criterion, the 1Q10 flow of 5.9 cfs, and a zone of initial dilution of 21%. A chronic WLA was developed using the continuous concentration ammonia criterion, the 30Q5 flow of 9.57 cfs, and a mixing zone of 25%. These limits were included in the permit to be consistent with Idaho water quality standards pertinent to cold water aquatic life uses (IDAPA 58.01.02.250.02.d). The total ammonia water quality based effluent limits in the proposed permit reflect a maintenance or improvement in water quality from current conditions. Therefore, no adverse change in water quality and no degradation will occur with respect to this pollutant.

Pollutants with No Limits

There are no pollutants of concern without effluent limits.

In sum, DEQ concludes that this discharge permit complies with the Tier II provisions of Idaho's WQS (IDAPA 58.01.02.051.02 and IDAPA 58.01.02.052.06).

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

Mixing Zones

Pursuant to IDAPA 58.01.02.060, DEQ authorizes a zone of initial dilution encompassing 21% of the 1Q10 stream flow and a mixing zone encompassing 25% of the 30Q5 stream flow of Orofino Creek for ammonia and a zone of initial dilution and mixing zone encompassing 25% of the 1Q10 and 7Q10 stream flows, respectively, for chlorine.

Other Conditions

This certification is conditioned upon the requirement that any material modification of the permit or the permitted activities—including without limitation, any modifications of the permit to reflect new or modified TMDLs, wasteload allocations, site-specific criteria, variances, or

other new information—shall first be provided to DEQ for review to determine compliance with Idaho WQS and to provide additional certification pursuant to Section 401.

Right to Appeal Final Certification

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

Questions or comments regarding the actions taken in this certification should be directed to Sujata Connell at 208-799-4370, or Sujata.Connell@deq.idaho.gov.

DRAFT

John Cardwell
Regional Administrator
Lewiston Regional Office