Fact Sheet for IPDES Permit No. ID0023604

9/22/2021

Idaho Department of Environmental Quality (DEQ) proposes to reissue an Idaho Pollutant Discharge Elimination System (IPDES) Permit to discharge pollutants pursuant to the provisions of IDAPA 58.01.25 to:

City of Troy
P.O. Box 595
Troy, Idaho 83871

Public Comment Start Date:	9/22/2021
Public Comment Expiration Date:	10/22/2021
Technical Contact:	Jonathan Drygas 208-373-0173 Jonathan.drygas@deq.idaho.gov

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Purpose of this Fact Sheet

This fact sheet explains and documents the decisions the Idaho Department of Environmental Quality (DEQ) made in writing the draft Idaho Pollutant Discharge Elimination System (IPDES) permit for the City of Troy.

This fact sheet complies with IDAPA 58.01.25.108.02 of the Idaho Administrative Code, which requires DEQ to prepare a permit and accompanying fact sheet for public evaluation before issuing an IPDES permit.

Table of Contents

Acronyms 5
1 Introduction 7
2 Background Information 9
2.1 Facility Description 9
2.1.1 Facility Information 9
2.1.2 Permit History 10
2.1.3 Compliance History 10
2.1.4 Sludge/Biosolids 11
2.1.5 Outfall Description 12
2.1.6 Wastewater Influent Characterization 12
2.1.7 Wastewater Effluent Characterization 12
2.2 Description of Receiving Water 13
2.2.1 Water Quality Impairments 14
2.2.2 Critical Conditions 15
2.3 Pollutants of Concern 15
3 Effluent Limits and Monitoring 16
3.1 Basis for effluent limits 20
3.2 Technology-Based Effluent Limits 20
3.2.1 Mass-Based Limits 20
3.3 Water Quality-Based Effluent Limits 21
3.3.1 Statutory and Regulatory Basis 21
3.3.2 Reasonable Potential Analysis (RPA) and Need for Water Quality-Based Effluent Limits 22
3.3.3 Reasonable Potential and Water Quality-Based Effluent Limits 22
3.4 Narrative Criteria 25
3.5 Antidegradation 25
3.5.1 Protection and Maintenance of Existing Uses (Tier I Protection) 26
3.5.2 High-Quality Waters (Tier II Protection) 26
3.6 Antibacksliding 27
4 Monitoring Requirements 28
4.1 Influent Monitoring 28
4.1.1 Influent Monitoring Changes from the 2004 Permit 28
4.2 Effluent Monitoring 29
4.2.1 Effluent Monitoring Changes from the 2004 Permit 30
4.3 Receiving Water Monitoring 32
4.3.1 Receiving Water Monitoring Changes from the 2004 Permit 33

DRAFT

4.4 Permit Renewal Monitoring 33
5 Special Conditions 34
5.1 Compliance Schedule 34
5.2 Nondomestic Waste Management 35
5.3 Plans 35
5.3.1 Spill Control Plan 35
5.4 Inflow and Infiltration Evaluation 35
6 Standard Conditions 35
6.1.1 Quality Assurance Project Plan 36
6.1.2 Operation and Maintenance Manual 36
6.1.3 Emergency Response Plan 36
7 Compliance with other DEQ Rules 37
7.1 Operator's License 37
7.2 Lagoon Seepage Testing 37
7.3 Sludge/Biosolids 37
8 Permit Expiration or Modification 37
9 References for Text and Appendices 38
Appendix A. Facility Maps/Process Schematics 39
Appendix B. Technical Calculations 42
Appendix C. Your Right to Appeal 48
Appendix D. Public Involvement and Public Comments 49
A. Public Involvement Information 49
B. Public Comments and Response to Comments 49

List of Tables

Table 1. Facility information. 9
Table 2. Effluent limit violations from 5/1/2004 to 7/31/2018. 11
Table 3. Influent characterization. 12
Table 4. Effluent characterization. 13
Table 5. Ambient background data. 14
Table 6. Critical low flows for West Fork Little Bear Creek. 15
Table 7. 2004 Permit - Effluent Limits and Monitoring Requirements. 16
Table 8. 2019 Permit - Effluent Limits and Monitoring Requirements 18
Table 9. Secondary treatment effluent limits. 20
Table 10. Authorized mixing zones for City of Troy. 22
Table 11. Ammonia criteria. 23
Table 12. Comparison of 2004 and 2019 effluent limits. 27
Table 13. Influent monitoring requirements. 28
Table 14. Changes in Influent monitoring frequency from the 2004 permit to the 2019 permit. 29
Table 15. Additional Effluent Monitoring. 30

DRAFT

Table 16. Changes in Effluent monitoring frequency from 2004 permit to the 2019 permit. 31
Table 17. Up-Stream Receiving water monitoring requirements. 32
Table 18. Down-Stream Receiving water monitoring requirements. 32
Table 19 Changes in Receiving Water monitoring frequency from the 2004 permit to the 2019 permit. 33
Table 20. Effluent monitoring required for all permit renewals. 34
Table 21 Effluent testing required for permit renewals of facilities with a design flow greater than or equal to 0.1 mgd. 34

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Acronyms

1Q10	1-day, 10 year low flow
7Q10	7-day, 10 year low flow
30Q5	30-day, 5 year low flow
AML	Average Monthly Limit
BOD_5	Biochemical oxygen demand, five-day
°C	Degrees Celsius
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
CV	Coefficient of Variation
CWA	Clean Water Act
DEQ	Idaho Department of Environmental Quality
DMR	Discharge Monitoring Report
EPA	U.S. Environmental Protection Agency
IDAPA	Refers to citations of Idaho administrative rules
IDWR	Idaho Department of Water Resources
I/I	Inflow and Infiltration
IPDES	Idaho Pollutant Discharge Elimination System
lb/day	Pounds per day
LTA	Long Term Average
mgd	Million gallons per day
mg/L	Milligrams per liter
mL	Milliliters
POC	Pollutant(s) of Concern
POTW	Publicly Owned Treatment Works
QAPP	Quality Assurance Project Plan
RPA	Reasonable Potential Analysis
RPMF	Reasonable Potential Multiplication Factor
RPTE	Reasonable Potential To Exceed
SIU	Significant Industrial User
s.u.	Standard Units
TBEL	Technology Based Effluent Limits

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TMDL	Total Maximum Daily Load
TRC	Total Residual Chlorine
TSD	Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001)
TSS	Total suspended solids
USGS	United States Geological Survey
WLA	Wasteload allocation
WQBEL	Water quality-based effluent limit
WQC	Water Quality Criteria
WQS	Water Quality Standards

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1 Introduction

This fact sheet provides information on the permit for the Idaho Department of Environmental Quality (DEQ) Idaho Pollutant Discharge Elimination System (IPDES) permit for the City of Troy (City). This fact sheet complies with the Rules Regulating the Idaho Pollutant Discharge Elimination System Program (IDAPA 58.01.25), which requires DEQ to prepare a draft permit and accompanying fact sheet for public evaluation before issuing an IPDES permit.

DEQ proposes to reissue the IPDES permit for the City's Publicly Owned Treatment Works (POTW). To ensure protection of water quality and human health, the permit places conditions on the type, volume, and concentration of pollutants discharged from the facility to waters of the United States.

This fact sheet includes:

- A map and description of the discharge location;
- A listing of draft effluent limits and other conditions the facility must comply with;
- Documentation supporting the draft effluent limits;
- Technical material supporting the conditions in the permit; and
- Information on public comment, public hearing, and appeal procedures.

Terms used in this fact sheet are defined in Section 5, Definitions, of the permit.

Public Comment

The permit application, draft permit, and fact sheet describing the terms and conditions applicable to the permit are available for public review and comment during a public comment period. The public is provided at least 30 days to provide comments to DEQ. Persons wishing to request a public meeting for this facility's draft permit must do so in writing within 14 calendar days of public notice being published that a draft permit has been prepared; requests for public meetings must be submitted to DEQ by 10/6/2021. Requests for extending a public comment period must be provided to DEQ in writing before the last day of the comment period. For more details on preparing and filing comments about these documents, please see the IPDES guidance *Public Participation in the Permitting Process* at *https://www2.deq.idaho.gov/admin/LEIA/api/document/download/4814*. For more information, please contact the permit writer.

After the close of the public comment period, DEQ considers information provided by the public, prepares a document summarizing the public comments received, and may make changes to the draft permit in response to the public comments. DEQ will include the summary and responses to comments in Appendix D of the final fact sheet. After the public comment period and prior to issuing the final permit decision, DEQ will also provide the applicant an opportunity to submit additional information to respond to public comments. DEQ may request more information from the applicant in order to respond to public comments (IDAPA 58.01.25.109.02.h.).

DEQ will assess the public comment in conjunction with any additional information received from the applicant and develop a proposed permit.

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The Environmental Protection Agency (EPA) may take up to 90 days from the publication of public notice of the draft permit to develop and document specific grounds for objections to a proposed permit. If EPA objects to a proposed permit DEQ must satisfactorily address the objections within the time period specified in the memorandum of agreement between EPA and DEQ (40 CFR 123.44). Otherwise, EPA may issue a permit in accordance with 40 CFR 121, 122, 124. If EPA issues the permit, any state, interstate agency, or interested person may request EPA hold a public hearing regarding the objection.

Permit Issuance

Following the public comment periods on a draft permit and after receipt of any comments on the proposed permit from EPA, DEQ will issue a final permit decision, the final permit, and the fact sheet. A final permit decision means a final decision to issue, deny, modify, revoke and reissue, or terminate a permit (IDAPA 58.01.25.107.04.). The final permit and final fact sheet will be posted on the DEQ webpage. Response to comments will be located in the final fact sheet as an appendix.

The public has access to a permit appeals process (IDAPA 58.01.25.204). Appeal of a final IPDES permit decision begins by filing a petition for review with DEQ's hearing coordinator within 28 days after DEQ serves notice of the final permit decision. The permit holder or applicant and any person or entity who filed comments or who participated in the public meeting on the draft permit may file a petition for review. Ultimately, any person aggrieved by a final IPDES action or determination has a right to judicial review by filing a petition for review (IDAPA 58.01.25.204.26).

Documents are Available for Review

The draft IPDES permit and fact sheet can be reviewed or obtained by visiting or contacting the DEQ State office between 8:00 a.m. and 5:00 p.m., Monday through Friday at the address below. The draft permit, and fact sheet can also be found by visiting the DEQ website at *https://www.deq.idaho.gov/public-information/public-comment-opportunities/*.

DEQ
1410 N. Hilton St.
Boise, ID 83706
208-373-0502
Toll-free 888-800-3480

The fact sheet and draft permits are also available at the DEQ Regional Office:

Lewiston Regional Office
1118 F Street
Lewiston, ID 83501
208-799-4370
Toll-free 877-541-3304

Disability Reasonable Accommodation Notice

For technical questions regarding the permit or fact sheet, contact the permit writer at the phone number or e-mail address at the beginning of this fact sheet. Those with impaired hearing or

speech may contact a TDD operator at 1-800-833-6384 (ask to be connected to the permit writer at the above phone number). Additional services can be made available to a person with disabilities by contacting the permit writer.

2 Background Information

2.1 Facility Description

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

Table 1. Facility information.

Permittee	City of Troy POTW
Facility Physical Address	4008 Highway 8 Troy, ID 83871
Facility Mailing Address	P.O. Box 595 Troy, ID 83871
Facility Contact	Danny Haskell Maintenance Supervisor and Operator (208) 835-2742
Responsible Official	Steve Corr Mayor (208) 835-2741
Facility Location	Latitude: 46.7314 Longitude: -116.7572
Receiving Water Name	West Fork Little Bear Creek
Outfall Location	Latitude: 46.7297 Longitude: -116.7573
Permit Status	
Application Submittal Date	7/16/2012
Date Application Deemed Complete	3/25/2013

The City owns and operates the Troy POTW located in Troy, Latah County, Idaho. The collection system has no combined sewers. The facility serves a resident population of 862 based on their permit application. There are no major or minor industries discharging to the facility.

2.1.1 Facility Information

The design flow of the facility is 0.19 mgd, therefore is considered a minor facility. The treatment process consists of a manual course rack and a sludge grinder at the headworks, three cement aerated lagoons, a solids settling basin, and a chlorination/dechlorination system before discharging to the West Fork Little Bear Creek.

Influent enters the plant at the headworks where it passes through a muffin monster comminutor. Influent then enters the first of three cement lined, aerated basins that are operated in series. The application submitted to EPA in 2012 indicated that the facility has estimated inflow and

infiltration (I/I) of 150,000 gallons per day. Cell 1 and Cell 2 each have the capacity 500,000 gallons while Cell 3 has a capacity of 400,000. After Cell 3, flow passes to the clarification basin (Cell 4). In Cell 4, biosolids can be separated and returned to Cell 1. Flow from Cell 4 is drawn from the effluent weir and flows into the chlorination contact tank and disinfected. The effluent is dechlorinated and the flow measured before the effluent travels through a 14 inch diameter pipe to Outfall 001 and discharged to West Fork Little Bear Creek.

Details about the wastewater treatment process and a map showing the location of the treatment facility and discharge are included in Appendix A.

2.1.2 Permit History

The current Troy POTW was built in 1989 to replace a Smith and Loveless package plant that had been in operation for 23 years. In 2000, a biosolids disposal plan was developed and a biosolids holding tank built in 2001. In 2005, a dechlorination system was installed. The last permit was issued on March 5, 2004 with an effective date of May 1, 2004. The permit expired on April 30, 2009 without an application for renewal being submitted by the City. In 2010, EPA issued a compliance order and request for information directing the City to submit a complete application for a NPDES permit within 30 days of receipt of the order. The City submitted an application on July 16th, 2012. The application was deemed complete by EPA on March 25th, 2013.

2.1.3 Compliance History

Since 2004 there have been 196 reported effluent limit violations and 314 discharge monitoring report (DMR) non-receipt violations. 120 of the reported effluent limit violations and 60 of the DMR non-receipt occurred after the 2004 permit expired. All of the effluent limit violations since the 2004 permit became effective are listed below in Table 2.

In addition to the violations, three administrative orders by consent have been issued by EPA.

The first is the previously-mentioned 2010 compliance order for discharging without a permit, which required the City to submit a complete application within 30 days of receipt of the order. The 2010 order also stated that the City must comply with requirements of the expired 2004 permit.

In 2014, the City and EPA entered into a second order, which charged effluent violations from October 2008 to April 2009 and discharging without a permit from May 1, 2009 through August 31, 2013. The 2014 order required the City to submit annual reports to EPA and DEQ on all corrective actions taken within the last 12 months and milestones for the next 12 months towards achieving full compliance with all effluent limits. It also required the City to achieve full compliance by October 31, 2017 and provide written notification to EPA and DEQ that compliance has been achieved. DEQ has not received any annual reports or notice that compliance has been achieved. Additionally, the City was fined a civil penalty of $14,500 by EPA for the violations.

The last order was agreed to and issued in 2019. The order noted that the facility would have violated its expired permit effluent limitations for a 22 month period spanning from December 2013 through June 2018. The City agreed to pay a penalty of $7,250 to settle the violations. The

order also requires the City to complete several actions including several facility maintenance activities and the completion of a Facility plan by September 30th 2020.

Table 2. Effluent limit violations from 5/1/2004 to 7/31/2018.

Parameter Exceeding Permit Limits	Limit	Units	Number of Reported Instances
BOD_5	Monthly Average	mg/L	20
BOD_5	Weekly Average	mg/l	5
BOD_5	Monthly Average	lb/day	2
BOD_5	Weekly Average	lb/day	1
BOD_5	Percent Removal	%	1
TSS	Monthly Average	mg/L	16
TSS	Weekly Average	mg/L	7
TSS	Percent Removal	%	1
pH	Minimum	s.u.	2
E. coli	Monthly Average	#/100 ml	16
E. coli	Instantaneous Maximum	#/100 ml	60
Chlorine	Monthly Average	mg/L	18
Chlorine	Daily Maximum	mg/L	19
Chlorine	Monthly Average	lb/day	13
Chlorine	Daily Maximum	lb/day	15

The facility has been inspected 4 times since the 2004 permit was issued, with EPA conducting the last inspection in August 2016. The other years of inspections were 2007, 2010 and 2012. The 2016 inspection encompassed the wastewater treatment process, records review and operation and maintenance. The inspection found several areas of concern including needing an updated quality assurance plan, improper composite sample preservation (aliquots of the composite samples were not being chilled during the 8 hour sample collection) and at the time of inspection, no annual progress reports had been submitted to EPA or DEQ as required by the 2014 order.

2.1.4 Sludge/Biosolids

The EPA Region 10, under the authority of the CWA, issues separate sludge-only permits for the purpose of regulating biosolids. Permits for sludge management are independent of IPDES discharge permits and must be obtained from EPA. The IPDES program will take over permitting of sludge/biosolids in July 2021. In addition, sludge management plans must be submitted to DEQ and must follow the procedures in IDAPA 58.01.16.

The City developed and maintains a biosolids disposal plan for land application approved by DEQ in December 2001. This permit will require the facility to assess the sludge level accumulated in Cell 3; this sludge depth information will be reported as part of the next permit application package.

2.1.5 Outfall Description

The facility discharges continuously through Outfall 001 located at 46.7297°, -116.7573° into the West Fork Little Bear Creek. The outfall is a 14 inch diameter iron pipe that is above the surface of the creek. A warning sign is located on the bank near the pipe.

2.1.6 Wastewater Influent Characterization

The City reported the pollutant concentration of influent on DMRs and results are characterized in Table 3 from May of 2004 to July of 2018.

Table 3. Influent characterization.

Parameter	Units	# of Samples	Average Value	Maximum Value	Data Source
Total Suspended Solids (TSS)	mg/L	166	3826	32800	DMR
Biochemical Oxygen Demand (BOD_5)	mg/L	166	1080	7760	DMR

After discussions with the City and additional intensive sampling in preparation of this permit, DEQ determined that a sampling method error led to artificially high values for TSS and BOD_5 in Table 3. There were a total of 6 influent samples collected in October of 2018 after a demonstration of the proper sampling technic. The average value of the 6 samples for TSS was 261 mg/L and the average value for BOD_5 was 260 mg/L. The maximum value for TSS from the October 2018 sampling was 380 mg/L and BOD_5 had a maximum value of 340 mg/L.

2.1.7 Wastewater Effluent Characterization

The City reported the effluent pollutant concentrations on DMRs and results are characterized in Table 4. Data was also collected during a University of Idaho study in the months of May to October in 2009 and 2010. The tabulated data represents the quality of the effluent discharged from May 2004 to July 2018. Since there was an influent sampling method error, percent removal of TSS and BOD_5 are not included as the data are not accurate.

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Table 4. Effluent characterization.

Parameter	Units	# of Samples	Average Values	Maximum Values	Data Source
BOD_5	mg/L	164	16.12	79.80	DMR
BOD_5	lb/day	164	9.41	84.30	DMR
TSS	mg/L	159	18.11	70	DMR
TSS	lb/day	159	9.9	43.70	DMR
Total Residual Chlorine	mg/L	270	0.3	2.00	DMR
Total Residual Chlorine	lb/day	256	.34	2.00	DMR
Ammonia	mg/L	42	11.72	28.00	DMR and University of Idaho study
NO_2 +NO_3	mg/L	41	7.72	27.00	University of Idaho study
Total Kjeldahl Nitrogen	mg/L	35	18.21	28.00	University of Idaho study
Organic Nitrogen	mg/L	24	6.73	12.00	University of Idaho study
Soluble Reactive Phosphorus	mg/L	41	3.29	4.60	University of Idaho study
Total Phosphorus	mg/L	41	3.95	5.00	University of Idaho study
Organic Phosphorus	mg/L	41	0.65	1.3	University of Idaho study
Temperature	°C	97	16.35	22.8	DMR and University of Idaho study
Parameter	**Units**	**# of Samples**	**Average Geometric Mean**	**Maximum Reported Geometric Mean**	
E. Coli	#/100 ml	165	73.62	2094	DMR
Parameter	**Units**	**# of Samples**	**Minimum Value**	**Maximum Value**	
pH	standard units	673	6.2	8.7	DMR and Raw data from City of Troy

2.2 Description of Receiving Water

Troy's POTW discharges to the West Fork Little Bear Creek in the Clearwater subbasin (HUC 17060306) Water Body Unit C-61_03. The West Fork Little Bear Creek does not have designated uses at the point of discharge, but it is protected for the following presumed and existing uses (IDAPA 58.01.02.120.08 C-61, 58.01.02.101.01):

- Cold Water Aquatic Life (Presumed)
- Salmonid Spawning (Existing)

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- Secondary Contact Recreation (Presumed)

The outfall is located 260 yards downstream of the confluence of West Fork Little Bear Creek and Big Meadow Creek. For more information on the outfall see section 2.1.5. Downstream point sources include the City of Kendrick and the City of Juliaetta, 10.5 and 14.5 miles respectively, from the Troy outfall with both discharging into the Potlatch River. One downstream drinking water intake is located in the City of Juliaetta on the Potlatch River. Potential non-point sources that are present in the watershed are silviculture and agriculture. No upstream point sources exist. Section 2.2.1 of this fact sheet describes any receiving waterbody impairments.

The ambient background data used for this permit includes the following from a 2009-2010 University of Idaho study of the West Fork Little Bear Creek. The sampling location of the data was approximately 200 meters upstream of Troy's outfall (Brooke, E; et al 2011). There are no other sources of ambient background water quality data for West Fork Little Bear Creek between the confluence of Big Meadow Creek with West Fork Little Bear Creek and the City of Troy's outfall. The water quality for the receiving water is summarized in Table 5.

Table 5. Ambient background data.

Parameter	Units	Percentile	Value
Temperature	°C	95th	22.1
pH	Standard units	5th – 95th	6.1 - 8.3
Ammonia	mg/L	90th	0.138
Total Phosphorus	mg/L	maximum	0.181

2.2.1 Water Quality Impairments

Water bodies not supporting existing or designated beneficial uses must be identified as water quality limited, and a total maximum daily load (TMDL) must be prepared for those pollutants causing impairment. A central purpose of TMDLs is to establish wasteload allocations (WLAs) for point source discharges, which are set at levels designed to help restore the water body to a condition that supports existing and designated beneficial uses. Discharge permits must contain limits that are consistent with the assumptions and requirements of WLAs that have been assigned to the discharge in an EPA-approved TMDL.

According to Idaho's 2016 Integrated Report, this assessment unit (AU) is not supporting one or more of its assessed uses. The aquatic life use status is not supporting due to total nitrogen (TN) and sedimentation/siltation (TSS) impairments. The salmonid spawning use is not supporting due to sedimentation/siltation. The contact recreation use status is not supporting due to *Escherichia coli (E. coli).* As such, DEQ will provide Tier 1 for the aquatic life use, salmonid spawning, and contact recreation use (IDAPA 58.01.02.052.01).

The EPA-approved *Potlatch River Subbasin Assessment and TMDLs* (DEQ 2008) establishes WLAs for the City for TSS (monthly average load allocation of 42.8 lb/day and a maximum daily load allocation of 114.1 lb/day) and *E. coli* bacteria (instantaneous maximum load allocation 406 #/100 mL and a 30-day load allocation of 126 #/100 ml). These WLAs are designed to meet narrative and numeric criteria and ultimately help restore the water body to a

condition that supports existing and beneficial uses. The effluent limits and associated requirements contained in the draft permit are set at levels that are consistent with the TMDL.

In addition to TSS and *E. coli* TMDL WLAs, a TMDL was also written for total inorganic nitrogen (TIN) for West Fork Little Bear Creek (DEQ 2008). The total inorganic nitrogen TMDL did not assign a wasteload allocation to the City's POTW specifically but did assign one to West Fork Little Bear Creek at a control point 0.33 miles downstream of City's Outfall 001 (46.7253, -116.7562). Further data on the load within West Fork Little Bear Creek and the load coming from the City of Troy is needed to develop a WLA for the City of Troy.

2.2.2 Critical 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 low flow design conditions (See IDAPA 58.01.02.210.03) shown in Table 6. The 1Q10 represents the lowest one day flow with a recurrence frequency of once in 10 years. The 7Q10 represents lowest average seven-day consecutive flow with a recurrence frequency of once in 10 years. The 30Q5 represents the lowest average 30-day consecutive flow with a recurrence frequency of once in five years.

For this permit, DEQ determined critical low flows upstream of the discharge using the USGS StreamStats application. The flows were calculated for the watershed above Troy's POTW excluding 1.35 square miles above the City's drinking water reservoir. The area above the reservoir was excluded because there is no flow released from the dam during low flow conditions. Additionally, the area of the drainage above the dam only accounts for 5% of the total drainage area and the difference between the critical flows was de minimis.

The critical low flows are presented in Table 6.

Table 6. Critical low flows for West Fork Little Bear Creek.

Flows	Annual Flow (cfs)
1Q10	0.454
7Q10	0.63
30Q5	0.973
Source: USGS StreamStats	

2.3 Pollutants of Concern

DEQ may identify pollutants of concern (POC) for the discharge based on, but not limited to, those which:

- Have a technology-based limit (TBEL)
- Have an assigned WLA from a TMDL
- Had an effluent limit in the previous permit
- Are present in the effluent monitoring data reported in the application, DMRs, or special studies
- Are expected to be in the discharge based on the nature of the discharge
- Are impairing the beneficial uses of the receiving water

To determine POCs for further analysis, DEQ evaluated all pertinent and available information such as the permit application, previous DMRs, raw discharge data provided by the facility, TMDLs and the facility's industrial user surveys. The wastewater treatment process for this facility includes three (3) aerated lagoons, a settling basin followed by chlorination and dechlorination. Pollutants expected in the discharge from a facility with this type of treatment, include but are not limited to:

- BOD_5
- TSS
- *E. coli*
- Total Residual Chlorine (TRC)
- pH
- Ammonia
- Nitrate plus Nitrite (NO_2+NO_3)
- Total Phosphorus

3 Effluent Limits and Monitoring

Table 7 presents the effluent limits and monitoring requirements in the 2004 Permit. Proposed draft effluent limits and monitoring requirements are presented in Table 8.

Table 7. 2004 Permit - Effluent Limits and Monitoring Requirements.

Parameter	Effluent Limits					Monitoring Requirements		
	Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit	Instantaneous Maximum Limit	Instantaneous Minimum Limit	Sample Location	Sample Frequency	Sample Type
Flow	---	---	---	---	---	Effluent	5/week	Measured
Biochemical Oxygen Demand (BOD_5)	30 mg/L	45 mg/L	---	---	---	Influent and Effluent	1/month	8-hour composite
	48 lb/day	71 lb/day	---	---	---			
Total Suspended Solids (TSS)	30 mg/L	45 mg/L	---	---	---	Influent and Effluent	1/month	8-hour composite
	48 lb/day	71 lb/day	---	---	---			
E. Coli Bacteria[1,2]	126/100 ml	---	---	406/100 ml	---	Effluent	5/month	Grab
Total Residual Chlorine[2,3,4]	0.01 mg/L	---	0.02 mg/L	---	---	Effluent	1/week	Grab
	0.01 lb/day	---	0.03 lb/day	---	---			
Temperature[5], °C	---	---	---	---	---	Effluent	1/week	Grab
Total Ammonia as N, mg/L[5]	---	---	---	---	---	Effluent	1/month	8-hour composite
pH	---	---	---	9.0	6.5	Effluent	1/week	Grab

1. The average monthly E. coli counts must not exceed a geometric mean of 126/100 ml based on a minimum of five samples taken every 3-5 days within a calendar month. See Part I.G. for definition of geometric mean.
2. Reporting is required within 24 hours of a maximum daily limit or instantaneous maximum limit violation. See Part II.G.

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Parameter	Effluent Limits					Monitoring Requirements		
	Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit	Instantaneous Maximum Limit	Instantaneous Minimum Limit	Sample Location	Sample Frequency	Sample Type
3. The average monthly and maximum daily concentration limits for chlorine are not quantifiable using EPA approved test methods. The permittee will be in compliance with the effluent limits for chlorine provided the average monthly and maximum daily total chlorine residual levels are at or below the compliance evaluation level of 0.1 mg/L, with a loading at or below 0.2 lb/day.								
4. Chlorine effluent limits shall become effective May 1, 2007, in accordance with the conditions of the Compliance Schedule in Part I.B., below.								
5. Monitoring shall be conducted once per month starting in January 2006 and lasting for one year.								

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Table 8. 2019 Permit - Effluent Limits and Monitoring Requirements

Parameter	Units	Effluent Limits						Monitoring Requirements		Reporting Frequency (DMR Months)
		Monthly Average	Weekly Average	Monthly Geometric Mean	Instantaneous Minimum	Instantaneous Maximum	Daily Maximum	Sample Type	Sample Frequency	
BOD_5	mg/L	30	45	—	—	—	—	8-hour Composite	2/month	Monthly (January-December)
	lb/day	48	71	—	—	—	—	Calculation[a]		
BOD_5	% Removal[b]	85 (minimum)	—	—	—	—	—	Calculation[a]	1/month	
Total Suspended Solids (TSS)	mg/L	30	45	—	—	—	—	8-hour Composite	2/month	Monthly (January-December)
	lb/day	42.8	71	—	—	—	114.1	Calculation[a]		
TSS	% Removal[b]	85 (minimum)	—	—	—	—	—	Calculation[a]	1/month	
E. coli[c]	#/100 ml	—	—	126	—	—	—	Grab[d]	5/month	Monthly (January-December)
Total Residual Chlorine[e,f]	mg/L	0.01	—	—	—	—	0.03	Grab[d]	1/week	Monthly (January-December)
	lb/day	0.02	—	—	—	—	0.04	Calculation[a]		
pH[g]	s. u.	—	—	—	6.5	9.0	—	Grab[d]	2/week	Monthly (January-December)
Ammonia	mg/L	12	—	—	—	—	39	8-hour Composite	1/week	Monthly (January-December)
	lb/day	19	—	—	—	—	62	Calculation[a]		

a. Calculation means figured concurrently with the respective sample, using the following formula: Concentration (in mg/L) X Flow (in mgd) X Conversion Factor (8.34) = lb/day
b. % Removal= ([Influent](mg/L)-[Effluent](mg/L))/([Influent](mg/L))×100
Braces "[ ]" indicate concentration of the attribute contained inside
Calculate the percent (%) removal of BOD_5 and TSS using the above equation.
c. The average monthly E. coli bacteria counts must not exceed a geometric mean of 126 organisms/100 ml based on a minimum of five samples taken every 3 – 7 days within a calendar month.
d. Grab means an individual sample collected over a fifteen (15) minute, or less, period.

DRAFT

e. The limits for chlorine are not quantifiable using EPA-approved analytical methods. The minimum level (ML) for chlorine is 50 µg/L for this parameter. DEQ will use 50 µg/L as the compliance evaluation level for this parameter. The permittee will be compliance with the total residual chlorine limits if the average monthly and maximum daily concentrations are less than 50 µg/L and the average monthly and maximum daily mass loadings are less than 0.05 lb/day. For purposes of calculating the monthly averages, see Section 2.2.2 of the permit.
f. Report the instantaneous minimum and maximum for the monitoring period.

DRAFT

3.1 Basis for effluent limits

Regulations require that effluent limits in an IPDES permit must be either technology-based or water quality-based.

TBELs are set according to the level of treatment that is achievable using available technology and are based upon the treatment processes used to reduce specific pollutants. TBELs are set by the EPA and published as a regulation. DEQ may develop a TBEL on a case-by-case basis (40 CFR 125.3, IDAPA 58.01.25.302, and IDAPA 58.01.25.303).

WQBELs are calculated so the effluent will comply with the Water Quality Standards (IDAPA 58.01.02) or the National Toxics Rule (40 CFR 131.36) applicable to the receiving water.

DEQ must apply the most stringent of these limits to each POC. These limits are described below.

3.2 Technology-Based Effluent Limits

IDAPA 58.01.25.302 requires that IPDES permits include applicable TBELs and standards, while 40 CFR 125.3(a)(1) states that TBELs for publicly-owned treatment works (POTWs) must be based on secondary treatment standards or as specified in 40 CFR 133. The following section explains secondary treatment effluent limits for the conventional pollutants discharged by POTWs: BOD_5, TSS, and pH. These effluent limits are given in 40 CFR 133 and are outlined in Table 9.

Table 9. Secondary treatment effluent limits.

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 (concentration)	85% (minimum)	—
pH	within the limits of 6.0 - 9.0 s.u.	

The City's POTW does not qualify for equivalent to secondary treatment due to the design of the plant. The aeration basins do not meet the specifications of a lagoon in IDAPA 58.01.16.493.09.

3.2.1 Mass-Based Limits

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

$$\textit{Mass based limit (lb/day)} = \textit{concentration limit (mg/l)} \times \textit{design flow (mgd)} \times 8.34^{i}$$

[i] 8.34 is a conversion factor with units $(lb \times L)/(mg \times gallon \times 10^6)$

BOD_5

Since the design flow for this facility is 0.19 mgd, the technology-based mass limits for BOD_5 are limited to two significant figures and are calculated as follows:

Average Monthly Limit = 30 mg/l × 0.19 mgd × 8.34 = 48 lb/day

Average Weekly Limit = 45 mg/l × 0.19 mgd × 8.34 = 71 lb/day

TSS

The concentration and removal rate limits for TSS are the TBELs from 40 CFR 133.102. However, the mass limits are required to maintain consistency with the WLA in the *Potlatch River Subbasin Assessment and TMDLs* (DEQ 2008) for TSS. See discussion in 3.3.3.6 for final effluent limits.

Average Monthly Limit = 30 mg/l x 0.19 mgd x 8.34 = 48 lb/day

Average Weekly Limit = 45 mg/l x 0.19 mgd x 8.34 = 71 lb/day

3.3 Water Quality-Based Effluent Limits

3.3.1 Statutory and Regulatory Basis

Section 301(b)(1)(C) of the Clean Water Act (CWA) requires the development of limits in permits necessary to meet WQS. The IPDES regulation IDAPA 58.01.25.302.06 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. Effluent limits must also meet the applicable water quality requirements of affected States other than the State in which the discharge originates, which may include downstream States (IDAPA 58.01.25.103.03, IDAPA 58.01.25.302.06, see also CWA Section 401(a)(2)).

The regulations require the permitting authority to make this evaluation using procedures that account for existing controls on point and non-point 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 TMDL WLA for the discharge. If there are no approved TMDLs that specify WLAs for this discharge, all of the WQBELs are calculated directly from the applicable WQS.

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3.3.2 Reasonable Potential Analysis (RPA) and Need for Water Quality-Based Effluent Limits

DEQ uses the process described in the *Effluent Limit Development Guidance* (DEQ 2017) to determine reasonable potential. To determine if there is reasonable potential for the discharge to cause or contribute to an exceedance of water quality criteria (WQC) for a given pollutant, DEQ compares the maximum projected receiving water concentration to the WQC for that pollutant. If the projected receiving water concentration exceeds the criteria, there is reasonable potential, and a WQBEL must be included in the permit.

In some cases, a dilution allowance or mixing zone is permitted. A mixing zone is a limited area or volume of water where initial dilution of a discharge takes place and within which certain water quality criteria may be exceeded (IDAPA 58.01.02.060). While the criteria may be exceeded within the mixing zone, the use and size of the mixing zone must be limited such that the waterbody as a whole will not be impaired, all designated uses are maintained and acutely toxic conditions are prevented.

The draft mixing zones for this facility's pollutants are summarized in Table 10. The calculated mixing zones do not impede receiving water beneficial uses.

Table 10. Authorized mixing zones for City of Troy.

Pollutant	Discharge Period	Authorized Mixing Zone (% of Critical Low Flow)	
		Aquatic Life	
		Acute (1Q10)	Chronic (7Q10 or 30Q5)
Ammonia	Year Round	25% of 0.454 cfs	25% of 0.973 cfs (30Q5)
Total Residual Chlorine	Year Round	25% of 0.454 cfs	25% of 0.63 cfs (7Q10)

DEQ also calculated dilution factors for seasonal critical low flow conditions. All dilution factors are calculated with the effluent flow rate set to the design flow of 0.19 mgd (IDAPA 58.01.02.060.01.c).

The RPA and WQBEL calculations were based on mixing zones shown in Table 10. The equations used to conduct the RPA and calculate the WQBELs are provided in Appendix B.

3.3.3 Reasonable Potential and Water Quality-Based Effluent Limits

The reasonable potential and WQBELs for specific parameters are summarized below. The calculations are provided in Appendix B.

3.3.3.1 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, the criteria become more stringent as pH and temperature increase. The table below details the equations used to determine WQC for ammonia.

Table 11. Ammonia criteria.

Total ammonia nitrogen criteria (mg N/L):
Annual Basis
Based on IDAPA 58.01.02

INPUT	
1. Receiving Water Temperature (deg C):	20.4
2. Receiving Water pH:	8.03
3. Is the receiving water a cold water designated us	Yes
4. Are non-salmonid early life stages present or abs	Present
OUTPUT	
Total ammonia nitrogen criteria (mg N/L):	
Acute Criterion (CMC)	**5.26**
Chronic Criterion (CCC)	**1.59**

Acute Criteria Equation: Cold Water

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

Acute Criteria Equation: Warm Water

$$CMC = \frac{0.411}{1+10^{7.204-pH}} + \frac{58.4}{1+10^{pH-7.204}}$$

Chronic Criteria: Cold Water, Early Life Stages Present

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

Chronic Criteria: Cold Water, Early Life Stages Absent

$$CCC = \left(\frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}}\right) \bullet 1.45 \cdot 10^{0.028(25-T)})$$

The RPA for ammonia found that there was reasonable potential for ammonia to exceed aquatic life criteria. A 25% mixing zone will be authorized along with effluent limits to ensure aquatic life uses are protected. See Appendix B for reasonable potential and effluent limit calculations for ammonia.

The *Effluent Limit Development Guidance* (DEQ 2017) states that DEQ will use the 90th to 95th percentile of the ambient upstream receiving water temperature and pH to calculate ammonia criteria. Because the West Fork Little Bear Creek is impaired for total inorganic nitrogen, DEQ determined that the 90th percentile temperature and pH were appropriate for the ammonia calculation.

3.3.3.2 E. coli

The Idaho WQS state that waters of the State of Idaho that are designated for recreation (primary or secondary) are not to contain *E. coli* bacteria in concentrations exceeding a geometric mean of 126 organisms per 100 ml based on a minimum of five samples taken every three to seven days over a 30-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.). For waters designated only for secondary contact recreation the single sample maximum value is 576 organisms per 100 mL (IDAPA 58.01.02.251.01.b.i.).When a single sample maximum is exceeded, additional samples should be taken to assess compliance with the geometric mean criterion. However, the *Potlatch River Subbasin Assessment and TMDLs* (DEQ 2008) assigned a single sample maximum WLA of 406 organisms per 100 mL for *E. coli*. Reporting is required

within 24 hours of discovery of a maximum daily limit, instantaneous maximum limit violation, instantaneous minimum limit violation, or any noncompliance that may endanger public health or the environment. For E. coli the maximum daily threshold that triggers 24 hour reporting is 406 organisms/100 mL.

When a single sample maximum is exceeded, additional samples should be taken to assess compliance with the geometric mean criterion. Monitoring of the effluent will ensure compliance with the criterion can be assessed. If the single sample maximum is exceeded, the permittee may choose to monitor more frequently to ensure adequate disinfection and compliance with permit effluent limits. Regulations at IDAPA 58.01.25.303.04 require that effluent limits 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 IDAPA 58.01.25.10.06 and 07 respectively 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.

3.3.3.3 Total Residual Chlorine

The Idaho WQS in Table 1 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. An RPA showed that the discharge from the facility would have the reasonable potential to exceed aquatic life criteria. A 25% mixing zone is authorized along with effluent limits to ensure aquatic life uses are protected. The RPA result calculated limits that are less stringent that the previous permit. IDAPA 58.01.25.200.02.b.i allows for less stringent effluent limits than compared to the previous permit when new information is available that was not available when the previous permit was issued and which would have justified the application of a less stringent effluent limitation at the time. Critical low flows were not available for the previous permit which resulted in no mixing zone being granted. Since the critical low flows were available in this permit a mixing zone could be calculated, which resulted in slightly less stringent limits. The chlorine limits are still not quantifiable using EPA-approved analytical methods. The minimum level (ML) for chlorine is 50 µg/L for this parameter and DEQ will use 50 µg/L as the compliance evaluation level for this parameter. See Appendix B for the reasonable potential and effluent limit calculations for chlorine.

3.3.3.4 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 WQC must be met before the effluent is discharged to the receiving water.

3.3.3.5 Total Phosphorus

Total phosphorus has no numeric criteria; however, dischargers are required to meet narrative criteria in IDAPA 58.01.02.200.

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3.3.3.6 TSS

The *Potlatch River Subbasin Assessment and TMDLs* (DEQ 2008) has established mass-based TSS WLAs on a monthly average and maximum daily basis. The allocations are a monthly average allocation of 42.8 lb/day and a maximum daily allocation of 114.1 lb/day. The TMDL WLA will be used as the limits as well as the TBEL average weekly limit of 71 lb/day.

3.3.3.7 Dissolved Oxygen

The *Ecological Assessment of Current Impacts and Future Management of the City of Troy Waste Water Treatment Plant on Steelhead (Oncorhynchus Mykiss) Habitat in the West Fork Little Bear Creek Drainage* (2011) report collected DO from a site up stream of the discharge, downstream of the discharge and in the effluent. The data showed that the dissolved oxygen below the discharge was lower than the levels up stream of the discharge and in the effluent. Due to this monitoring will be required in the permit at all three locations to better understand the relation of the DO sag with other effluent pollutants. No limits have been set for DO in this permit.

3.4 Narrative Criteria

DEQ must incorporate the narrative criteria described in IDAPA 58.01.02.200 when it determines permit limits and conditions. Narrative WQC limit the toxic, radioactive, or other deleterious material concentrations that the facility may discharge which have the potential to adversely affect designated uses, cause acute or chronic toxicity to biota, impair aesthetic attributes, or adversely affect human health.

The Idaho WQS 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 permit contains a narrative limitation prohibiting the discharge of such materials or any violation of narrative WQC.

3.5 Antidegradation

DEQ's antidegradation policy provides three levels of protection to water bodies in Idaho subject to Clean Water Act (CWA) jurisdiction (IDAPA 58.01.02.051).

- Tier I of antidegradation protection is designed to ensure that existing uses and the water quality necessary to protect those uses is maintained and protected (IDAPA 58.01.02.051.01; 58.01.02.052.01). A Tier I review is performed for all new or reissued permits or licenses (IDAPA 58.01.02.052.07).
- Tier II protection applies to any water bodies considered to be high quality waters (where the water quality exceeds levels necessary to support propagation of fish, shellfish, wildlife, and recreation in and on the water) and provides that water quality will be maintained and protected unless allowing for lower water quality is deemed by the state as necessary to accommodate important economic or social development in the area. In allowing any lowering of water quality DEQ must ensure adequate water quality to protect existing uses fully and must assure that there will be achieved the highest

statutory and regulatory requirements for all new and existing point sources (IDAPA 58.01.02.051.02; 58.01.02.052.08).

- Tier III protection applies to water bodies that have been designated by the Idaho Legislature as outstanding national resource waters and provides that water quality is to be maintained and protected (IDAPA 58.01.02.051.03; 58.01.02.052.09).

DEQ employs 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).

3.5.1 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.

Water bodies not supporting existing or designated beneficial uses must be identified as water quality-limited, and a TMDL must be prepared for those pollutants causing impairment. A central purpose of TMDLs is to establish wasteload allocations for point source discharges, which are set at levels designed to help restore the water body to a condition that supports existing and designated beneficial uses. Discharge permits must contain limits that are consistent with wasteload allocations in the approved TMDL.

Prior to the development of the TMDL, the WQS require the application of the antidegradation policy and implementation provisions to maintain and protect uses (IDAPA 58.01.02.055.04). The EPA-approved *Potlatch River Subbasin Assessment and TMDLs* (DEQ 2008) establishes WLAs for TSS and *E. coli*. The effluent limits and associated requirements contained in the draft permit are set at levels that ensure compliance with the narrative and numeric criteria in the WQS and the wasteload allocations established in the TMDL. Therefore, DEQ has determined the permit will protect and maintain existing and designated beneficial uses in the West Fork Little Bear Creek in compliance with the Tier I provisions of Idaho's WQS (IDAPA 58.01.02.051.01 and 58.01.02.052.07).

3.5.2 High-Quality Waters (Tier II Protection)

The West Fork Little Bear Creek is not considered high quality for any beneficial use as all presumed and existing uses are impaired and no exception is applicable. Only Tier I protection will be applied to West Fork Little Bear Creek.

3.6 Antibacksliding

Sections 303(d) and 402(o) of the CWA, and regulations at IDAPA 58.01.25.200, generally prohibit the renewal, reissuance, or modification of an existing IPDES permit that contains effluent limits, permit conditions, or standards that are less stringent than those established in the existing permit (i.e., antibacksliding) but provide limited exceptions. For explanation of the antibacksliding exceptions refer to section 4.1 of the *Effluent Limit Development Guidance* (DEQ 2017).

DEQ compared the effluent limits in the 2004 permit with the draft permit in Table 12 below.

Table 12. Comparison of 2004 and 2021 effluent limits.

Pollutant	Units	2004 Permit			2021 Permit			Change[a]
		Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit	Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit	
Pollutants with limits in both the 2004 and 2019 permit								
BOD_5	mg/L	30	45		30	45		NC
	lb/day	48	71		48	71		NC
	% removal	85			85			NC
TSS	mg/L	30	45		30	45		NC
	lb/day	48	71		42.8	71	114.1	D
	% removal	85			85			NC
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
TRC (final)	mg/L	0.01		0.02	0.01		0.03	I
	lb/day	0.01		0.03	0.02		0.04	
Pollutants with new limits in the 2019 permit								
Total Ammonia	mg/L				12		39	D
	lb/day				19		62	
Pollutants with no limits in both the 2004 and 2019 permit								
Nitrate plus Nitrite	mg/L							NC
Temperature	°C							NC

[a] D = Decrease in pollutant load or concentration, I = Increase in pollutant load or concentration, NC = No change

An antibacksliding analysis was done for the City of Troy POTW. The analysis for each parameter is detailed below:

- BOD_5—No change.
- TSS—The draft permit limit is more stringent compared to the 2004 permit because of the application of the TMDL WLA therefore antibacksliding does not apply.
- pH—No change.
- *E. coli*—No change.

- TRC—The draft permit limit is increased compared to the 2004 permit because of the use of USGS StreamStats to calculate critical receiving water low flows for the 1Q10 and 7Q10. The 2004 permit used 0 cfs to calculate the limit. IDAPA 58.01.25.200.02.b.i allows for less stringent effluent limits than compared to the previous permit when new information is available that was not available when the previous permit was issued.
- Ammonia—The limit is more stringent in the draft permit therefore antibacksliding does not apply.
- Nitrate+nitrite—No change.
- Temperature—No change.

4 Monitoring Requirements

Idaho regulations IDAPA 58.01.02 and 58.01.25 require that monitoring be included in permits to determine compliance with effluent limits and other permit restrictions. Monitoring may also be required to gather data to assess the need for future effluent limits or to monitor effluent impacts on receiving water quality. Permittees are responsible for conducting the monitoring and reporting the results on monthly DMRs and in annual reports.

4.1 Influent Monitoring

Flow, TSS, and BOD_5 monitoring requirements are listed in Table 13. 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.

Table 13. Influent monitoring requirements.

Parameter	Monitoring Period	Units	Sample Frequency	Sample Type	Report	Reporting Frequency (DMR Months)
Flow	01/01 to 12/31	mgd	Continuous	Recording	Daily Maximum and Average Monthly	Monthly (All Months)
TSS	01/01 to 12/31	mg/L	2/month	8-hour composite	Daily Maximum and Average Monthly	
BOD_5	01/01 to 12/31	mg/L	2/month	8-hour composite	Daily Maximum and Average Monthly	

4.1.1 Influent Monitoring Changes from the 2004 Permit

Influent monitoring has increased for BOD_5 and TSS relative to the 2004 permit. Rationale and monitoring changes are presented in Table 14.

Table 14. Changes in Influent monitoring frequency from the 2004 permit to the 2021 permit.

Parameter	2004 Permit	2021 Permit	Rationale
Flow	None	Continuous	Due to the size of the facility, continuous monitoring is required. This is consistent with requirements for other facilities of similar design. Additionally continuous inflow monitoring will allow the City to track improvements made to the collection system in efforts to reduce the 150,000 gallons per day I/I issue.
TSS	1/month	2/month	The 2004 permit rate of one sample per month provides insufficient data to assess that limits are being achieved since only one sample is used to assess weekly and monthly limits. This puts the permittee at a disadvantage if the one sample exceeds limits and they do not elect to collect more samples. The adjustment in the monitoring frequency is to allow for a better analysis of the achievement of monthly average and weekly average permit limits.
BOD_5	1/month	2/month	The 2004 permit rate of one sample per month provides insufficient data to assess that limits are being achieved since only one sample is used to assess weekly and monthly limits. This puts the permittee at a disadvantage if the one sample exceeds limits and they do not elect to collect more samples. The adjustment in the monitoring frequency is to allow for a better analysis of the achievement of monthly average and weekly average permit limits.

4.2 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.

Pollutants that must be monitored but do not have effluent limits are presented in Table 15. The sampling location must be after the last treatment unit and prior to discharge to the receiving water. The samples must be representative of the volume and nature of the monitored discharge. If no discharge occurs during the reporting period, "no discharge" must be reported on the DMR.

Table 15. Additional Effluent Monitoring.

Parameter	Monitoring Period	Units	Sample Frequency	Sample Type	Report	Reporting Frequency (DMR Months)
Flow	01/01 to 12/31	mgd	Continuous	Recording	Daily Maximum and Monthly Average	Monthly (All Months)
Nitrate plus Nitrite[a]	01/01 to 12/31	mg/L	1/week	8-hour composite	Daily Maximum and Monthly Average	
Temperature[a]	01/01 to 12/31	°C	Continuous	Recording	Instantaneous Maximum and Monthly Average	
Dissolved Oxygen[b]	01/01 to 12/31	mg/L	1/week	Grab	Daily Maximum and Monthly Average	
E. coli	01/01 to 12/31	#/100mL	5/month	Grab	See below[c]	

a. Sample must be taken concurrently with Ammonia and pH samples.
b. Sample must be taken concurrently with Temperature sample.
c. Reporting is required within 24 hours of discovery of a single sample value greater than 406 #/100 ml. A value greater than this indicates likely exceedance of the geometric mean criterion, but is not by itself a violation of water quality standards or permit effluent limits.

4.2.1 Effluent Monitoring Changes from the 2004 Permit

Monitoring has increased for the multiple parameters relative to the 2004 permit. Changes in monitoring are presented in Table 16.

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Table 16. Changes in Effluent monitoring frequency from 2004 permit to the 2021 permit.

Parameter	2004 Permit	2021 Permit	Rationale
Flow	5/week	Continuous	Continuous flow data is already being collected.
TSS	1/month	2/month	The 2004 permit rate of one sample per month provides insufficient data to assess that limits are being achieved since only one sample is used to assess weekly and monthly limits. This puts the permittee at a disadvantage if the one sample exceeds limits and they do not elect to collect more samples. The adjustment in the monitoring frequency is to allow for a better analysis of the achievement of monthly average and weekly average permit limits in addition to the TMDL WLA.
BOD_5	1/month	2/month	The 2004 permit rate of one sample per month provides insufficient data to assess that limits are being achieved since only one sample is used to assess weekly and monthly limits. This puts the permittee at a disadvantage if the one sample exceeds limits and they do not elect to collect more samples. The adjustment in the monitoring frequency is to allow for a better analysis of the achievement of monthly average and weekly average permit limits.
Total Ammonia	1/month in 2006 only	1/week	Due to reasonable potential to exceed water quality standards, the presence of sensitive aquatic species and to ensure that the permit limit is met, monitoring shall occur once a week.
Nitrate plus Nitrite	none	1/week	West Fork Little Bear Creek has a TMDL for total inorganic nitrogen (TIN) but no waste load allocations have been developed for the Troy POTW due to lack of data. Collecting NO_2+NO_3 data along with ammonia data will allow for a TIN waste load allocation for the POTW to be developed.

DRAFT

Temperature	1/month in 2006 only	Continuous	Continuous monitoring is needed to better understand the impact of the effluent on the receiving water.
pH	1/week	2/week	One of the pH samples needs to be collected at the same time as the weekly ammonia sample are collected to apply water quality criteria. Based on bench sheets provided by the City of Troy, this sampling frequency is already occurring.
Dissolved Oxygen	None	1/week	DO monitoring is required due to the presence of salmonid species within the receiving water.

4.3 Receiving Water Monitoring

Table 17 presents the up-stream receiving water monitoring requirements for the draft permit. The City will establish an up-stream receiving water monitoring location above the discharge but below the confluence of Big Meadow Creek and West Fork Little Bear Creek. Receiving water monitoring results must be submitted with the DMR. Table 18 presents the down-stream receiving water monitoring requirements for the draft permit. The City will establish a down-stream receiving water monitoring location below any potential mixing of the effluent and receiving water.

Table 17. Up-Stream Receiving water monitoring requirements.

Parameter	Units	Frequency	Sample Type	Report	Reporting Frequency (DMR Months)
Flow[a]	cfs	1/month	Measured	Value	Monthly (All Months)
Ammonia[b]	mg/L	1/month	Grab	Value	
Nitrate plus Nitrite[b]	mg/L	1/month	Grab	Value	
pH[b]	SU	1/month	Grab	Value	
Temperature[b]	°C	Continuous	Recording	Instantaneous Max	
Dissolved Oxygen[b]	mg/L	1/month	Grab	Value	

a. Monitoring shall occur the same time as the rest of the receiving water monitoring.
b. Monitoring shall occur the same day as effluent sampling for the parameter with all samples taken in the same sampling event.

Table 18. Down-Stream Receiving water monitoring requirements.

Parameter	Units	Frequency	Sample Type	Report	Reporting Frequency (DMR Months)
Temperature[a,b]	°C	Continuous	Recording	Instantaneous Max	Monthly (All Months)

Dissolved Oxygen[a,b]	mg/L	1/month	Grab	Value	Monthly (All Months)

a. Monitoring shall occur the same time as the rest of the receiving water monitoring.
b. Monitoring shall occur the same day as effluent sampling for the parameter with all samples taken in the same sampling event.

4.3.1 Receiving Water Monitoring Changes from the 2004 Permit

Monitoring has increased for several parameters in the 2021 permit relative to the 2004 permit. Changes in monitoring are presented in Table 19.

Table 19 Changes in Receiving Water monitoring frequency from the 2004 permit to the 2019 permit.

Parameter	2004 Permit	2021 Permit	Rationale
Flow	---	1/month	Flow is needed to establish the load of the existing TIN values in the receiving water. The data will be used for the TIN TMDL development of a WLA for the City of Troy.
Ammonia	1/quarter	1/month	Ammonia monitoring is required to help further refine future reasonable potential analysis and is needed as part of establish the load of the existing TIN values in the receiving water. The data will be used for the TIN TMDL development of a WLA for the City of Troy.
Nitrate plus Nitrite	---	1/month	Nitrate plus Nitrite is needed to establish the load of the existing TIN values in the receiving water. The data will be used for the TIN TMDL development of a WLA for the City of Troy.
pH	1/quarter	1/month	pH monitoring is required when ammonia monitoring is conducted to assess water quality criteria.
Temperature	1/quarter	Continuous	Continuous monitoring is needed to better understand the impact of the effluent on the receiving water.
Dissolved Oxygen	None	1/Month	DO monitoring is required due to the presence of salmonid species within the receiving water.

4.4 Permit Renewal Monitoring

The permit renewal monitoring requires data collected to characterize the effect of the effluent on the West Fork Little Bear Creek. At a minimum, three scans of the final wastewater effluent for the parameters listed in Table 20 and Table 21 are required so that DEQ can assess the surface water impacts.

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Table 20. Effluent monitoring required for all permit renewals.

Parameter	Units	Sample Type	Report
pH	s.u.	Grab	Minimum and maximum value
Flow	mgd	Continuous	Maximum daily value, average daily value, number of samples
Temperature (February)	°C	Grab	
Temperature (August)	°C	Grab	
BOD_5	mg/L	24-hour composite	Maximum daily value, average daily value, analytical method and ML or MDL
TSS	mg/L	24-hour composite	
E. Coli	colonies/100 mL	Grab	

The facility has a design flow greater than or equal to 0.1 mgd and must also complete three scans of effluent testing for the parameters in Table 21.

Table 21 Effluent testing required for permit renewals of facilities with a design flow greater than or equal to 0.1 mgd.

Parameter	Units	Sample Type	Report
Ammonia (as N)	mg/L	24-hour composite	Maximum daily value, average daily value, analytical method and ML or MDL
Chlorine, Total Residual	mg/L	Grab	
Dissolved oxygen	mg/L	24-hour composite	
Total Kjeldahl Nitrogen	mg/L	24-hour composite	
Nitrate plus Nitrite	mg/L	24-hour composite	
Oil and grease	mg/L	Grab	
Phosphorus, Total (as P)	mg/L	24-hour composite	
Total dissolved solids	mg/L	24-hour composite	

An individual scan includes all parameters in Table 20 and Table 21. For parameters requiring a 24-hour composite sample, only one analysis of the composite of aliquots is required for each scan.

The permittee must conduct one permit renewal monitoring scan of the effluent according to the following schedule:

- 2022: First-third of the year (January through April)
- 2023: Second-third of the year (May through August)
- 2024: Third part of the year (September through December)

This schedule spreads monitoring over different season during the effectiveness of the permit.

5 Special Conditions

5.1 Compliance Schedule

IDAPA 58.01.25.305 and 40 CFR 122.47 allow for compliance schedules in IPDES permits to provide additional time for permittees to achieve compliance. Compliance schedules are required to achieve compliance with effluent limits as soon as possible. For compliance schedules lasting

longer than a year, interim requirements and the dates of achievement must be set. The permit includes a compliance schedule for the City to achieve the ammonia limits set in the permit. DEQ has determined that the compliance schedule will be six years, with yearly targets and reporting of progress. The compliance schedule of six years is similar to permit issued to the City of Kendrick on June 28, 2018 by the EPA. The list of yearly, interim compliance targets for the City of Troy can be found in the permit in Table 10.

5.2 Nondomestic Waste Management

The permittee has nonsignificant, nondomestic (industrial/commercial) users, which are neither subject to the pretreatment standards in 40 CFR 405 through 471, nor meet any of the criteria of a significant industrial user (SIU) as specified in 40 CFR 403.3(v), and therefore, DEQ does not require an authorized pretreatment program. The permittee must ensure that pollutants from nondomestic wastes discharged to their system do not negatively impact system operation or pass through the wastewater treatment facility. The permittee must not authorize indirect discharges of pollutants that would inhibit, interfere with, or otherwise be incompatible with operation of the wastewater treatment works, including interference with the use or disposal of municipal sludge.

5.3 Plans

5.3.1 Spill Control Plan

The permittee shall develop and implement a plan for spill control of chlorinating and dechlorinating chemical used by the facility.

5.4 Inflow and Infiltration Evaluation

The City reported on their 2013 application that the inflow and infiltration was 150,000 gpd. The City's consultant engineers indicated that in their current development of a facility plan verified this estimate and are developing a plan to address I/I. A formal I/I evaluation must be submitted with the information outlined in section 3.3 of the permit. The evaluation can either be a standalone document or as part of the facility plan as long as the information required is included. A yearly progress report on I/I will be required as part of the compliance schedule starting one year after the evaluation has been submitted. The report must include progress targets were achieved over the last year and when they were completed, what progress targets were not achieved, with explanations of why they were not achieved, any other progress that has been made addressing I/I issues that were not previously identified as targets for the year and what are the progress targets for the following year.

6 Standard Conditions

Section 4 of the draft permit contains standard regulatory language that must be included in all IPDES permits. DEQ bases the Standard Conditions on state and federal law and regulations.

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The standard regulatory language covers requirements such as monitoring, recording, and reporting requirements, compliance responsibilities, and other general requirements.

6.1.1 Quality Assurance Project Plan

In accordance with IDAPA 58.01.25.300.05, permittees are required to develop procedures to ensure that the monitoring data submitted is accurate and explain data anomalies if they occur. The permittee is required to develop, maintain, and implement a plan for all monitoring requirements in the permit. The quality assurance project plan (QAPP) shall consist of standard operating procedures for collecting, handling, storing and shipping samples, laboratory analysis, and data reporting. The plan shall be retained on site and made available to DEQ upon request.

6.1.2 Operation and Maintenance Manual

The permit requires the City of Troy to properly operate and maintain all facilities and systems of conveyance, 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 maintain, update as necessary and implement an operation and maintenance plan for their facility. The plan must be retained on site and made available to DEQ upon request.

6.1.3 Emergency Response Plan

The permittee must maintain and implement an emergency response plan that identifies measures to protect public health and the environment. At a minimum, the plan must include mechanisms for the following:

1. Ensure that the permittee is aware (to the greatest extent possible) of all overflows from portions of the collection system over which the permittee has ownership or operational control as well as any unanticipated treatment unit bypass or upset that may exceed any effluent limit in the permit.
2. Ensure that reports of an overflow or of an unanticipated bypass or upset that may exceed any effluent limit in this permit are immediately dispatched to appropriate personnel for investigation and response.
3. Ensure immediate notification to DEQ of any noncompliance that may endanger public health or the environment and identify the public health district and other officials who will receive immediate notification for items that require 24-hour.
4. Ensure that appropriate personnel understand, are appropriately trained on, and follow the Emergency Response Plan; and
5. Provide emergency facility operation.

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7 Compliance with other DEQ Rules

7.1 Operator's License

The permittee must meet the requirements and operator license levels listed in the wastewater rules at IDAPA 58.01.16.203 for the type(s) of operations at the facility.

7.2 Lagoon Seepage Testing

The permittee must comply with the Wastewater Rules in IDAPA 58.01.16, including the seepage testing requirements in IDAPA 58.01.16.493 for municipal lagoons. Prior to lagoon seepage testing, the permittee must consult DEQ. The seepage test report submittals to DEQ must be up-to-date per the IDAPA 58.01.16 timelines.

7.3 Sludge/Biosolids

DEQ separates wastewater and sludge permitting for the purposes of regulating biosolids. DEQ 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 503 and the requirements of Idaho's Wastewater Rules (IDAPA 58.01.16.480 and 650). The 503 regulations are self-implementing, and facilities must comply with them whether or not a permit has been issued. Idaho's Wastewater Rules require a POTW to have the capability to process sludge accumulated on site in preparation for final disposal or reuse (IDAPA 58.01.16.480 and 58.01.16.650). Operations of these sludge processing, storage, and disposal activities must comply with the facility's sludge management plan.

The City shall maintain and update their sludge management plan as needed.

8 Permit Expiration or Modification

The permit will expire five years after the effective date.

DEQ may modify a permit before its expiration date only for causes specified in IDAPA58.01.25.201. A modification other than a minor modification requires preparing a draft permit that incorporates the proposed changes, preparing a fact sheet, and conducting a public review period. Only the permit conditions subject to the modification will be reopened when a permit is modified. All other conditions of the existing permit remain in effect. Modifying a permit does not change the expiration date of the original permit.

9 References for Text and Appendices

Brooks, E.; R. Sánchez-Murillo R, J. Boll. 2011. *Ecological Assessment of Current Impacts and Future Management of the City of Troy Waste Water Treatment Plant on Steelhead (Oncorhynchus Mykiss) Habitat in the West Fork Little Bear Creek Drainage.* University of Idaho : Submitted to Idaho Governor's Office of Species Conservation. June 2011.

DEQ. 2008. *Potlatch River Subbasin Assessment and TMDLs.* Idaho Department of Environmental Quality. Lewiston Regional Office. September 2008.

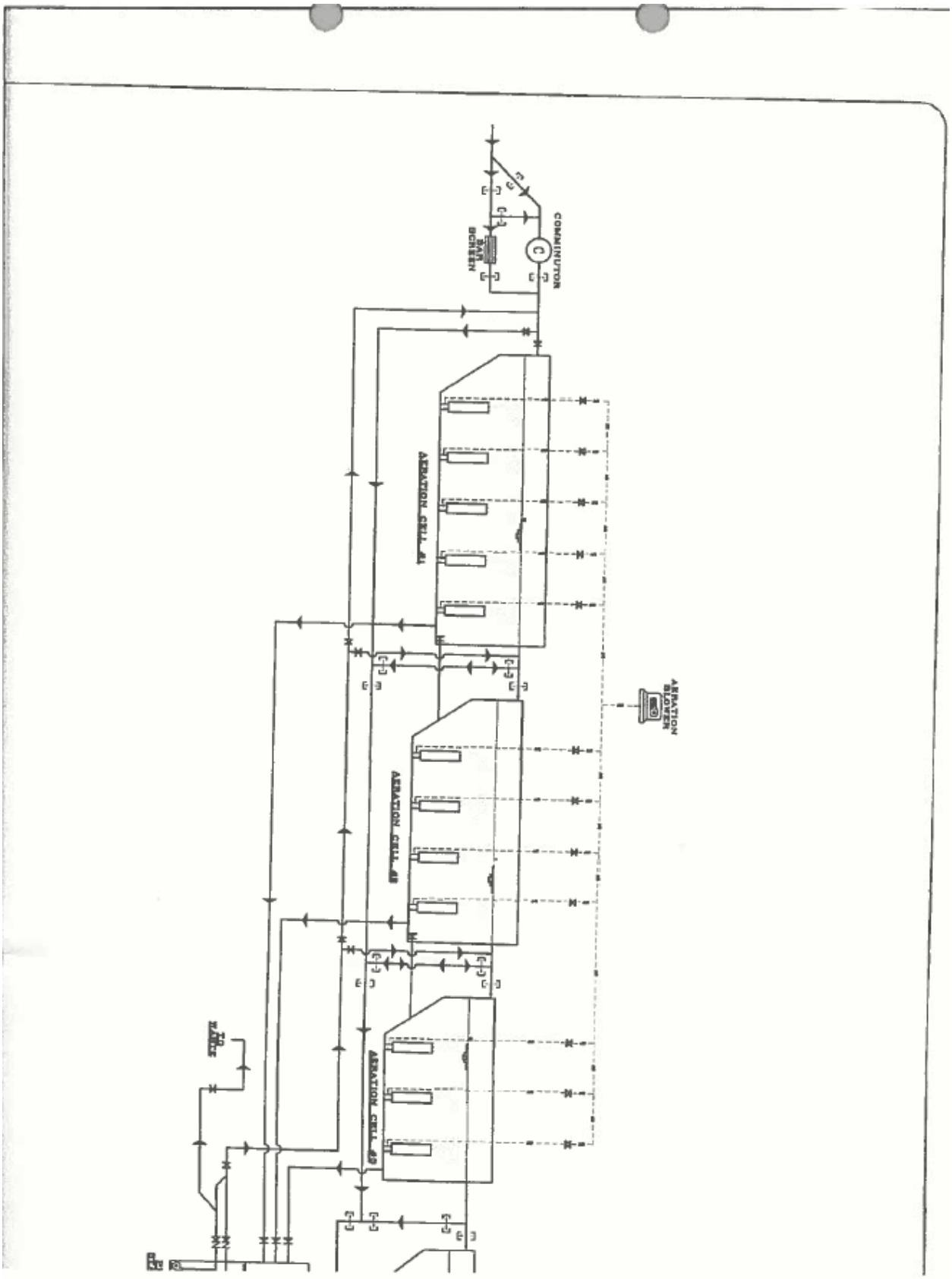
DEQ. 2017. *Effluent Limit Development Guidance*. Idaho Department of Environmental Quality. State Office. December 2017.

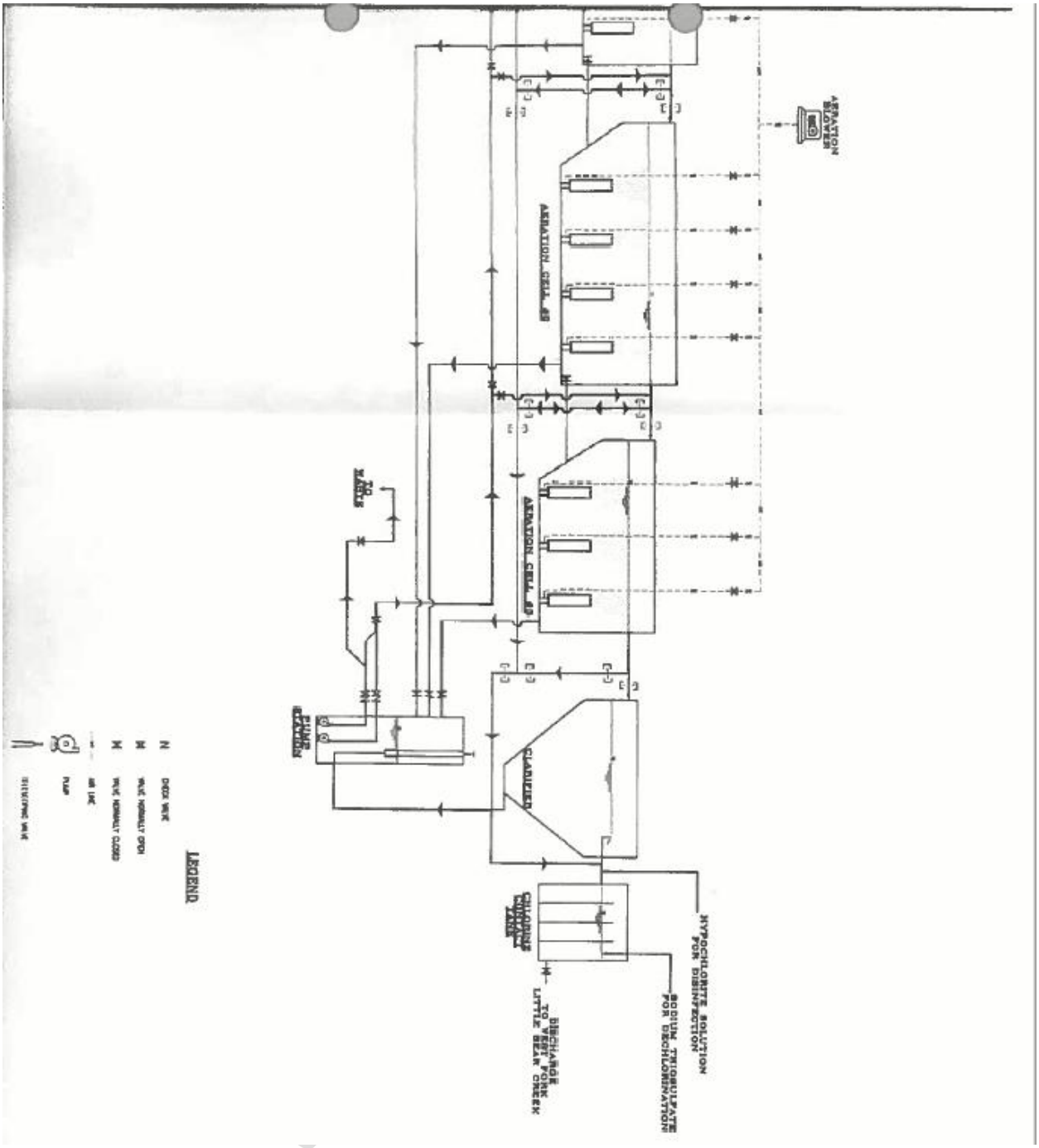
DEQ. 2018. *Potlatch River Watershed Assessment and Total Maximum Daily Loads: 2017 Temperature TMDL.* Idaho Department of Environmental Quality. State Office. April 2018.

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Appendix A. Facility Maps/Process Schematics




COMMINUTOR
AERATION BLOWER
AERATION CELL #1
AERATION CELL #2
AERATION CELL #3


AERATION BLOWER
AERATION CELL #3
AERATION CELL #2
CLARIFIER
HYPOCHLORITE SOLUTION FOR DISINFECTION
SODIUM THIOSULFATE FOR DECHLORINATION
DISCHARGE TO WEST FORK LITTLE BEAR CREEK
LEGEND
PUMP

Appendix B. Technical Calculations

The results of the calculations are discussed in sections 3.2 and 3.3 of the fact sheet.

A. Technology-Based 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 concentration and removal rate limits for BOD_5 and TSS are the technology-based effluent limits of 40 CFR 133.102. As explained below, DEQ has determined that more stringent WQBELs are necessary for pH, as well as E. coli, TRC, and ammonia, in order to ensure compliance with WQS.

B. Reasonable Potential and Water Quality-Based Effluent Limit Calculations

DEQ uses the process in the *Effluent Limit Development Guidance* (DEQ 2017) to determine reasonable potential. To determine if there is reasonable potential for the discharge to cause or contribute to an exceedance of WQC for a given pollutant, DEQ compares the critical receiving water concentration to the WQC for that pollutant. If the projected receiving water concentration exceeds the criteria, there is reasonable potential. DEQ may choose to implement a mixing zone with enhanced effluent monitoring requirements, or establish a WQBEL with or without an associated mixing zone. A mixing zone will not be established if the receiving water lacks assimilative capacity for the POC. This following section discusses how the maximum projected receiving water concentration is determined.

Mass-Balance

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

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

Equation 1. Simple mass-balance equation.

Where:

C_d = downstream receiving water concentration	Calculated value
Q_e = critical effluent flow	From discharge flow data (design flow for POTW)
Q_u = critical upstream flow (1Q10 acute criterion, 7Q10 chronic, or harmonic mean)	From water quality standards
%MZ = percent of critical low flow provided by	From mixing zone analysis

mixing zone
C_u = critical upstream pollutant concentration (90th to 95th percentile) From receiving water data
C_e = critical effluent pollutant concentration Calculated value using

A dilution factor (D) can be introduced to describe the allowable mixing. A dilution factor represents the ratio of the receiving water body low flow percentage (i.e., the low-flow design discharge conditions) to the effluent discharge volume and is expressed as:

$$Dilution\ Factor = D_f = \frac{(Q_S \times P + Q_e)}{Q_e} = \frac{(Q_s \times P)}{Q_e} + 1$$

Equation 2. Dilution factor calculation.

Where: D_f = Dilution factor
Qs = Receiving water low-flow condition (cfs)
P = Mixing zone percentage
Qe = Effluent discharge flow (cfs)

The above equations for C_d are the forms of the mass-balance equation, which were used to determine reasonable potential and calculate WLAs.

Critical Effluent Pollutant Concentration
When determining the projected receiving water concentration downstream of the effluent discharge, DEQ's *Effluent Limit Development Guidance* (DEQ 2017) recommends using the critical effluent pollutant concentration (C_e) in the mass balance calculation (see Equation 1). To determine the C_e DEQ has adopted EPA's statistical approach that accounts for day-to-day variability in effluent quality by identifying the number of samples, calculating the coefficient of variation (CV) (Equation 7, below), and selecting a reasonable potential multiplying factor (RPMF) from the tables in the *Effluent Limit Development Guidance* (DEQ 2017).

$$CV = \frac{Standard\ Deviation}{Mean}$$

Equation 3. CV calculation.

$$C_e = MOEC\ x\ RPMF$$

Equation 4. C_e calculation.

If the C_e exceeds water quality criteria then a reasonable potential analysis is conducted.

Reasonable Potential Analysis
The discharge has reasonable potential to cause or contribute to an exceedance of WQC, referred to as a reasonable potential to exceed (RPTE), if the critical concentration of the pollutant at the end of pipe exceeds the most stringent WQC for that pollutant. This RPTE may result in end-of-pipe limits or may be accommodated if the receiving water has sufficient low flows to provide a mixing zone and the POC does not have acute toxicity attributes. Other conditions may also be applicable that may restrict the use of a mixing zone for the POC.

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C. WQBEL Calculations

The following calculations demonstrate how the WQBELs in the draft permit were calculated. The draft permit includes WQBELs for TRC and Ammonia. The following discussion presents the general equations used to calculate the WQBELs.

Calculate the Wasteload Allocations (WLAs)

WLAs are calculated using the same mass-balance equations used to calculate the concentration of the pollutant at the mixing zone boundary in the RPA. WLAs must be calculated for both acute and chronic criteria. To calculate the WLAs, C_d is set equal to the appropriate criterion and the equation is solved for C_e. The calculated C_e is the WLA. Equation 9 is rearranged to solve for the WLA:

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

Equation 5. Simple mass-balance equation for calculating WLA for flowing water.

Where:

$WQC_{(a\ or\ c)}$ = Pollutant water quality criterion (acute or chronic)	Calculated value
Q_e = Critical effluent flow	From discharge flow data (design flow for POTW)
Q_u = Critical upstream flow (1Q10 acute criterion or 7Q10 chronic)	From water quality standards
%MZ = Percent of critical low flow provided by mixing zone	From mixing zone analysis
C_u = Critical upstream pollutant concentration (90th to 95th percentile)	From receiving water data
$C_e = WLA_{(a\ or\ c)}$ = wasteload allocation (acute or chronic)	Calculated from Equation 4

Idaho's WQC for some metals are expressed as the dissolved fraction, but the rules regulating the IPDES program (IDAPA 58.01.25.303.03) and federal regulations (40 CFR 122.45(c)) require that effluent limits be expressed as total recoverable metal unless standards have been promulgated allowing limits specified in dissolved, valent, or total forms, a case-by-case basis has been established for limits specified in dissolved, valent, or total form, or all approved analytical methods for the metal inherently measure only its dissolved form. Therefore, the permit writer should calculate a WLA in total recoverable metal that will be protective of the dissolved criterion. This is accomplished by dividing the WLA expressed as dissolved by the criteria translator. As discussed in *Guidance Document on Dynamic Modeling and Translators* (EPA 1993), the criteria translator (CT) is equal to the conversion factor when site-specific translators are not available. Conversion factors for metals criteria are listed in DEQ's Water Quality Standards (WQS) at IDAPA 58.01.02.210.02. The WQS also lists several guidance documents at IDAPA 58.01.02.210.04 that are recommended for the development of site specific translators.

DRAFT

The next step is to compute the acute and chronic long-term average ($LTA_{(a\ or\ c)}$) concentrations, which will be derived from the acute and chronic WLAs. This is done using the following equations from the *Effluent Limit Development Guidance* (DEQ 2017):

$$LTA_a = WLA_a \times e^{(0.5\sigma^2 - z_{99}\sigma)}$$ **Equation 6. Acute LTA for toxics.**

Where:

LTA_a = Acute long-term average	Calculated value
WLA_a = Acute wasteload allocation	Calculated value. See Equation 5.
e = Base of natural log	Approximately 2.718
σ = Square root of σ^2	
$\sigma^2 = Ln(CV^2+1)$	Ln is the natural log
CV = Coefficient of variation	Calculated using field data. If 10 or less samples available, use default value of 0.6. See Equation 3
Z_{99} = z score of the 99th percentile of the normal distribution	2.326

$$LTA_c = WLA_c \times e^{(0.5\sigma_n^2 - z_{99}\sigma_n)}$$ **Equation 7. Chronic LTA average for toxics.**

Where:

LTA_c = Chronic long-term average	Calculated value
WLA_c = Chronic wasteload allocation	Calculated value. See Equation 5.
e = Base of natural log	Approximately 2.718
σ_n = Square root of σ_n^2	
$\sigma_n^2 = Ln[(CV^2)/n + 1)]$	Ln is the natural log
CV = Coefficient of variation	Calculated using field data. If 10 or less, samples available use default value of 0.6. See Equation 3.
Z_{99} = z score of the 99th percentile of the normal distribution	2.326
n = Averaging period for the chronic water quality criterion (typically 4 days)	Varies

The acute and chronic LTAs are compared, and the more stringent of the two is used to calculate the maximum daily and average monthly limits.

Derive the Maximum Daily and Average Monthly Effluent Limits

Using the *Effluent Limit Development Guidance* (DEQ 2017) equations, the maximum daily limit (MDL) and average monthly limit (AML) are calculated as follows:

$$Maximum\ Daily\ Limit = LTA_m \times e^{(z_{99}\sigma - 0.5\sigma^2)}$$ **Equation 8. Maximum daily limit for toxics.**

Where:

LTA_m = Minimum long-term average value	Lesser value calculated from Equation 6 and Equation 7
e = Base of natural log	Approximately 2.718

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σ = Square root of σ^2	
$\sigma^2 = Ln(CV^2+1)$	Ln is the natural log of base e
Z_{99} = z score of the 99th percentile of the normal distribution	2.326
CV = Coefficient of variation	See Equation 3.

$$AML = LTA_m \times e^{(z_{95}\sigma_n - 0.5\sigma_n^2)}$$

Equation 9. Average monthly limit for toxics.

Where:

LTA_m = Minimum long-term average	Lesser value calculated from Equation 6 and Equation 7
AML = Average monthly limit	Calculated value
e = Base of natural log	Approximately 2.718
σ_n = Square root of σ_n^2	
$\sigma_n^2 = Ln[(CV^2)/n + 1]$	Ln is the natural log of base e
Z_{95} = z score of the 95th percentile of the normal distribution	1.645
n = Number of sample specified in the permit to be analyzed each month	Typically n = 1, 2, 4, 10, or 30.
CV = Coefficient of variation	See Equation 3

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Reasonable Potential Analysis (RPA) and Water Quality Effluent Limit (WQBEL) Calculations

Facility Name	City of Troy
Facility Flow (mgd)	0.1900
Facility Flow (cfs)	0.29393

Critical River Flows

	(IDAPA 58.01.02 03. b)	Annual Crit. Flows	Units
Aquatic Life - Acute Criteria - Criterion Max. Concentration (CMC)	**1Q10**	0.45400	cfs
Aquatic Life - Chronic Criteria - Criterion Continuous Concentration (CCC)	**7Q10 or 4B3**	0.63000	cfs
Ammonia	**30B3/30Q10** (seasonal)		cfs
Human Health - Non-Carcinogen	**30Q5**	0.97300	cfs
Human Health - carcinogen	**Harmonic Mean Flow**		cfs

Receiving Water Data

		Notes:	Annual	
Hardness, as mg/L $CaCO_3$	Hardness, as mg/L $CaCO_3$	5th prctile at critical flow		min. hardness 25 mg/L
Temperature, °C	Temperature, °C	90th - 95th percentile	20.37	
pH, S.U.	pH, S.U.	90th - 95th percentile	8.034	

Pollutants of Concern			AMMONIA, default: cold water, fish early life stages	CHLORINE (Total Residual)	NITRATE/NITRITE (N)
Effluent Data	**Number of Samples in Data Set (n)**		42	128	41
	Coefficient of Variation (CV) = Std. Dev./Mean (default CV = 0.6)		0.8667	1.83238	1.054312
	Effluent Concentration, µg/L (Max. or 95th Percentile) - (C_e)		25,000	1000	27000
	Calculated 50th prctile Effluent Conc. (when n>10), Human Health Only		50	0.1	22000
Receiving Water Statistics	**90th Percentile Conc., µg/L - (C_u)**		138	0	50
	Geometric Mean, µg/L, Human Health Criteria Only			0	54.9
Applicable Water Quality Criteria	Aquatic Life Criteria, µg/L	Acute	38,999.998	19.	--
	Aquatic Life Criteria, µg/L	Chronic	7,087.95	11.	--
	Human Health Water and Organism, µg/L		--	--	10,000.
	Human Health, Organism Only, µg/L		--	--	--
	Metals Criteria Translator, decimal (or default use Conversion Factor)	Acute		--	--
		Chronic		--	--
	Carcinogen (Y/N), Human Health Criteria Only		--	N	N
Percent River Flow	Aquatic Life - Acute	1Q10	25.0%	25.0%	eck Assimilative Capac
	Aquatic Life - Chronic	7Q10 or 4B3		25.00%	eck Assimilative Capac
		30B3 or 30Q10		--	--
	Human Health - Non-Carcinogen and Chronic Ammonia	30Q5	25.0%	--	0%
	Human Health - Carcinogen	Harmonic Mean		--	--
Calculated Dilution Factors (DF) (or enter Modeled DFs)	Aquatic Life - Acute	1Q10	1.38614636	1.38614636	--
	Aquatic Life - Chronic	7Q10 or 4B3		1.53584187	--
		30B3 or 30Q10		--	--
	Human Health - Non-Carcinogen and Chronic Ammonia	30Q5	1.82757799	--	1
	Human Health - Carcinogen	Harmonic Mean		--	--

Aquatic Life Reasonable Potential Analysis

σ	$\sigma^2=\ln(CV^2+1)$		0.749	1.213	0.865
P_n	$=(1\text{-confidence level})^{1/n}$, where confidence level =	**99%**	0.896	0.965	0.894
Multiplier (TSD p. 57)	$=\exp(z\sigma-0.5\sigma^2)/\exp[\text{normsinv}(P_n)\sigma-0.5\sigma^2]$, where	**99%**	2.2	1.9	2.5
Statistically projected critical discharge concentration (C_e)			55541	1876.53	68661.38
Predicted max. conc.(ug/L) at Edge-of-Mixing Zone		Acute	40107	1353.77	--
(note: for metals, concentration as dissolved using conversion factor as translator)		Chronic	30453	1221.82	--
Reasonable Potential to exceed Aquatic Life Criteria			**Yes**	**Yes**	**n/a**

Aquatic Life Effluent Limit Calculations

Number of Compliance Samples Expected per month (n)			4	4	
n used to calculate AML (if chronic is limiting then use min=4 or for ammonia min=30)			30	4	--
LTA Coeff. Var. (CV), decimal	(Use CV of data set or default = 0.6)		0.867	1.832	1.054
Permit Limit Coeff. Var. (CV), decimal	(Use CV from data set or default = 0.6)		0.867	1.832	1.054
Acute WLA, ug/L	C_d = (Acute Criteria x MZ_a) - C_u x (MZ_a-1)	Acute	54,006	26.3	--
Chronic WLA, ug/L	C_d = (Chronic Criteria x MZ_c) - C_u x (MZ_c-1)	Chronic	12,840	16.9	--
Long Term Ave (LTA), ug/L	WLAc x $\exp(0.5\sigma^2-z\sigma)$, Acute	**99%**	12,527	3.3	--
(99th % occurrence prob.)	WLAa x $\exp(0.5\sigma^2-z\sigma)$; ammonia n=30, Chronic	**99%**	9,017	3.7	--
Limiting LTA, ug/L	used as basis for limits calculation		9,017	3.3	--
Applicable Metals Criteria Translator (metals limits as total recoverable)				--	--
Average Monthly Limit (AML), ug/L , where % occurrence prob =		**95%**	**11,535**	**9**	**--**
Maximum Daily Limit (MDL), ug/L , where % occurrence prob =		**99%**	**38,870**	**26**	**--**
Average Monthly Limit (AML), mg/L			**11.5**	**0.009**	**--**
Maximum Daily Limit (MDL), mg/L			**38.9**	**0.026**	**--**
Average Monthly Limit (AML), lb/day			**18.278**	**0.014**	**--**
Maximum Daily Limit (MDL), lb/day			**61.594**	**0.042**	**--**

Human Health Reasonable Potential Analysis

σ	$\sigma^2=\ln(CV^2+1)$			1.213	0.865
P_n	$=(1\text{-confidence level})^{1/n}$ where confidence level =	**95%**		0.977	0.930
Multiplier	$=\exp(2.326\sigma-0.5\sigma^2)/\exp[\text{invnorm}(P_N)\sigma-0.5\sigma^2]$, prob. =	**50%**		0.089	0.280
Dilution Factor (for Human Health Criteria)				--	1.0
Max Conc. at edge of Chronic Zone, ug/L (C_d)				--	6,160.267
Reasonable Potential to exceed HH Water & Organism				**NO**	**NO**
Reasonable Potential to exceed HH Organism Only				**NO**	**NO**

Appendix C. Your Right to Appeal

Persons aggrieved, as specified in IDAPA 58.01.25.204.01.a, have a right to appeal the final permit decision to the Board of Environmental Quality. A Petition for Review must be filed with the Department's Hearing Coordinator within twenty eight (28) days after the Department serves notice of the final permit decision under IDAPA 58.01.25.107 (Decision Process).

All documents concerning actions governed by these rules must be filed with the Hearing Coordinator at the following address: Hearing Coordinator, Department of Environmental Quality, 1410 N. Hilton, Boise, ID 83706-1255. Documents may also be filed by FAX at FAX No. (208) 373-0481 or may be filed electronically. The originating party is responsible for retaining proof of filing by FAX. The documents are deemed to be filed on the date received by the Hearing Coordinator. Upon receipt of the filed document, the Hearing Coordinator will provide a conformed copy to the originating party. Additional requirements for appeals of IPDES final permit decisions can be found in IDAPA 58.01.25.204.

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Appendix D. Public Involvement and Public Comments

A. Public Involvement Information

DEQ proposes to reissue a permit to City of Troy. The permit includes wastewater discharge limits and other conditions. This fact sheet describes the facility and DEQ's reasons for requiring permit conditions.

DEQ placed a Public Notice of Application on 9/22/2021 in Moscow-Pullman Daily News to inform the public about the submitted application and to invite comment on the reissuance of this permit.

DEQ will place a Public Notice of Draft on 9/22/2021 in Moscow-Pullman Daily News to inform the public and to invite comment on the draft Idaho Pollutant Discharge Elimination System permit and fact sheet.

The notice:

- Tells where copies of the draft permit and fact sheet are available for public evaluation (a local public library, the closest regional or field office, posted on our website).
- Offers to provide the documents in an alternate format to accommodate special needs.
- Asks people to tell us how well the draft permit would protect the receiving water.
- Invites people to suggest fairer conditions, limits, and requirements for the permit.
- Invites comments on DEQ's determination of compliance with antidegradation rules.
- Urges people to submit their comments, in writing, before the end of the comment period.
- Tells how to request a public hearing about the draft IPDES permit.
- Explains the next step(s) in the permitting process.

[attach printed copy of the Public Notice and published article]

B. Public Comments and Response to Comments

[DEQ will complete this section after the public notice of draft period.]

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