Fact Sheet for IPDES Permit No. ID0025585

01/31/2020

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 Montpelier
Wastewater Treatment Facility
47 Bern Road
Montpelier, ID 83254

Public Comment Start Date:	11/06/2019
Public Comment Expiration Date:	12/06/2019
Technical Contact:	Karen Jackson, PG 208-373-0382 karen.jackson@deq.idaho.gov

Purpose of this Fact Sheet

This fact sheet explains and documents the decisions DEQ made in writing the IPDES permit for the City of Montpelier Wastewater Treatment Facility (WWTF).

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.

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Acronyms

1Q10	1 day, 10 year low flow
30Q5	30 day, 5 year low flow
7Q10	7 day, 10 year low flow
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	Department of Environmental Quality
DMR	Discharge monitoring report
ECHO	Enforcement and Compliance History Online
EPA	U.S. Environmental Protection Agency
HUC	Hydrological unit code
IDAPA	Idaho Administrative Procedures Act
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
NPDES	National Pollutant Discharge Elimination System
POC	Pollutant of concern
POTW	Publicly owned treatment works
RPA	Reasonable potential analysis
s.u.	Standard Units
TDD	Telecommunications device for the deaf
TMDL	Total Maximum Daily Load
TP	Total phosphorus
TRC	Total Residual Chlorine
TSD	Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001)

TSS	Total suspended solids
USGS	U.S. Geological Society
WLA	Wasteload allocation
WQBEL	Water quality-based effluent limit
WQC	Water quality criterion
WQS	Water quality standards
WWTF	Wastewater treatment facility
WWTP	Wastewater treatment plant

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 City of Montpelier. 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 permit and accompanying fact sheet for public evaluation before issuing an IPDES permit.

DEQ proposes to reissue the IPDES permit for the City of Montpelier. To ensure protection of water quality and human health, the permit places conditions on the types, volume, and concentrations 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 effluent limits and other conditions the facility must comply with;
- documentation supporting the 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, 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 review, compose comments, and provide them to DEQ. Persons wishing to request a public meeting for this facility's permit must do so in writing within 14 calendar days of the public notice being published that a permit has been prepared; requests for public meetings must be submitted to DEQ by 11/20/2019. 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 "*http://www.deq.idaho.gov/media/60178029/ipdes-public-participation-permitting-process-0216.pdf.*" 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 permit in response to the public comments. DEQ will include the summary and responses to comments in the final fact sheet in Appendix D of the final fact sheet. DEQ may request more information from the applicant in order to respond to public comments (IDAPA 58.01.25.109.02.h.). 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 address proposed changes and support the response to public comments. DEQ will assess the public comments in conjunction with any additional information received from the applicant and develop a proposed permit.

The Environmental Protection Agency (EPA) may take up to 90 days from the publication of public notice of the 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 period(s) on a permit, and after receipt of any comments on the proposed permit from EPA, DEQ will issue a final permit decision, the final permit, and fact sheet. All comments received will be addressed in Appendix D of the final fact sheet and any resulting changes to the permit or fact sheet documented. 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 permit holder or applicant and any person or entity who filed comments or who participated in a public meeting on the permit may file a petition for review of a permit decision as outlined in Appendix C. The petition for review must be filed with DEQ's hearing coordinator within 28 days after DEQ serves notice of the final permit decision. Any party that participated in the petition for review that is still aggrieved by the final IPDES action or determination has a right to file a petition for judicial review (IDAPA 58.01.25.204.26).

Documents are Available for Review

The 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 permit, fact sheet, and other information can also be found by visiting the DEQ website at *http://www.deq.idaho.gov/news-public-comments-events/*.

DEQ State Office
1410 N. Hilton St.
Boise, ID 83706
208-373-0502

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

Pocatello Regional Office
444 Hospital Way, #300
Pocatello, ID 83201

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 telecommunication device for the deaf (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 IPDES permit for the following entity:

Table 1. Facility information.

Permittee	City of Montpelier
Facility Physical Address	47 Bern Road Montpelier, Idaho 83254
Facility Mailing Address	840 Washington St. Montpelier, Idaho 83254
Facility Contact	Eric Hansen Operator 208.847.0824
Certifying Official	Jared Sharp Mayor 208.847.0824
Facility Location	Latitude: 42.317690° Longitude: -111.326038°
Receiving Water Name	Bear River
Outfall Location	Latitude: 42.334134° Longitude: -111.342236°
Permit Status	
Application Submittal Date	January 15, 2010
Date Application Deemed Complete	April 30, 2010

City of Montpelier owns and operates the City of Montpelier WWTF located in Montpelier, Idaho. The collection system has no combined sewers. The facility serves a resident population of 2,800 based on its permit application. There are 84 minor industries discharging to the facility.

2.1.1 Facility Information

The design flow of the facility is 0.5 mgd, however May monthly average flows can reach up to three times the design flow. The treatment process uses aerated and facultative lagoons. Details about the wastewater treatment process are provided in 2.1.2, and a map showing the location of the treatment facility and discharge are located in Appendix A. The facility is considered a minor facility.

2.1.2 Treatment Process

The city operates three lift stations in the collection system. Influent enters the facility at the headworks and proceeds through a Muffin Monster solids grinding station before entering the wet well, which contains three vertical turbine pumps. Wastewater is pumped into a series of three facultative lagoons with a total footprint of 51 acres. Cell one is aerated via three windmill-driven units. Overflow from cell 1 enters cell 2 and then cell 3, where effluent is stored until the authorized discharge period.

During the authorized discharge period, effluent is conveyed from cell 3 to a pipeline, disinfected with a 12.5% sodium hypochlorite solution, and piped approximately one mile northwest to the discharge point. The facility does not dechlorinate.

2.1.3 Permit History

The most recent permit for the facility was issued on June 1, 2005, became effective on July 1, 2005, and expired on June 30, 2010. An application for permit renewal was submitted to EPA by the permittee on January 15, 2010, and additional information was requested. EPA determined that the application was timely and complete on April 30, 2010. Therefore, pursuant to IDAPA 58.01.25.101.02, the permit was administratively extended and remains fully effective and enforceable.

2.1.4 Compliance History

DEQ conducted an inspection of the facility in September of 2016. The inspection encompassed the wastewater treatment process, records review, operation and maintenance, and the collection system. Overall, the facility was found to be well maintained and operated at the time of inspection. However, the inspector did note that the chlorine schedule of compliance requirements and quality assurance requirements of the previous permit had not been met.

Between June 1, 2005 and April 17, 2018, 86 violations were recorded and consisted of the following:

- Two (2) compliance schedule violations
- 21 effluent violations
- 63 discharge monitoring report (DMR) non-receipt violations

Additional compliance information for this facility, including compliance with other environmental statutes, is available on Enforcement and Compliance History Online (ECHO). The ECHO web address for this facility is: *https://echo.epa.gov/detailed-facility-report?fid=110010026818*.

During wetter years facility has requested permission from DEQ to discharge earlier than May 1 to prevent uncontrolled releases of sewage to the ground surface.

2.1.5 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.

2.1.6 Outfall Description

Outfall 001 is located on the eastern bank of an oxbow of the Bear River. The 2005 permit authorized continuous discharge during the months of May and October. The outfall consists of an exposed, open pipe, approximately eight inches above riprap and, during winter months, ice.

According to the operator, the pipe is not submerged during discharge months except in 2017, which was a high water year.

2.1.7 Wastewater Influent Characterization

The facility reported the concentration of influent pollutants in its DMRs, and results are characterized in Table 2. The tabulated data represent the quality of the influent received from October 2005 to October 2017.

Table 2. Wastewater influent characterization.

Parameter	Units	# of Samples	Average Value	Maximum Value	Data Source
BOD_5	mg/L	46	179	1,352	DMR
TSS	mg/L	23	125	191	DMR

2.1.8 Wastewater Effluent Characterization

The facility reported its effluent pollutant concentrations in DMRs, and the results are characterized in Table 3. The tabulated data represents the quality of the effluent discharged from October 2005 to October 2017.

Table 3. Wastewater effluent characterization.

Parameter	Units	# of Samples	Average Values	Maximum Values	Data Source
BOD_5 (monthly average)	mg/L	21	8	31	DMR
BOD_5 (weekly average)	mg/L	18	13	51	DMR
BOD_5 Percent Reduction	%	23	95	99 (84 minimum)	DMR
TSS (monthly average)	mg/L	21	7	18	DMR
TSS (weekly average)	mg/L	10	13	34	DMR
TSS Percent Reduction	%	23	93	99 (74 minimum)	DMR
TRC (monthly average)	mg/L	23	0.02	0.05	DMR
TRC (daily max)	mg/L	23	0.04	0.14	DMR
Flow (monthly average)	mgd	22[a]	0.9[a]	1.6	DMR
Flow (daily max)	mgd	23	1.1	1.8	DMR
Ammonia as N (monthly max)	mg/L	23	1.5	5.2	DMR
Inorganic Nitrogen (monthly max)	mg/L	23	1.2	4.4	DMR
Total Phosphorus as P (monthly max)	mg/L	23	1.4	2.8	DMR
DO (monthly min)	mg/L	23	7.1	11 (3.4 minimum)	DMR
E. coli (instantaneous maximum)	#/100mL	23	8	20	DMR
E. coli (monthly geometric mean)	#/100mL	23	2	6	DMR
Parameter	**Units**	**# of Samples**	**Minimum Value**	**Maximum Value**	**Data Source**
pH	standard units	46	7.2	9.7	DMR

a. An outlier of 37.3 mgd was removed from the data set. The value is believed to be a transcription error into ICIS.

2.2 Description of Receiving Water

In drafting permit conditions, DEQ must analyze the effect of the facility's discharge on the receiving water. The details of that analysis are provided later in this fact sheet. This section summarizes characteristics of the receiving water that impact that analysis.

The City of Montpelier discharges to the Bear River in the Bear Lake subbasin (HUC 16010201) Water Body Unit B-2. The outfall is approximately 15 miles north of Bear Lake and downstream from the cities of Dingle and Wardboro. At the point of discharge, the Bear River is protected for the following designated uses (IDAPA 58.01.02.160.02):

- cold water aquatic life
- salmonid spawning
- primary contact recreation

In addition, agricultural water supply, industrial water supply, aesthetics, and wildlife habitat uses apply to all waters (IDAPA 58.01.02.100).

The outfall is located in an oxbow that is 1.06 river miles downstream of the Bern Road Bridge. For more information on the outfall see 2.1.6, Outfall Description, in this document. Other nearby point sources include the JBP Dingle Facility (IDR053070) and US-30 at Montpelier (IDR1000D0). No nearby drinking water intakes exist. Potential non-point sources that are present in the watershed are agriculture, livestock grazing, and urban activities. 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 the WWTF monitoring and the USGS.

Table 4. Ambient background data

Parameter	Units	Percentile	Value
Temperature[a, b]	°C	95th [3]	22.0
pH[a, b]	Standard units	95th	8.5
Ammonia[b]	mg/L	90th	0.114
TP	mg/L	maximum	0.184

a. USGS gauge 10068500
b. Facility upstream monitoring
c. The 95th percentile was used because of the temperature and phosphorus impairment in the receiving water

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.

The EPA-approved *Bear River/Malad River Subbasin Assessment and Total Maximum Daily Load Plan for HUCs 16010102, 16010201, 16010202, 16010204* (2006) and *Addendum to the Bear River/Malad Subbasin Assessment and Total Maximum Daily Load Plan for HUCs 16010102, 16010201, 16010202, 16010204 (2013)* establishes WLAs for TP and TSS. 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 permit are set at levels that are consistent with the TMDL.

The State of Idaho's 2016 Integrated Report Section 5 (Section 303(d)) lists the Bear River, from Railroad Bridge (T14N, R45E, Sec. 21) to Alexander Reservoir, as not supporting its cold water aquatic life or salmonid spawning beneficial uses due to low flow alterations, water temperature, TP, and TSS. The Bear River is fully supporting its primary contact recreation use.

A TMDL for TSS and TP was published in March 2006, with an addendum published in July of 2011 and revised in February of 2013. The TMDL addendum wasteload allocations (WLAs) for TP and TSS from the July 2011 addendum are outlined in Table 5 below.

Table 5. TMDL Annual WLAs for City of Montpelier WWTF

Parameter	Units	Annual WLA
Phosphorus	lb/year	602
TSS	lb/year	14,969[a]

a. TSS TMDL WLA is expressed as 6,790 kg/year.

2.2.2 Critical Conditions

The low flow conditions of a water body are used to determine WQBELs. In general, Idaho's WQS require criteria be evaluated at the low flow design conditions defined in Table 6 (see IDAPA 58.01.02.210.03). The 1Q10 represents the lowest one-day flow with an average recurrence frequency of once in 10 years, while the 1B3 is biologically based and indicates an allowable exceedance of once every three years. The 7Q10 represents lowest average consecutive seven-day flow with an average recurrence frequency of once in 10 years, while the 4B3 is biologically based and indicates an allowable exceedance for four consecutive days once every three years. The 30Q5 represents the lowest average consecutive 30-day flow with an average recurrence frequency of once in five years. The harmonic mean is a long-term mean flow value calculated by dividing the number of daily flow measurements by the sum of the reciprocals of the flows. The 30Q10 represents the lowest average consecutive 30-day flow with an average recurrence frequency of once in 10 years. 30B3 is the biologically-based design flow intended to ensure an excursion frequency of less than once every three years for a 30-day average flow.

Critical low flows for the receiving water are summarized in Table 6.

Table 6. Critical Flows in Receiving Water

		May	October
Acute aquatic life	1Q10	85.4 cfs	34.5 cfs
Chronic aquatic life	7Q10	107 cfs	36.4 cfs
Ammonia (chronic)	30Q5	267 cfs	74.3 cfs

An active USGS gauge is located approximately eight miles upstream from the discharge (USGS 10068500 Bear River at Pescadero). Daily discharge data are available from this gauge beginning in January 1922. In addition, flow data from this gauge were used to develop the TMDL for TP and TSS. Therefore, DEQ determined that this gauge's data was suitable for calculating low flows. The Bear River was diverted to Bear Lake from Stewart Dam via the Rainbow Canal beginning in 1918; therefore, all data from the Pescadero gauge were used in the calculations for low flow.

Gauge data were pulled from January 1, 1922 through April 16, 2008. Provisional data, which may be inaccurate due to instrument malfunctions or physical changes at the measurement site, were removed, and the dataset was run through DFLOW for the proposed discharge months of May and October (EPA, 2019).

2.3 Pollutants of Concern

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

- Have a Technology-Based Effluent Limit (TBEL)
- Have an assigned total maximum daily load (TMDL) WLA
- 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 characterize the effluent and determine POCs, DEQ evaluated all pertinent and available information such as the permit application, previous DMR data, TMDLs, the facility's industrial user surveys, and additional data provided by the facility via its contracted lab (IAS Envirochem). Pollutants of concern for this facility are:

- five-day biochemical oxygen demand (BOD_5)
- total suspended solids (TSS)
- *E. coli*
- pH
- ammonia
- total residual chlorine (TRC)
- total phosphorus (TP)
- temperature

3 Effluent Limits and Monitoring

Table 7 presents the existing effluent limits and monitoring requirements in the 2005 Permit.

Table 7. 2005 Permit – Effluent Limits and Monitoring Requirements (May & October)

Parameter	Effluent Limits				Monitoring Requirements		
	Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit	Instantaneous Maximum Limit	Sample Location	Sample Frequency[c]	Sample Type
Flow, mgd	---	---	---	---	Effluent	Continuous	Recording
BOD_5	30 mg/L	45 mg/L	---	---	Influent and Effluent	1/month	8-hour composite
	125 lb/day	187 lb/day	---	---			
TSS	30 mg/L	45 mg/L	---	---	Influent and Effluent	1/month	8-hour composite
	125 lb/day	187 lb/day	---	---			
E. coli[a,b]	126/100 mL	---	---	406/100 mL	Effluent	5/month	grab
Total Residual Chlorine[d]	0.007 mg/L	---	0.018 mg/L	---	Effluent	1/week	grab
	0.03 lb/day	---	0.075 lb/day	---			
Dissolved Oxygen	---	---	---	---	Effluent	1/month	grab
Total Phosphorus, mg/L	---	---	---	---	Effluent	1/month	8-hour composite
Total Inorganic Nitrogen, mg/L	---	---	---	---	Effluent	1/month	8-hour composite
Total Ammonia as N, mg/L	---	---	---	---	Effluent	1/month	8-hour composite

a. The average monthly *E. coli* count 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.
b. Reporting is required within 24 hours of a maximum daily limit or instantaneous maximum limit violation.
c. Monitoring frequency applies when facility is discharging. Sampling not required when facility is land applying effluent.
d. 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 0.42 lbs/day.

Other effluent limits in the 2005 permit include:

1. The pH range shall be between 6.5 - 9.0 standard units. The Permittee shall monitor for pH once per week. Sample analysis shall be conducted on a grab sample from the effluent.

2. There shall be no discharge of floating solids, visible foam in other than trace amounts, or oily wastes that produce a sheen on the surface of the receiving water.

3. 85% Removal Requirements for BOD5 and TSS: For each month, the monthly average effluent concentration shall not exceed 15 percent of the monthly average influent concentration.

Table 8 presents the proposed effluent limits and monitoring requirements in the permit.

Table 8. 2020 Permit - Effluent Limits and Monitoring Requirements (May and October)

Parameter	Discharge Period	Units	Effluent Limits						Monitoring Requirements		Reporting Frequency (DMR Months)
			Average Monthly	Average Weekly	Monthly Geometric Mean	Instan-taneous Minimum	Instan-taneous Maximum	Daily Maximum	Sample Type	Sample Frequency	
Biochemical Oxygen Demand (BOD_5)[a]	05/01 to 05/31	mg/L	30	45	—	—	—	—	Grab[b]	2/month	Monthly (May and October)
		lb/day	125	187	—	—	—	—	Calculation[c]		
	10/01 to 10/31	mg/L	30	45	—	—	—	—	Grab[b]		
		lb/day	125	187	—	—	—	—	Calculation[c]		
BOD_5 Percent Removal	05/01 to 05/31	%	85 (minimum)	—	—	—	—	—	Calculation[d]	1/month	
	10/01 to 10/31										
Total Suspended Solids (TSS)[e]	05/01 to 05/31	mg/L	30	45	—	—	—	—	Grab[b]	2/month	Monthly (May and October)
		lb/day	95	187	—	—	—	—	Calculation[c]		
	10/01 to 10/31	mg/L	30	45	—	—	—	—	Grab[b]		
		lb/day	95	187	—	—	—	—	Calculation[c]		
Total Suspended Solids (TSS)[e]	05/01 to 05/31 and 10/01 to 10/31	lb/day	Seasonal Average Limit: 41						Calculation[c]	2/month	Annually (October)
TSS Percent Removal	05/01 to 05/31	%	85 (minimum)	—	—	—	—	—	Calculation[d]	2/month	Monthly (May and October)
	10/01 to 10/31										
E. coli[f, g]	05/01 to 05/31	#/100 mL	—	—	126	—	—	—	Grab[b]	5/month	Monthly (May and October)
	10/01 to 10/31										
pH[h]	05/01 to 05/31	std. units	—	—	—	6.5	9.0	—	Grab[b, i]	1/week	Monthly (May and October)
	10/01 to 10/31										
Total Ammonia as N[h]	10/01 to 10/31	mg/L	7.0	—	—	—	29	—	Grab[b]	1/week	Monthly (October)
		lb/day	29	—	—	—	120	—	Calculation[c]		

Parameter	Discharge Period	Units	Effluent Limits						Monitoring Requirements		Reporting Frequency (DMR Months)
			Average Monthly	Average Weekly	Monthly Geometric Mean	Instan-taneous Minimum	Instan-taneous Maximum	Daily Maximum	Sample Type	Sample Frequency	
Total Phosphorus as P [e]	05/01 to 05/31	mg/L	Monitor	—	—	—	—	—	Grab[b]	2/month	Monthly (May and October)
		lb/day	16.1	—	—	—	—	—	Calculation[c]		
	10/01 to 10/31	mg/L	Monitor	—	—	—	—	—	Grab[b]		
		lb/day	16.1	—	—	—	—	—	Calculation[c]		
Total Phosphorus as P [e]	05/01 to 05/31 and 10/01 to 10/31	lb/day	9.71						Calculation[c]	2/month	Annually (October)

a. Take effluent samples for the BOD_5 analysis before or after the disinfection process. If taken after, dechlorinate and resubmit the sample.
b. Grab means an individual sample collected over a fifteen (15) minute, or less, period.
c. Calculated 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
d. % Removal= ([Influent](mg/L)-[Effluent](mg/L))/([Influent](mg/L))×100%
Braces "[ ]" indicate concentration of the attribute contained inside
Calculate the percent (%) removal of BOD5 and TSS using the above equation.
e. A seasonal load limit has been specified in the permit.
f. The average monthly *E. coli* bacteria counts must not exceed a geometric mean of 126 #/100 ml based on a minimum of five samples taken every 3 – 7 days within a calendar month.
g. Idaho's water quality standards for primary contact recreation include a single sample value of 406 #/100 ml. Exceedance of this value indicates likely exceedance of the 126 #/100 ml average monthly effluent limit. If this value is exceeded at any point within the month, the facility should consider collecting more than the 5 samples per month required in this permit to determine compliance with the monthly geometric mean according to IDAPA 58.01.02.251.01.a.
h. Exceedance of a maximum daily limit, instantaneous maximum limit, or instantaneous minimum limit for this parameter requires 24-hour reporting in accordance with 2.2.7. For *E. coli*, the maximum daily threshold that triggers 24-hour reporting is 406 #/100mL. Please see 2.2.7 for additional 24-hour reporting requirements.
i. pH grab sampling must occur when the effluent is at or near its daily maximum temperature, which usually occurs in the late afternoon.

3.1 Basis for Effluent Limits

In general, the Clean Water Act (CWA) requires that the effluent limits for a particular pollutant be the more stringent of either TBELs or WQBELs. TBELs are set by EPA according to the level of treatment that is achievable using available technology. TBELs 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 Surface Water Quality Standards (IDAPA 58.1.02) 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 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 (40 CFR 133.102)

Parameter	30-day average	7-day average
BOD_5	30 mg/L	45 mg/L
TSS	30 mg/L	45 mg/L
Removal for BOD_5 and TSS (concentration)	85% (minimum)	---
pH	within the limits of 6.0 - 9.0 s.u.	

3.2.1 Mass-Based Limits

IDAPA 58.01.25.303.06 requires that effluent limits be expressed in terms of mass, except under certain conditions. IDAPA 58.01.25.303.02 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 (lb/day) and are calculated as follows:

$$\textit{Mass-based limit (lb/day)} = \textit{concentration limit (mg/L)} \times \textit{design flow (mgd)} \times 8.34^{1}$$

Equation 1. Mass-based limit calculation.

BOD_5

Since the design flow for this facility is 0.5 mgd, the technology-based mass limits for BOD_5 are calculated as follows:

[1] 8.34 is a conversion factor with units (lb ×L)/(mg × (10^6 gallon))

Average Monthly Limit = 30 mg/L × 0.5 mgd × 8.34 = 130 lb/day

Average Weekly Limit = 45 mg/L × 0.5 mgd × 8.34 = 190 lb/day

Because of backsliding the average monthly limit of 125 lb/day and average weekly limit of 187 lb/day are retained from the previous permit (see section 3.6.2).

TSS

The concentration and removal rate limits for TSS are the TBELs from 40 CFR 133.102. However, the mass limits required to maintain consistency with the WLA in the Bear River TMDL for TSS must be compared to the TBELs (see section 3.3.3.6).

Average Monthly Limit = 30 mg/L × 0.5 mgd × 8.34 = 130 lb/day

Average Weekly Limit = 45 mg/L × 0.5 mgd × 8.34 = 190 lb/day

Because of backsliding the average monthly limit of 125 lb/day and average weekly limit of 187 lb/day from the previous permit are used in the table below.

Table 10. Comparison of TSS TBELs and WQBELs

Parameter	Average Monthly Limit (lb/day)	Average Weekly Limit (lb/day)
TBEL	125	187
TMDL WLA WQBEL	95	270
Most Stringent	95	187

3.3 Water Quality-Based Effluent Limits

3.3.1 Statutory and Regulatory Basis

Section 301(b)(1)(C) of the 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 WQS, including narrative criteria for water quality. Effluent limits must also meet the applicable water quality requirements of affected States and tribes other than the State in which the discharge originates, which may include downstream States or tribes (IDAPA 58.01.25.103.03, 58.01.25.302.06).

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

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

DEQ uses the process described in the *Effluent Limit Development Guidance* (DEQ 2017) to determine whether there is reasonable potential for the discharge to cause or contribute to an exceedance of water quality criteria (WQC). To determine if there is reasonable potential 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 proposed mixing zones for this facility's pollutants are summarized in Table 11. DEQ also calculated dilution factors for monthly critical low flow conditions. All dilution factors are calculated with the effluent flow rate set equal to the design flow of 0.5 mgd.

Table 11. Authorized mixing zones.

Pollutant	Discharge Period	Aquatic Life		Authorized Mixing Zone
		Acute (1Q10)	Chronic (7Q10)	
Ammonia	May	85.4	267[a]	13%
Chlorine	May	85.4	107	7%
Ammonia	October	34.5	74.3[a]	25%
Chlorine	October	34.5	36.4	17%

a. The chronic critical flow for ammonia is the 30Q5.

The reasonable potential analysis (RPA) and WQBEL calculations were based on mixing zones shown in Table 11. If DEQ revises the allowable mixing zones before final issuance of the permit, the RPA and WQBEL calculations will be revised accordingly.

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 12. Ammonia criteria - May.

Total ammonia nitrogen criteria (mg N/L):
Seasonal Basis - Season 1
Based on IDAPA 58.01.02

INPUT	
1. Receiving Water Temperature (deg C):	21.6
2. Receiving Water pH:	8.50
3. Is the receiving water a cold water designated use?	Yes
4. Are non-salmonid early life stages present or absent?	Present
OUTPUT	
Total ammonia nitrogen criteria (mg N/L):	
Acute Criterion (CMC)	**2.14**
Chronic Criterion (CCC)	**0.69**

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

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

Table 13. Ammonia criteria - October.

Total ammonia nitrogen criteria (mg N/L):
Seasonal Basis - Season 2
Based on IDAPA 58.01.02

INPUT	
1. Receiving Water Temperature (deg C):	21.5
2. Receiving Water pH:	8.27
3. Is the receiving water a cold water designated use?	Yes
4. Are non-salmonid early life stages present or absent?	Present
OUTPUT	
Total ammonia nitrogen criteria (mg N/L):	
Acute Criterion (CMC)	**3.37**
Chronic Criterion (CCC)	**1.03**

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 showed that the facility's discharge would have the reasonable potential to cause or contribute to a violation of the WQC for ammonia in May and October; therefore, the permit contains a WQBEL for ammonia for this time period. The permit requires that the permittee monitor the receiving water for ammonia, pH, and temperature to determine the applicable ammonia criteria for the next permit reissuance.

See Appendix B for reasonable potential and effluent limit calculations for ammonia.

DEQ's *Effluent Limit Development Guidance* 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 Bear River is impaired for temperature and phosphorus, DEQ determined that the 95th percentile temperature and pH were appropriate for the ammonia calculation.

3.3.3.2 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 not have the reasonable potential to cause or contribute to a violation of the chlorine WQC. The RPA in the previous permit assumed critical low flows of 0 cfs, which is not an appropriate assumption for the Bear River. Chlorine is still added to effluent as part of the treatment process, however the limit has been removed. See Appendix B for the RPA calculations for chlorine, section 3.6.3 for antibacksliding analysis on chlorine and changes made since the 2005 RPA, and section 3 for effluent monitoring requirements for chlorine.

3.3.3.3 E. coli

The Idaho WQS states 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. Since a mixing zone is not appropriate, an RPA was not conducted and end-of-pipe limits are included in this permit. There are no TBELs for fecal coliform or *E. coli*, therefore, the permit contains a monthly geometric mean WQBEL 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).

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

When a single sample maximum is exceeded, additional samples should be taken to assess compliance with the geometric mean criterion. Monitoring of the effluent five times per month ensures 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 58.01.25.010.06 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. Therefore, the permit monthly effluent limit is a geometric mean for *E. coli* of 126 organisms per 100 ml.

3.3.3.4 pH

The Idaho WQS at IDAPA 58.01.02.250.01.a requires 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. pH data from the facility indicated two instances of pH above the WQC of 9.0 in October 2006 and May

2007. The remaining data up to the time of the 2016 site visit indicated compliance with the WQC.

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.

The Bear River is impaired for TP, and the Bear River TMDL (DEQ 2006) and Bear River TMDL addendum (DEQ 2011, revised 2013) prescribes an annual WLA of 602 lb/year and 1.65 lb/day for the City of Montpelier.

The TMDL annual load published in the 2011was developed using data collected between 2006 and 2009. The annual load was developed using a mean value for effluent TP (1.24 mg/L) and an averaged flow value (1.995 cfs/1.29 MGD). The TMDL took into consideration the discharge season. Usually the season is two months, but during TMDL development the permittee only discharged 30 days during 2008 and 2009. The mean discharge period at the time of TMDL development was 45 days[2].

$$\frac{1.24\ mg}{1\ L} \times \frac{1.29\ mil\ gal}{1\ day} \times \frac{8.34\ lb}{gallon} = 13.36 \frac{lb}{day}$$

$$\frac{13.36\ lb}{1\ day} \times \frac{45\ days}{1\ year} = 601.2 \frac{lb}{year}$$

The 2011 TMDL addendum takes into account the discharge is not year-round, nevertheless had divided the annual load by 365 days in the event that the permittee could someday expand their discharge season. This calculation derives the 1.65 lb/day seen in the 2011 TMDL addendum (602 lb/year ÷365 days = 1.65 lb/day). This permit does not expand the discharge season, thus the daily loads are calculated to be as follows:

$$\frac{602\ lb}{1\ year} \times \frac{1\ year}{62\ days\ of\ discharge} = 9.71 \frac{lb}{day}$$

The daily load of 9.7 lb/day was used to calculate an average monthly concentration limit for the nutrient (see Table 28). This limit ensures that the annual loading of TP will not exceed the annual load of 602 lb/year.

3.3.3.6 Total Suspended Solids

The Bear River is impaired for TSS. The Bear River TMDL (Table 1-3, page 16, DEQ 2006) prescribes an annual average WLA of 14,969 lb/year (6,790 kg), or 41 lb/day (Table 14, page 31, DEQ 2013), for the City of Montpelier. There is a low probability that the facility could exceed

[2] (60 days + 60 days + 30 days + 30 days)/4 years = 45 days/year

its annual average load allocation while still meeting its maximum daily concentration limit. To address this and ensure that DEQ has included a seasonal limit for the annual allocation prescribed in the TMDL. This limit directly ensures that the annual loading of TSS will not exceed the annual load of 14,969 lb (6,790 kg).

The TBELs for concentration and removal rate for TSS are the TBELs from 40 CFR 133.102 and have been included in the permit. The permit must consider mass limits derived from the TMDL and compare the mass limits to technology based mass limits. The text below demonstrates the TBELs are more stringent, and thus are the limits used in the permit.

In translating the TMDL WLA into permit limits, the ELDG and TSD procedures were followed. The first step in developing limits is to determine the time frame over which the WLAs apply. The Bear River TMDL expresses the WLA as an annual load (lb/year). The TSS WLA can be expressed as an annual average load using the following calculation:

$$\frac{14{,}969\ lb}{1\ year} \times \frac{1\ year}{365\ days} = 41\,\frac{lb}{day}$$

This number is incorporated directly into the permit as a seasonal average limit (for discharge in May and October).

The NPDES regulations at 40 CFR §122.45(d) require that permit limits for POTWs be expressed as average monthly limits (AMLs) and average weekly limits (AWLs), unless impracticable. The WLA must be statistically converted to an AML and AWL (also see Table 29 in Appendix B).

<u>Calculating AML</u>:
The AML can be calculated by setting the annual average equal to the chronic Long Term Average (LTA_c).
TSS TMDL WLA = LTA = 41 lb/day

$$AML = LTA_m \times e^{\left(z_{95}\sigma_n - 0.5\sigma_n^2\right)}$$ *(from Equation 37 of the ELDG)*

Where:

CV = coefficient of variation = 0.997 (based on facility data from Oct 2005 - Oct 2017)
n = 2 (number of samples in a month)
σ_2^2 = ln(CV^2/n +1) = ln(0.997^2/2 +1) = 0.403
σ_2 = 0.635
Z = percentile exceedance probability for AML (95%) = 1.645
AML = 41 × exp[(1.645 × 0.635) - (0.5 × 0.403)]
AML = 41 × 2.32 = 95 lb/day

<u>Calculating the AWL</u>:
The AWL is calculated by multiplying the AML by the following relationship (from Table 5-3 of the TSD):

$$\text{AWL} = AML \times \frac{e^{\left[Z_{AWL}\times\sigma_{\frac{n}{4}} - 0.5\times\sigma_{n/4}^2\right]}}{e^{\left[Z_{AML}\times\sigma_n - 0.5\times\sigma_n^2\right]}}$$

Where:

CV = coefficient of variation = 0.997 (based on facility data from Oct 2005 - Oct 2017)
σ_2^2 = ln(CV^2/n +1) = ln(0.997^2/2 +1) = 0.403
σ_2 = 0.635
Z = percentile exceedance probability for AML (95%) = 1.645
n/4 = number of samples per week = 0.5
$\sigma_{n/4}^2$ = ln(CV^2/(n/4) +1) = ln(0.997^2/(2/4) +1) = 1.094
$\sigma_{n/4}$ = 1.046

Z_{AWL} = percentile exceedance probability for AWL (99%) = 2.326
Z_{AML} = percentile exceedance probability for AML (95%) = 1.645

$$AWL = 95 \times \frac{\exp[(2.326 \times 1.046) - (0.5 \times 1.094)]}{\exp[(1.645 \times 0.635) - (0.5 \times 0.403)]}$$

AWL = 95 × 2.84
AWL = 270 lb/day

Limits derived from TBELs:

Average Monthly Limit = 30 mg/L × 0.5 mgd × 8.34 = 125 lb/day

Average Weekly Limit = 45 mg/L × 0.5 mgd × 8.34 = 187 lb/day

Table 14. Comparison of TSS TBELs and WQBELs

Parameter	Average Monthly Limit (lb/day)	Average Weekly Limit (lb/day)
TBEL	125	187
WQBEL	95	270
Most Stringent	95	187

Note that in the case of the average monthly limit, the WQBEL load limit is more stringent than the TBEL. The average monthly limit TBEL for TSS has a corresponding concentration limit (30 mg/L). It is important to note the TBEL concentration limit does not correspond with the load limit. The TMDL WLA load limit is the more restrictive limit.

3.4 Narrative Criteria

DEQ must consider 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 that 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 limit prohibiting the discharge of such materials or any other 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).

DEQ completed an antidegradation review for this permit and applied Tier I protection to the Bear River at the location of the outfall for cold water aquatic life, salmonid spawning, and primary contact recreation. In addition to these uses, all waters of the state are protected for agricultural and industrial water supply, wildlife habitat, and aesthetics (IDAPA 58.01.02.100). The antidegradation analysis determines consistency with the State's WQS and the State's antidegradation implementation procedures.

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 CWA, 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 water quality standards.

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 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 WLAs 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 *Bear River/Malad River Subbasin Assessment and Total Maximum Daily Load Plan for HUCs 16010102, 16010201, 16010202, 16010204* (2006) establishes WLAs for TSS and TP. The effluent limits and associated requirements contained in the proposed permit are set at levels that ensure compliance with the narrative and numeric criteria in the WQS and consistency with the WLAs established in the Bear River TMDL. Therefore, DEQ has determined the permit will protect and maintain existing and designated beneficial uses in the Bear River 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 Bear River is considered high quality for primary contact recreation. As such, the water quality relevant to contact recreation of the Bear River must be maintained and protected, unless a lowering of water quality is insignificant or is deemed necessary to accommodate important social or economic development (IDAPA 58.01.02.052.08).

To determine whether degradation will occur, DEQ must evaluate how the discharge will affect water quality for each pollutant that is relevant to primary contact recreation uses of the Bear River (IDAPA 58.01.02.052.06); these include *E. coli* and total phosphorus**.** Effluent limits for these pollutants have changed from the 2005 permit to the 2020 permit.

For a reissued permit the effect on water quality is determined by looking at the difference in water quality that would result from the activity or discharge as authorized in the 2005 permit and the water quality that would result from the activity or discharge as proposed in the reissued permit (IDAPA 58.01.02.052.06.a). For a new permit, the effect on water quality is determined by reviewing the difference between the existing receiving water quality and the water quality that would result from the activity or discharge as proposed in the new permit (IDAPA 58.01.02.052.06.a).

3.5.2.1 Pollutants with Limits in the Existing and Proposed Permit

For pollutants that are currently limited and will have limits under the reissued permit, the current discharge quality is based on the limits in the 2005 permit (IDAPA 58.01.02.052.06.a.i), and the future discharge quality is based on the 2020 permit limits (IDAPA 58.01.02.052.06.a.ii). For the City of Montpelier permit, this means determining the permit's effect on water quality based upon the limits for pollutants with limits in both 2005 permit and the 2020 permit.

Table 15 provides a summary of the 2005 permit limits and the 2020 permit limits.

Table 15. Antidegradation comparison for protection of the primary contact recreation beneficial use.

Pollutant	Units	2005 Permit		2020 Permit		Degradation[a]
		Average Monthly Limit	Single Sample Limit	Average Monthly Limit	Single Sample Limit	
Pollutants with limits in both the 2005 and 2020 permit						
E. coli	#/100 mL	126	406	126	—	Yes - I[b]
Pollutants with new limits in the 2020 permit						
Phosphorus, Total as P	lb/day	—	—	16.1	—	No

a. No = No degradation, Yes - S = Increase in pollutant load or concentration resulting in significant degradation, Yes – I = Increase in pollutant load or concentration resulting in insignificant degradation
b. See Section 3.5.2.3 below.

3.5.2.2 New Permit Limits for Pollutants Currently Discharged

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

The permit for City of Montpelier includes new limits for total phosphorus. The new limits are based on a combination of the 2017 TMDL five-year review and the facility's phosphorus removal performance.

3.5.2.3 E. coli

The reissued permit does not include the max daily limit of 406/100mL for *E.coli* that was included in the previous permit. The Idaho WQS state that a water sample exceeding the single sample maximum values indicates a likely exceedance of the geometric mean criterion, although it is not a violation of WQS by itself. For waters designated for primary contact recreation, the "single sample maximum" value is 406/100 mL (IDAPA 58.01.02.251.01.b.ii.). Removing the max daily limit does not affect the assimilative capacity of the river because the Idaho WQC for *E. coli* is a monthly geomean of 126/100mL which is retained in this permit as the limit. Because the WQC for this particular parameter is a geometric mean and not an instantaneous concentration level, the single sample maximum is only an indicator of the potential WQC and not a direct limit. DEQ concludes that removal of the instantaneous limit complies with the Tier II provisions of Idaho's WQS.

In addition, the existing discharge proposes no change in the discharge, does not affect the assimilative capacity of the river, and is therefore considered a non-degrading discharge. The resulting water quality effects comport with the state's anti-degradation policy.

3.6 Antibacksliding

Sections 402(o) and 303(d)(4) 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 but provides 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 2005 permit with the 2020 permit in Table 16 below.

Table 16. Comparison of 2005 and 2020 effluent limits.

Pollutant	Units	2005 Permit			2020 Permit			Change[a]
		Average Monthly Limit	Average Weekly Limit	Single Sample Limit	Average Monthly Limit	Average Weekly Limit	Single Sample Limit	
Pollutants with limits in both the 2005 and 2020 permit								
BOD_5	mg/L	30	45	—	30	45	—	NC
	lb/day	125	187	—	125	187	—	
	% removal	85	—	—	85	—	—	
TSS	mg/L	30	45	—	30	45	—	MS (see 3.6.7)
	lb/day	125	187	—	95	187	—	
	% removal	85	—	—	85	—	—	
pH	standard units	6.5–9.0 all times			6.5–9.0 all times			NC
E. coli	#/100 mL	126	—	406	126	—	—	LS (see 3.6.4)
Pollutants with new limits in the 2020 permit								
Total Ammonia as N MAY	mg/L	Monitor	—	—	Monitor	—	Monitor	NC
	lb/day	—	—	—	Monitor	—	Monitor	
Total Ammonia as N OCTOBER	mg/L	Monitor	—	—	7.0	—	29	MS (see 3.6.1)
	lb/day	—	—	—	29	—	120	
Total Phosphorus	mg/L	Monitor	—	—	Monitor	—	—	MS (see 3.6.6)
	lb/day	—	—	—	16.1	—	—	
New pollutants with no limits the 2020 permit								
Chlorine, Total Residual	mg/L	0.007	—	0.018	Monitor	—	Monitor	LS(see 3.6.3)
	lb/day	0.03	—	0.075	—	—	—	
Temperature	°C				—	—	Monitor	NC

[a] MS = More stringent pollutant load or concentration limit, LS = Less stringent pollutant load or concentration limit, NC = No change in pollutant load or concentration limit
[b] DEQ is replacing the fecal coliform limits with *E. coli* effluent limits. See discussion below.

An antibacksliding analysis was done for BOD_5, TSS, *E. coli*, pH, total ammonia, TP, and TRC. The analysis for each of these parameters is detailed below.

3.6.1 Ammonia

The 2005 permit did not include a limit for ammonia. The RPA indicated reasonable potential to cause or contribute to an exceedance of WQS at 25% mixing in October, and a new limit was included in the permit. Therefore, this effluent limitation is at least as stringent as the 2005 permit.

3.6.2 BOD_5

The 2005 permit included TBELs for BOD_5 at secondary treatment standard. The TBELs and design flow have not changed; therefore, this effluent limitation is at least as stringent as the 2005 permit.

3.6.3 Chlorine

The 2005 fact sheet indicates that the RPA used 0 cfs as the critical low flow because no flow data were available. The resulting WLA was set at the acute and chronic criteria for chlorine (19 µg/L and 11 µg/L respectively), and mass-based limits were calculated using the methodology outlined in section 5.2. The USGS gauge used for this permit has been online since 1922 and provided sufficient flow data to calculate critical low flows in the Bear River. Using these low flows, the RPA indicated adequate dilution at an appropriately sized mixing zone to meet WQS, and thus there is no reasonable potential to cause or contribute to an exceedance. The CWAL beneficial use receives Tier I protection, thus removing the limit is consistent with Idaho's antidegradation policy. This satisfies the antibacksliding in exception 58.01.25.200.03.c (CWA 303(d)(4)(B)), and the chlorine limit has been removed.

3.6.4 *E. coli*

The 2004 permit contains an instantaneous maximum limit (i.e., single sample limit) of 406/100 mL. This limit has been removed in the permit as per antibacksliding exception in 303(d)(4)(B) of the Clean Water Act. This limit removal is allowed under antibacksliding exceptions in IDAPA 58.01.25.200.03.c since:

- The use is attained (i.e., the receiving water is not impaired for *E. coli*); and
- The existing discharge proposes no change in the discharge and is therefore considered a non-degrading discharge. The resulting water quality effects comport with the state's anti-degradation policy (see Table 15).

3.6.5 pH

The limit for pH has not changed from the previous permit and reflects Idaho's WQS. Therefore, this effluent limitation is at least as stringent as the 2005 permit.

3.6.6 TP

The 2005 permit did not include a limit for phosphorus, and a TMDL addressing this pollutant was not approved until 2006. A limit consistent with the TMDL WLA has been included in the permit. Therefore, this effluent limit is at least as stringent as the 2005 permit.

3.6.7 TSS

The 2005 permit included TBELs for TSS at the secondary treatment standard. A TMDL addressing this pollutant was not approved until 2006. In addition to the TBEL, the proposed permit has included a more stringent WQBEL consistent with the TMDL. Therefore, this effluent limitation is at least as stringent as the 2005 permit.

4 Monitoring Requirements

Idaho regulations in 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 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 below in Table 17. Permittees have the option of taking more frequent samples than 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 17. Influent monitoring requirements

Item or Parameter	Monitoring Period	Units	Sample Frequency	Sample Type	Report	Reporting Period (DMR Months)
Flow	05/01 to 05/31 and 10/01 to 10/31	mgd	5/week	Recording	Maximum Daily, Average Monthly	Monthly (May, October)
BOD_5	05/01 to 05/31 and 10/01 to 10/31	mg/L	2/month	8-hour composite	Average Weekly, Average Monthly	Monthly (May, October)
TSS	05/01 to 05/31 and 10/01 to 10/31	mg/L	2/month	8-hour composite	Average Weekly, Average Monthly	Monthly (May, October)

4.1.1 Influent Monitoring Changes from the 2005 Permit

Changes in monitoring requirements from the 2005 permit are presented in Table 18 below.

Table 18. Changes in influent monitoring frequency from 2005 permit.

Parameter	2005 Permit	2020 Permit	Rationale
BOD_5	1/month	2/month	Under the current monitoring schedule, the permittee submits only nine samples (assuming reapplication 180 days before expiration). A larger data set allows for more confident calculations and subsequent results.
TSS	1/month	2/month	Under the current monitoring schedule, the permittee submits only nine samples (assuming reapplication 180 days before expiration). A larger data set allows for more confident calculations and ensures compliance with the TMDL WLA and seasonal average TSS load.

4.2 Additional 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 19. 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" shall be reported on the DMR.

Table 19. Additional effluent monitoring requirements.

Parameter	Monitoring Period	Units	Monthly Average	Intan-taneous Maximum	Daily Maximum	Maximum Daily Average	Sample Frequency	Sample Type	Reporting Period (DMR Months)
Total Ammonia (as N)	05/01 to 05/31	mg/L	Report	—	Report	—	1/week	Grab[a, b]	Monthly (May)
Flow	05/01 to 05/31	mgd	Report	—	Report	—	5/week	Recorded	Monthly (May, October)
	10/01 to 10/31		Report	—	Report	—			
Total Residual Chlorine (TRC)	05/01 to 05/31	mg/L	Report	—	Report	—	1/week	Grab[a]	Monthly (May, October)
	10/01 to 10/31		Report	—	Report	—			
Temperature	05/01 to 05/31	°C	Report	—	—	Report[e]	Continuous[c, d]	Recorded	Monthly (May, October)
	10/01 to 10/31		Report	—	—	Report[e]			
E. coli[f, g]	05/01 to 05/31	#/100ml	—	Report	—	—	5/month	Grab[a, b]	Monthly (May, October)
	10/01 to 10/31		—	Report	—	—			

a. Grab means an individual sample collected over a fifteen (15) minute period or less.
b. Ammonia grab sampling must be contemporaneous with pH and temperature monitoring and occur when the effluent is at or near its daily maximum temperature, which usually occurs in the late afternoon.
c. Temperature data must be recorded using DEQ-approved temperature monitoring devices set to record at one-hour or more frequent intervals. DEQ's Protocol for Placement and Retrieval of Temperature Data Loggers contains protocols for continuous temperature sampling. This document is available online at: http://www.deq.idaho.gov/media/487602-wq_monitoring_protocols_report10.pdf. Report the following temperature monitoring data on the DMR: maximum daily average and monthly average.
d. DEQ acknowledges that uninterrupted data collection is not guaranteed due to vandalism, theft, damage, disturbance, power interruption, etc. In the event of equipment failure or loss, the permittee must notify DEQ and deploy new equipment to minimize interruption of data collection. If new equipment cannot be immediately deployed, the permittee must monitor grab measurements daily between 8 a.m. and 5 p.m. or describe frequency when continuous monitoring is not possible until continuous monitoring equipment is redeployed.
e. Maximum of the daily averages for the reporting period (calendar month).
f. Idaho's water quality standards for primary contact recreation include a single sample value of 406 #/100 ml. Exceedance of this value indicates likely exceedance of the 126 #/100 ml average monthly effluent limit. If this value is exceeded at any point within the month, the facility should consider collecting more than the 5 samples per month required in this permit to determine compliance with the monthly geometric mean according to IDAPA 58.01.02.251.01.a
g. 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 2005 Permit

Monitoring frequencies for the pollutants listed in Table 20 below have been changed from the previous permit. Monitoring frequency for pH did not change.

Table 20. Changes in effluent monitoring from 2005 permit.

Parameter	2005 Permit	2020 Permit	Rationale
BOD_5	1/month	2/month	Under the current monitoring schedule, the permittee submits only nine samples (assuming reapplication 180 days before expiration). A larger data set allows for more confident calculations and subsequent results.
Dissolved oxygen	1/month	Removed	The permittee's maximum design flow is less than 1% of the 1Q10 low flow, thus the permittee's effluent DO likely has insignificant impact on the receiving water DO. Therefore, the monitoring requirement has been removed.
Temperature	—	2/week	The Bear River is impaired for temperature; however, there is currently no TMDL. Temperature monitoring has been increased in the proposed permit to determine whether the facility is contributing to the impairment of the receiving water.
Total Residual Chlorine	1/week	1/week	Frequency has not changed, however, the associated TRC limit has been removed due to new critical low flow data.
Total Ammonia	1/month	1/week	Total ammonia has been added to the permit as a new limit. Sampling of once per month results in only nine data points prior to reapplication. A larger data set allows for more confident calculations and subsequent results.
Total Inorganic Nitrogen	1/month	Removed	There are no numeric criteria for nitrate and nitrites, and the ammonia limit and monitoring requirements sufficiently address nitrogen concerns.
Total Phosphorus	—	2/month	Monitoring of twice per month ensures compliance with the TMDL WLA and seasonal average TP load.
TSS	1/month	2/month	Under the current monitoring schedule, the permittee submits only nine samples (assuming reapplication 180 days before expiration). A larger data set allows for more confident calculations and ensures compliance with the TMDL WLA and seasonal average TSS load.

4.3 Receiving Water Monitoring

In general, receiving water monitoring may be required for POCs to assess the assimilative capacity of the receiving water for the pollutant. In addition, receiving water monitoring may be required for pollutants for which the WQC are dependent and to collect data for TMDL development if the facility discharges to an impaired water body.

Table 21 presents the receiving water monitoring requirements for the permit. The facility should continue receiving water monitoring at the established location at the bridge on Bern Road, approximately 0.76 miles west of the chlorination building. Receiving water monitoring results must be submitted with the DMR.

Table 21. Receiving water monitoring requirements.

Parameter	Units	Sample Frequency	Sample Type	Report	Reporting Period
pH	Standard Units	2/month	Grab[a,b]	Instantaneous Maximum, Instantaneous Minimum	Monthly (May, October)
Temperature[c]	°C	Continuous[d,e]	Recording	Monthly Average, Maximum Daily Average	Monthly (May, October)
Total Ammonia (as N)	mg/L	2/month	Grab	Monthly Average, Daily Maximum	Monthly (May, October)
Total Phosphorus (as P)	mg/L	2/month	Grab	Monthly Average, Daily Maximum	Monthly (May, October)
E. coli	#/100ml	5/month	Grab	Instantaneous Maximum	Monthly (May, October)

a. Grab means an individual sample collected over a fifteen (15) minute, or less, period.
b. pH must be analyzed within 15 minutes of sample collection.
c. DEQ acknowledges that uninterrupted data collection is not guaranteed due to vandalism, theft, damage, disturbance, power interruption, etc. In the event of equipment failure or loss, the permittee must notify DEQ and deploy new equipment to minimize interruption of data collection. If new equipment cannot be immediately deployed, the permittee must monitor grab measurements daily between 8 a.m. and 5 p.m. or describe frequency when continuous monitoring is not possible until continuous monitoring equipment is redeployed.
d. Continuous means measurements recorded once every 60 minutes except for brief lengths of time for calibration, power failure, or unanticipated equipment repair or maintenance.
e. Temperature data must be recorded using DEQ-approved temperature monitoring devices set to record at one-hour or more frequent intervals. DEQ's Protocol for Placement and Retrieval of Temperature Data Loggers contains protocols for continuous temperature sampling. This document is available online at: *http://www.deq.idaho.gov/media/487602-wq_monitoring_protocols_report10.pdf*. Report the following temperature monitoring data on the DMR: maximum daily average and monthly average.

4.3.1 Receiving Water Monitoring Changes from the 2005 Permit

Monitoring frequencies for the pollutants listed in Table 22 have been changed from the previous permit.

Table 22. Changes in receiving water monitoring frequency from 2005 permit.

Parameter	2005 Permit	2020 Permit	Rationale
pH	[a]	1/month	The monitoring frequency of pH has been increased to align with the increased monitoring frequency of total ammonia.
Temperature	[a]	Continuous	The monitoring frequency of temperature has been increased to align with the increased monitoring frequency of total ammonia. In addition, continuous monitoring has been proposed to determine whether the facility is contributing to the impairment of the Bear River.
Total Ammonia	[a]	1/month	Total ammonia has been added to the permit as a new limit. Sampling of once per month results in only nine data points prior to reapplication. A larger data set allows for more confident calculations and subsequent results.
Total Inorganic Nitrogen	[a]	Removed	There are no numeric criteria for nitrate and nitrites, and the ammonia limit and monitoring requirements sufficiently address nitrogen concerns.
Total Phosphorus	[a]	1/month	The monitoring frequency of TP has been increased to document the state of the impairment in the Bear River.
E. coli	—	5/month	Additional upstream sampling will provide data to evaluate if the receiving water is meeting the primary contact recreation beneficial use.

a. A minimum of three (3) samples collected each year. During the months of discharge, surface water monitoring twice in May and once in October, then alternating the following year.

4.4 Permit Renewal Monitoring

The permit renewal monitoring requires data collected to characterize the effect of the effluent on the Bear River. At a minimum, three samples of the final wastewater effluent for the parameters listed in Table 23 and Table 24 are required so that DEQ can assess the surface water impacts.

DEQ has the discretion to waive a permit renewal requirement if DEQ has access to substantially identical information (IDAPA 58.01.25.105.11.b). The City of Montpelier effluent samples from lagoons has a greater than 24-hours holding time, and is substantially identical to a 24-hour composite. The 24-hour composite requirement for this facility is waived.

Table 23. Effluent monitoring required for all permit renewals.

Parameter	Units	Sample Type	Report
pH	s.u.	Grab	Minimum and maximum value
Flow	mgd	Grab	Maximum daily value, average daily value, number of samples
Temperature[a]	^{o}C	Grab	
BOD_5	mg/L	Grab	Maximum daily value, average daily value, analytical method and ML or MDL
TSS	mg/L	Grab	
E. coli	#/100 mL	Grab	

a. The permittee must collect temperature data during May or October.

The facility has a design flow greater than 0.1 MGD and must also complete three samples of effluent testing for the parameters in Table 24.

Table 24. Effluent testing required for permit renewals of facilities with flow greater than 0.1 mgd.

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

5 Special Conditions

5.1 Facility Capacity

The permit requires the City of Montpelier to update its facility plan. Because the facility is discharging up to three times as much effluent as its design capacity of 0.5 mgd, the facility must reevaluate its capacity and submit the updated plan to DEQ by the date specified in the submission schedule.

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) specified in 40 CFR 403.3(v). Therefore, DEQ does not require an authorized pretreatment program. The permittee must ensure that pollutants from nondomestic wastes discharged to its system do not negatively impact system operation or pass through the facility. The permittee must not authorize indirect discharges of pollutants that would inhibit, interfere, or otherwise be incompatible with operation of the wastewater treatment works, including interference with the use or disposal of municipal sludge.

5.3 Spill Control Plan

The permittee must develop or update and implement a plan for a Spill Control Plan due to the storage and usage of sodium hypochlorite at the facility's chlorination building.

6 Standard Conditions

Section 4 of the 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. 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, maintain, and implement procedures to ensure that the monitoring data submitted is accurate and explain data anomalies if they occur. 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 permittees 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 develop, maintain, 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 develop, 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 as required in the permit.
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 reporting.
4. Ensure that appropriate personnel understand, are appropriately trained on, and follow the Emergency Response Plan; and
5. Provide emergency facility operation.

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 City of Montpelier's city engineer conducted seepage testing of the facility's lagoons in 2009. Therefore, lagoon seepage testing requirements were included in the permit's special conditions and submission schedule.

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. Seepage testing must be repeated every 10 years or less after successfully completing a seepage test as specified in IDAPA 58.01.16.493.02.

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 Part 503 and the requirements of Idaho's Wastewater Rules (IDAPA 58.01.16.480 and 650). The Part 503 regulations are self-implementing, which means that 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 58.01.16.450 and 58.01.16.650). Operations of these sludge processing, storage, and disposal activities must comply with the facility's sludge management plan.

8 Permit Expiration or Modification

The permit will expire five years from 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 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

DEQ. 2006. *Bear River/Malad River Subbasin Assessment and Total Maximum Daily Load Plan for HUCs 16010102, 16010201, 16010202, 16010204.* Idaho Department of Environmental Quality. Pocatello Regional Office. March 2006.

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Appendix A. Facility Maps / Process Schematics

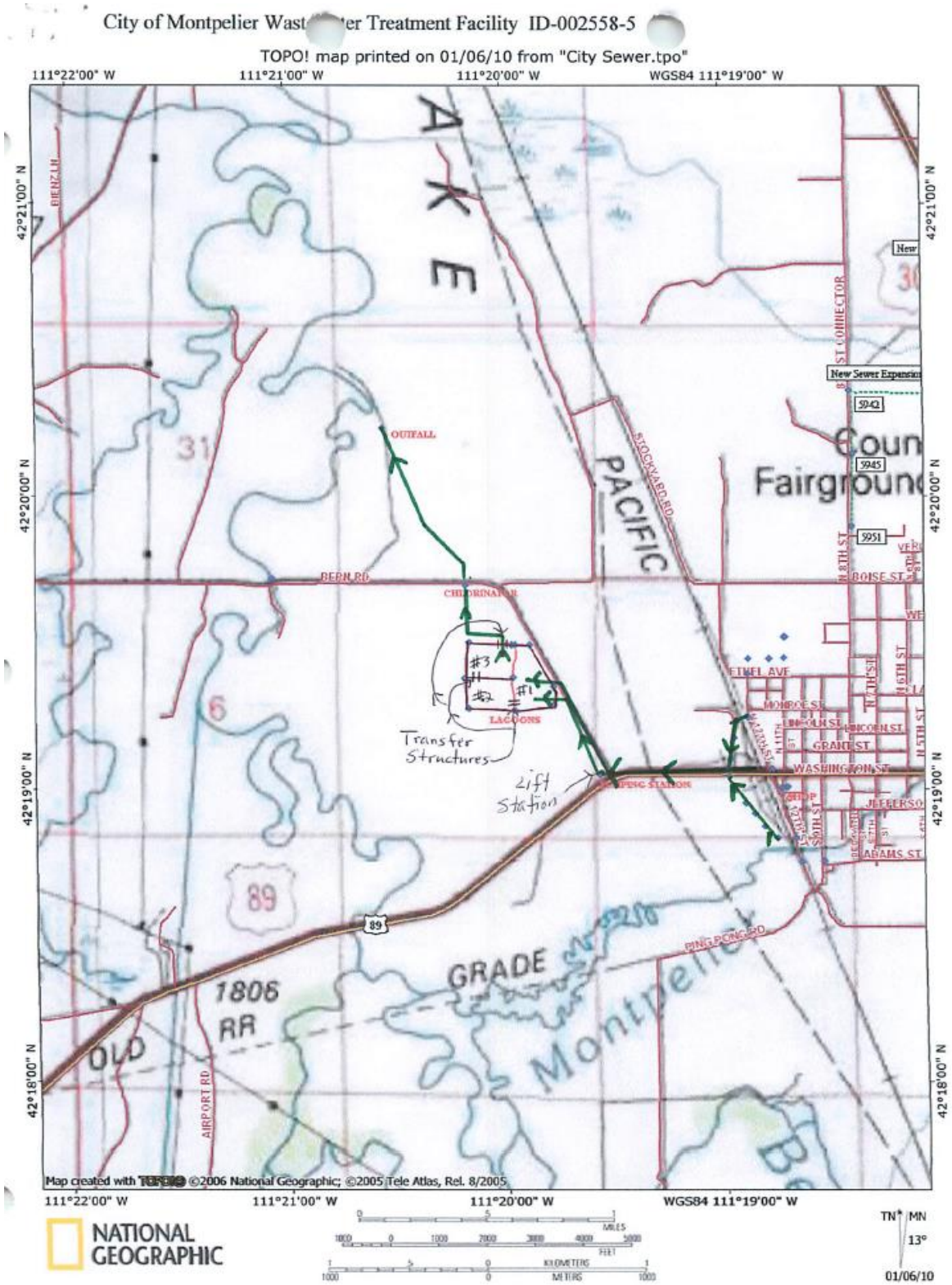

Figure 1. Topographic map of the Montpelier WWTF.

Appendix B. Technical Calculations

The results of the technical calculations are discussed above 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 federally promulgated secondary treatment effluent concentration and removal rate limits are listed below in Table 25. The effluent limits proposed in the permit for BOD_5 and TSS are technology-based, except for the average monthly mass limit for TSS, which is a seasonal WQBEL prescribed in the TMDL.

Table 25. Secondary treatment standards.

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

All other parameter limits for E. coli, pH, temperature, chlorine, ammonia, and phosphorus are based on WQBELs in order to ensure compliance with water quality standards. RPA was conducted for TRC and total ammonia, and reasonable potential to exceed water quality standards existed in October. No reasonable potential existed to prompt limit development in May. Equations used in this determination are given below.

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.

After characterizing the effluent and receiving water, DEQ compares the projected receiving water concentration after the effluent is discharged to the water quality criteria for the pollutant of concern. If the projected concentration exceeds the criterion, there is reasonable potential and an effluent limit is developed.

If DEQ chooses to authorize a mixing zone, the water quality criteria must still be met at the edge of the mixing zone. If after the analysis of the mixing zone, water quality criteria are not being met, the facility will receive an effluent limit that identifies both the size of the mixing zone and the final effluent limit.

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 2. 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 mixing zone	From mixing zone analysis
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 3. Dilution factor calculation.

The above equations for C_d are the forms of the mass balance equation that 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 4, 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 4. Coefficient of variation calculation.

$$C_e = MOEC\ x\ RPMF$$

Equation 5. Critical effluent concentration 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.

Example RPA Calculations with no RPTE

Ammonia - May

The calculations below are also shown in Table 26.

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

Equation 6. Downstream receiving water concentration

Where:

C_d = downstream receiving water concentration	= calculated
Q_e = critical effluent flow	= 0.77 cfs (0.5 mgd design flow)
$Q_{u\text{-}acute}$ = critical upstream flow (1Q10)	= 85.4 cfs
$Q_{u\text{-}chronic}$ = critical upstream flow (30Q5)	= 267 cfs
%MZ = percent of critical low flow	Acute: 11% Chronic: 13% (rounded up to nearest whole percent)
C_u = critical upstream concentration	= 112 µg/L
C_e = critical effluent pollutant concentration	= $MOEC \times RPMF$ = 25,391 µg/L
MOEC = maximum observed effluent concentration	= 5,290 µg/L
RPMF = reasonable potential multiplying factor	=4.8 (see Table 26)

$$C_{d-acute} = \frac{\left(25{,}391\ \frac{\mu g}{L} \times 0.77cfs\right) + \lfloor 112\mu g/L(85.4\ cfs \times 11\%)\rfloor}{0.77\ cfs + (85.4cfs \times 11\%)}$$

$$C_{d-acute} = \frac{(19{,}551) + \lfloor 1{,}052\rfloor}{10.16}$$

$$C_{d-acute} = 2{,}027$$

Acute WQS for ammonia is 2,139 µg/L. $C_{d\text{-}acute}$ < WQS therefore there is no reasonable potential to cause or contribute to water quality impairments.

$$C_{d-chronic} = \frac{\left(25{,}391\ \frac{\mu g}{L} \times 0.77cfs\right) + \lfloor 112\mu g/L(267\ cfs \times 13\%)\rfloor}{0.77\ cfs + (267cfs \times 13\%)}$$

$$C_{d-chronic} = \frac{(19{,}551) + \lfloor 3{,}887\rfloor}{35.48}$$

$$C_{d-chronic} = 660$$

Chronic WQS for ammonia is 690 µg/L. $C_{d\text{-}chronic}$ < WQS therefore there is no reasonable potential to cause or contribute to water quality impairments.

C. WQBEL Calculations

The following calculations demonstrate how the WQBELs in the permit were calculated. The permit includes WQBELs for ammonia, TSS, and TP. The following discussion presents the general equations used to calculate the WQBELs. The calculations for WQBELs are summarized in section 3.3.

Calculate the Wasteload Allocations (WLAs) and Long-Term Averages (LTAs)

The simple mass-balance equation used in Equation 2 solves for the critical effluent pollutant concentration (C_e), which is equivalent to the WLA (Equation 7). C_e must be calculated for both acute and chronic criteria. The downstream receiving water concentration, C_d, is replaced with the WQC, acute or chronic, for the pollutant under consideration.

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

Equation 7. 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 7

Idaho's water quality criteria for some metals are expressed as the dissolved fraction, but the rules regulating the IPDES program (IDAPA 58.01.25.303.03) 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 waste load allocation in total recoverable metal that will be protective of the dissolved criterion. This is accomplished by dividing the WLA expressed as dissolved by the criteria translator. 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.

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 8. Acute LTA for toxics.

Where:

LTA_a = Acute long-term average	Calculated value
WLA_a = Acute wasteload allocation	Calculated value. See Equation 7.
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 9. Chronic LTA average for toxics.

Where:

LTA_c = Chronic long-term average	Calculated value
WLA_c = Chronic wasteload allocation	Calculated value. See Equation 7.
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.
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 10. Maximum daily limit for toxics.

Where:

LTA_m = Minimum long-term average value	Lesser value calculated from Equation 8 and Equation 9
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 of base e
Z_{99} = z score of the 99th percentile of the normal distribution	2.326
CV = Coefficient of variation	Calculated using field data. If 10 or less, samples available use default value of 0.6.

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

Equation 11. Average monthly limit for toxics.

Where:

LTA_m = Minimum long-term average	Lesser value calculated from Equation 8 and Equation 9
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 4.

Example RPA Calculations with RPTE

Ammonia - October

The calculations below are also shown in Table 26.

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

Where:

C_d = downstream receiving water concentration	= calculated
Q_e = critical effluent flow	= 0.77 cfs (0.5 mgd design flow)
$Q_{u\text{-acute}}$ = critical upstream flow (1Q10)	= 34.5 cfs
$Q_{u\text{-chronic}}$ = critical upstream flow (30Q5)	= 74.3 cfs
%MZ = percent of critical low flow	Acute 18%, Chronic 25%
C_u = critical upstream concentration	= 83.5 µg/L
C_e = critical effluent pollutant concentration	= $MOEC \times RPMF$ = 29,278 µg/L
MOEC = maximum observed effluent concentration	= 5,200 µg/L
RPMF = reasonable potential multiplying factor	=5.6 (see Table 26)

$$C_{d-acute} = \frac{\left(29{,}278\frac{\mu g}{L} \times 0.77cfs\right) + \lfloor 83.5\mu g/L(34.5\ cfs \times 18\%)\rfloor}{0.77\ cfs + (34.5cfs \times 18\%)}$$

$$C_{d-acute} = \frac{(22{,}544) + \lfloor 518\rfloor}{7.0}$$

$$C_{d-acute} = 3{,}295$$

Acute WQS for ammonia is 3,371 µg/L. $C_{d\text{-}acute}$ < WQS therefore there is no reasonable potential to cause or contribute to water quality impairments.

$$C_{d-chronic} = \frac{\left(29{,}278\frac{\mu g}{L} \times 0.77cfs\right) + \lfloor 83.5\mu g/L(74.3cfs \times 25\%)\rfloor}{0.77\ cfs + (74.3cfs \times 25\%)}$$

$$C_{d-chronic} = \frac{(22{,}544) + \lfloor 1{,}551\rfloor}{19}$$

$$C_{d-chronic} = 1{,}268$$

Chronic WQS for ammonia is 1,030 µg/L. $C_{d\text{-}chronic}$ > WQS therefore there is reasonable potential to cause or contribute to water quality impairments.

In first step in calculating effluent limits, the wasteload allocation (WLA) of both acute and chronic are calculated.

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

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

$$WLA_{(a)} = \frac{3{,}371\ \mu g/L[0.77cfs + (34.5cfs \times 18\%)] - [83.5 \times (34.5cfs \times 18\%)]}{0.77cfs}$$

$$WLA_{(a)} = \frac{23{,}530 - [518]}{0.77}$$

$$WLA^{3}{}_{(a)} = 29{,}885\ \mu g/L$$

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

$$WLA_{(c)} = \frac{1{,}030\ \mu g/L[0.77cfs + (74.3cfs \times 25\%)] - [83.5 \times (74.3cfs \times 25\%)]}{0.77cfs}$$

$$WLA_{(c)} = \frac{19{,}952 - [1{,}551]}{0.77}$$

$$WLA^{4}{}_{(c)} = 23{,}862\ \mu g/L$$

A long term average (LTA) is calculated using the values in the step above.

$$LTA_a = WLA_a \times e^{(0.5\sigma^2 - z_{99}\sigma)}$$

Where:

LTA_a = Acute long-term average	Calculated value
WLA_a = Acute wasteload allocation	=29,885 ug/L
e = Base of natural log	Approximately 2.718
σ = Square root of σ^2	=0.962
$\sigma^2 = Ln(CV^2+1)$	=0.925
CV = Coefficient of variation	1.233 (n=13)
Z_{99} = z score of the 99th percentile of the normal distribution	2.326

$$LTA_a = 29{,}885\ \mu g/L \times 2.718^{(0.5*0.925 - 2.326*0.962)}$$

$$LTA_a = 5{,}046\ \mu g/L$$

[3] Does not exactly match Table 26 due to rounding.

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

Where:

LTA_c = Chronic long-term average	Calculated value
WLA_c = Chronic wasteload allocation	=23,862 ug/L
e = Base of natural log	Approximately 2.718
σ_n = Square root of σ_n^2	=0.222
σ_n^2 = Ln[(CV^2)/n + 1)]	=0.049
CV = Coefficient of variation	=1.233
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)	30

$$LTA_c = 23{,}862\ \mu\text{g/L} \times 2.718^{(0.5*0.049-2.326*0.222)}$$
$$LTA_c = 14{,}524\ \mu\text{g/L}$$

The acute long term average is more limiting and will be used for effluent limit calculations.

$$Maximum\ Daily\ Limit = LTA_m \times e^{(z_{99}\sigma - 0.5\sigma^2)}$$

Where:

LTA_m = Minimum long-term average value	=5,046 ug/L
σ = Square root of σ^2	=0.962
σ^2 = Ln(CV^2+1)	=0.925
Z_{99} = z score of the 99th percentile of the normal distribution	2.326

$$Maximum\ Daily\ Limit = 5{,}046\ \text{ug/L} \times e^{(2.326*0.962-0.5*0.925)}$$
$$Maximum\ Daily\ Limit = 29{,}765\ \mu\text{g/L}$$

Maximum Daily Limit = 30 mg/L × 0.5 mgd × 8.34 = 124 lb/day

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

Where:

LTA_m = Minimum long-term average	=5,046 ug/L
AML = Average monthly limit	Calculated value
e = Base of natural log	Approximately 2.718
σ_n = Square root of σ_n^2	=0.222
σ_n^2 = Ln[(CV^2)/n + 1]	=0.049
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	= 30

$$AML = 5{,}046\ \text{ug/L} \times e^{(1.645*0.222-0.5*0.049)}$$

$$AML = 7{,}097\ \text{ug/L}$$

Average Monthly Limit = 7.1 mg/L × 0.5 mgd × 8.34 = 30 lb/day

Table 26 details the RPA and WQBELs calculations for ammonia and chlorine.

[4] Does not exactly match Table 26 due to rounding.

Table 26. RPA and WQBELs Calculations.

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

Facility Name	City of Montpelier
Facility Flow (mgd)	0.5
Facility Flow (cfs)	0.8

Critical River Flows	(IDAPA 58.01.02 03. b)	Seasonal May Crit. Flows	Seasonal Oct Crit. Flows	units
Aquatic Life - Acute Criteria - Criterion Max. Concentration (CMC)	1Q10	85.4	34.5	cfs
Aquatic Life - Chronic Criteria - Criterion Continuous Concentration (CCC)	7Q10 or 4B3	107	36.4	cfs
Ammonia	30B3/30Q10 (seasonal)			cfs
Human Health - Non-Carcinogen	30Q5	267	74.3	cfs
Human Health - carcinogen	Harmonic Mean Flow			cfs

Receiving Water Data		Notes:	Seasonal	Seasonal	
Hardness, as mg/L $CaCO_3$	Hardness, as mg/L $CaCO_3$	5th percentile @ critical flows			min. hardness 25
Temperature, °C	Temperature, °C	90th - 95th percentile	21.6	21.48	
pH, S.U.	pH, S.U.	90th - 95th percentile	8.5	8.265	

Pollutants of Concern			AMMONIA, default: cold water, fish early life stages present		CHLORINE (Total Residual)	CHLORINE (Total Residual)
Effluent Data	Number of Samples in Data Set (n)		11	13	40	48
	Coefficient of Variation (CV) = Std. Dev./Mean (default CV = 0.6)		0.975	1.233	0.64	0.49
	Effluent Concentration, µg/L (Max. or 95th Percentile) - (C_e)		5,290	5,200	60	60
	Calculated 50th % Effluent Conc. (when n>10), Human Health Only					
Receiving Water Statistics	90th Percentile Conc., µg/L - (C_u)		112	83.5	0	0
	Geometric Mean, µg/L, Human Health Criteria Only					
Applicable Water Quality Criteria	Aquatic Life Criteria, µg/L	Acute	2,139	3,371	19.	19.
	Aquatic Life Criteria, µg/L	Chronic	690	1,030	11.	11.
	Human Health Water and Organism, µg/L		--	--	--	--
	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
Assign Percent Mixing	Use this row to set the mixing zone size instead of letting it auto-calculate					
Percent River Flow	Aquatic Life - Acute	1Q10	10.4%	17.7%	5%	9.0%
	Aquatic Life - Chronic	7Q10 or 4B3			7%	16.3%
		30B3 or 30Q10			--	--
	Human Health - Non-Carcinogen and Chronic Ammonia	30Q5	12.4%	25.0%	--	--
	Human Health - Carcinogen	Harmonic Mean			--	--
Calculated Dilution Factors (DF) (or enter Modeled DFs)	Aquatic Life - Acute	1Q10	12.5	8.9	6.52	5.01
	Aquatic Life - Chronic	7Q10 or 4B3			10.35	8.65
		30B3 or 30Q10			--	--
	Human Health - Non-Carcinogen and Chronic Ammonia	30Q5	44	25	--	--
	Human Health - Carcinogen	Harmonic Mean			--	--

Aquatic Life Reasonable Potential Analysis

σ	$\sigma^2=\ln(CV^2+1)$		0.817	0.961	0.586	0.464
P_n	=(1-confidence level)$^{1/n}$, where confidence level =	99%	0.658	0.702	0.891	0.909
Multiplier (TSD p. 57)	$=\exp(z\sigma-0.5\sigma^2)/\exp[\text{normsinv}(P_n)\sigma-0.5\sigma^2]$, where	99%	4.8	5.6	1.9	1.6
Statistically projected critical discharge concentration (C_e)			25402	29266	113.85	95.18
Predicted max. conc.(ug/L) at Edge-of-Mixing Zone		Acute	2139	3371	17.46	19
(note: for metals, concentration as dissolved using conversion factor as translator)		Chronic	690	1250	11	11
Reasonable Potential To Exceed (RPTE) Aquatic Life Criteria			**No**	**Yes**	**No**	**No**

Table 27. RPA and WQBELs Calculations (continued).

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

Facility Name	City of Montpelier
Facility Flow (mgd)	0.5
Facility Flow (cfs)	0.8

Critical River Flows	(IDAPA 58.01.02 03. b)	Seasonal May Crit. Flows	Seasonal Oct Crit. Flows	units
Aquatic Life - Acute Criteria - Criterion Max. Concentration (CMC)	1Q10	85.4	34.5	cfs
Aquatic Life - Chronic Criteria - Criterion Continuous Concentration (CCC)	7Q10 or 4B3	107	36.4	cfs
Ammonia	30B3/30Q10 (seasonal)			cfs
Human Health - Non-Carcinogen	30Q5	267	74.3	cfs
Human Health - carcinogen	Harmonic Mean Flow			cfs

Receiving Water Data		Notes:	Seasonal	Seasonal	
Hardness, as mg/L $CaCO_3$	Hardness, as mg/L $CaCO_3$	5th percentile @ critical flows			min. hardness
Temperature, °C	Temperature, °C	90th - 95th percentile	21.6	21.48	
pH, S.U.	pH, S.U.	90th - 95th percentile	8.5	8.265	

Pollutants of Concern			AMMONIA, default: cold water, fish early life stages present		CHLORINE (Total Residual)	CHLORINE (Total Residual)
Aquatic Life Reasonable Potential Analysis						
σ	$\sigma^2=\ln(CV^2+1)$		0.817	0.961	0.586	0.464
P_n	=(1-confidence level)$^{1/n}$, where confidence level =	99%	0.658	0.702	0.891	0.909
Multiplier (TSD p. 57)	$=\exp(z\sigma-0.5\sigma^2)/\exp[\text{normsinv}(P_n)\sigma-0.5\sigma^2]$, where	99%	4.8	5.6	1.9	1.6
Statistically projected critical discharge concentration (C_e)			25402	29266	113.85	95.18
Predicted max. conc.(ug/L) at Edge-of-Mixing Zone		Acute	2139	3371	17.46	19
(note: for metals, concentration as dissolved using conversion factor as translator)		Chronic	690	1250	11	11
Reasonable Potential To Exceed (RPTE) Aquatic Life Criteria			**No**	**Yes**	**No**	**No**
Aquatic Life Effluent Limit Calculations						
Number of Compliance Samples Expected per month (n)				30		
n used to calculate AML (if chronic is limiting then use min=4 or for ammonia min=30)			--	30	--	--
LTA Coeff. Var. (CV), decimal (Use CV of data set or default = 0.6)			--	1.233	--	--
Permit Limit Coeff. Var. (CV), decimal (Use CV from data set or default = 0.6)			--	1.233	--	--
Acute WLA, ug/L	$C_a = (\text{Acute Criteria} \times MZ_a) - C_u \times (MZ_a-1)$	Acute	--	29,266	--	--
Chronic WLA, ug/L	$C_c = (\text{Chronic Criteria} \times MZ_c) - C_u \times (MZ_c-1)$	Chronic	--	23,771	--	--
Long Term Ave (LTA), ug/L	WLAc x $\exp(0.5\sigma^2-z\sigma)$, Acute	99%	--	4,963	--	--
(99th % occurrence prob.)	WLAa x $\exp(0.5\sigma^2-z\sigma)$; ammonia n=30, Chronic	99%	--	14,526	--	--
Limiting LTA, ug/L	used as basis for limits calculation		--	4,963	--	--
Applicable Metals Criteria Translator (metals limits as total recoverable)					--	--
Average Monthly Limit (AML), ug/L , where % occurrence prob =		95%	--	**6979**	--	--
Maximum Daily Limit (MDL), ug/L , where % occurrence prob =		99%	--	**29266**	--	--
Average Monthly Limit (AML), mg/L			--	**7.0**	--	--
Maximum Daily Limit (MDL), mg/L			--	**29**	--	--
Average Monthly Limit (AML), lb/day			--	**29**	--	--
Maximum Daily Limit (MDL), lb/day			--	**122**	--	--

Table 28. TP TMDL WLA WQBEL Calculations.

Annual/Seasonal Limit Calculations where the TMDL WLA is Assumed the LTA

	TP			
ENTER TMDL WLA:	9.71	lb/day	602 lb/yr	<-TMDL WLA
Design Flow:	0.8		62 days of discharge /season	

Multiplier to Calculate Permit Limits from LTA

Reference: TSD Page 103

Number of Samples per Month (n)				2
Number of Samples per Week Set (n/4)				0.5
(i.e. 4 if sampling weekly for a month)				
Coefficient of Variation (CV) = Std. Dev./Mean				0.5
weekly σ	σ = std deviation			0.637
	$\sigma^2=\ln(CV^2/(n/4)+1)$			0.118
monthly σ	σ n= std deviation			0.343
	$\sigma n^2=\ln(CV^2/n+1)$			0.118
Average Monthly Limit (AML),	$\exp(z\sigma_n-0.5z\sigma_n^2)$; where % probability basis =	95%	Z= 1.64	1.66
Maximum Daily Limit (MDL),	$\exp(z\sigma-0.5z\sigma^2)$; where % probability basis=	99%	Z= 2.33	2.68
Average Weekly Limit (AWL),	$\exp(z\sigma_{n/4}-0.5z\sigma_{n/4}^2)$; where % probability basis =	99%	Z= 2.33	3.59
Ratio AWL/AML				2.17

Calculation:	LTA, Limiting	x	Multiplier	=	Limit		Concentration	
AML = LTA, limiting x Multiplier	9.71	x	1.66	=	16.1	lb/day	NA	mg/L
MDL = LTA, limiting x Multiplier	9.71	x	2.68	=	NA	lb/day	NA	mg/L
AWL = AML x Multiplier	16.1	x	2.17	=	NA	lb/day	NA	mg/L
AAL/AAS=					9.71	lb/day	NA	mg/L

Table 29. TSS TMDL WLA WQBEL Calculations.

Annual/Seasonal Limit Calculations where the TMDL WLA is Assumed the LTA																
	TSS			6790	kg/yr	<-TMDL WLA										
ENTER TMDL WLA:	**41**	lb/day		14969	lb/yr											
Design Flow:	**0.8**	cfs														
Multiplier to Calculate Permit Limits from LTA						Reference: TSD Page 103										
Number of Samples per Month (n)					**2**											
Number of Samples per Week Set (n/4)					**0.5**											
(i.e. 4 if sampling weekly for a month)																
Coefficient of Variation (CV) = Std. Dev./Mean					**0.997**											
weekly σ	σ = std deviation				1.046											
	$\sigma^2=\ln(CV^2(n/4)+1)$				0.403											
monthly σ	σ n= std deviation				0.635											
	$\sigma n^2=\ln(CV^2/n+1)$				0.403	**Calculation:**	**LTA, Limiting**		**x**	**Multiplier**	**=**	**Limit**		**Concentration**	
Average Monthly Limit (AML),	$\exp(z\sigma_n-0.5z\sigma_n^2)$; where % probability basis =	**95%**	Z=	1.64	2.32	AML = LTA, limiting x Multiplier	41		x	2.32	=	95	lb/day	NA	mg/L
Maximum Daily Limit (MDL),	$\exp(z\sigma-0.5z\sigma^2)$; where % probability basis=	**99%**	Z=	2.33	4.89	MDL = LTA, limiting x Multiplier	41		x	4.89	=	NA	lb/day	NA	mg/L
Average Weekly Limit (AWL),	$\exp(z\sigma_{n/4}-0.5z\sigma_{n/4}^2)$; where % probability basis =	**99%**	Z=	2.33	6.60	AWL = AML x Multiplier	95.26		x	2.84	=	270	lb/day	NA	mg/L
Ratio AWL/AML					2.84	AAL/AAS=						41	lb/day	NA	mg/L

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

Appendix D. Public Involvement Information

Public Involvement Information

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

DEQ will place a Public Notice of Draft on 11/06/2019 in News Examiner to inform the public and to invite comment on the draft IPDES 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.

DEQ SEEKS COMMENT ON DRAFT IDAHO POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT FOR THE CITY OF MONTPELIER WASTEWATER TREATMENT FACIITY

PROPOSED ACTION: The City of Shoshone applied to the Department of Environmental Quality (DEQ) for an Idaho Pollutant Discharge Elimination (IPDES) wastewater discharge permit for its municipal wastewater treatment facility located on 47 Bern Road in Montpelier, ID. The DEQ is seeking public comment on a draft IPDES permit, associated fact sheet, and application for the City of Montpelier Wastewater Treatment Facility. This proposed permit authorizes the discharge of treated municipal wastewater May and October to the Bear River for five years. The permit identifies the pollutants of concern and lists the required limits for each pollutant or parameter, monitoring requirements, and reporting requirements necessary to ensure compliance with the permit and protect human health and the environment.

PUBLIC COMMENT PERIOD: Notice is given that DEQ has scheduled a period to receive public comments. Written comments on the draft permit and fact sheet will be accepted through Friday, December 6th, 2019 at 5 p.m. MST. A public hearing may be held if requested in writing by Wednesday, November 20th, 2019. The draft permit and fact sheet are available for public review at DEQ's state office in Boise, Pocatello Regional Office, and on DEQ's website. *http://www.deq.idaho.gov/news-public-comments-events/*

SUBMISSION OF WRITTEN COMMENTS–ASSISTANCE ON TECHNICAL QUESTIONS: Anyone may submit written comment regarding the proposed permit. To be most effective, comments should address water quality considerations and include supporting materials where available. Comments, requests, and questions regarding the public comment process should be directed to Lori Flook, Department of Environmental Quality, 1410 N. Hilton, Boise, Idaho 83706-1255; lori.flook@deq.idaho.gov; or to the DEQ Web site at http://www.deq.idaho.gov. Please reference the city name and permit number when sending comments or questions. All information regarding this matter, including the issuance of the final permit, will be available on DEQ's Web site.
Submit requests for a public meeting or written comments on the draft permit and fact sheet electronically on DEQ's website, by mail, or email to:

Lori Flook
Idaho Department of Environmental Quality
Water Quality Division
1410 N. Hilton
Boise, ID 83706
Email: lori.flook@deq.idaho.gov

Appendix E. Public Comments and Response to Comments

Idaho Pollutant Discharge Elimination System Discharge Permit No. ID0025585

Response to Comments on Draft City of Montpelier IPDES Permit

December 20, 2019 comment deadline

City of Montpelier December 19, 2019 Letter

1. The Idaho Department of Environmental Quality (DEQ) is seeking public comment on a draft Idaho Pollutant Discharge Elimination System (IPDES) permit for the City of Montpelier Wastewater Treatment Facility (draft Permit). AIC and Sunrise Engineering have worked with the City of Montpelier to review and develop comments on the draft Permit.

   The City concurs with, and adopts, the comments submitted by the Association of Idaho Cities and Sunrise Engineering on the draft City of Montpelier IPDES Permit.

   The City appreciates the opportunity to submit the attached comments on the November 6, 2019 draft IPDES permit for the City of Montpelier, Idaho. AIC and Sunrise Engineering appreciate DEQ staff efforts and understands the advantages to Idaho cities for delegation of the Clean Water Act discharge permit program to Idaho including (1) access to regulators and technical compliance assistance, (2) increased competency of state regulators and technical compliance assistance, and (3) access to and improved coordination of state and federal financial and technical resources for facility planning and capital improvements.

Response 1. Thank you for your comment. See responses below to Association of Idaho Cities (AIC) comments.

Changes to draft permit: None.

Association of Idaho Cities, December 20, 2019 Letter

2. General Comments
   AIC and Sunrise Engineering have consulted with the City of Montpelier (City) and are submitting these with concurrence and support from the City. We appreciate the opportunity to comment on the proposed IPDES Permit (draft Permit) for the City of Montpelier and look forward to working with our State of Idaho partners in the development of final Permit conditions and Fact Sheet that conform with state and federal regulations, protects water quality in Idaho, and achieves a cost-effective use of local funding and resources to treat and constructively manage municipal sewage.

The protection of public health and safety is an important responsibility of Idaho communities. These stakeholders consistently seek to ensure compliance, and wish to preserve their ability to comply over the long term with Clean Water Act regulations. Both financial and technical resources are required by Idaho communities in order to ensure these investments are made in a manner that will ensure long-term compliance under the Clean Water Act. Idaho communities' investments must be informed through a well-supported IPDES permitting program that takes into account the need to sometimes apply integrative planning and management strategies over the long term.

The City of Montpelier Supports a Number of Proposed Permit Requirements

The City supports a number of proposed Permit requirements and wishes to draw attention to a few in particular:

- Providing a table that lists all of the important compliance deadlines in a clear, and easy to use format (See Submission Schedule, page 2).
- Addressing the City of Montpelier's need to comply with IDAPA 58.01.02.200 through a streamlined approach for Narrative Limits monitoring and compliance (See Section 1.2.2).
- Providing a regulatory mixing zone as permitted under the Idaho and federal rules and regulations (See Section 1.3 and Table 3).
- Clarifying that, with the regulatory mixing zone, a total residual chlorine limit is not required (See Section 1.2, Table 2 in the Permit and Section 4.2.1, Table 19 in the Fact Sheet).
- Clarifying that the required monitoring must be completed using sufficiently sensitive methods and conducted according to test procedures approved under 40 CFR 136, but that the Permittee may request different MLs in writing, subject to DEQ approval (i.e., "If the permittee is unable to attain the required ML in its effluent due to matrix effects, the permittee must submit a matrix- specific detection limit and a ML to DEQ with appropriate laboratory documentation." See Section 2.1.6).

Response 2: Thank you for the comment. Please note, the only ML listed in the City of Montpelier permit is for total residual chlorine (TRC). TRC is toxic to aquatic life at very low levels (0.019 mg/L acutely toxic and 0.011 mg/L chronically toxic). Levels of TRC that low are not quantifiable using EPA approved analytical methods (40 CFR 136). EPA approved methods can measure an ML of 0.050 mg/L for TRC. Monitoring down to that ML will ensure aquatic life is protected, and is consistent with IPDES/NPDES permitting.

Changes to draft permit: None.

3. Submission Schedule Issue #1
   Issue #1: The Submission Date for the Spring Discharge Monitoring Report and the Inclusion of a Submission Date for the Fall DSM
   Request:
   The City requests that the final Permit be revised to show the initial submittal date for the DMR for the May monitoring period to mid- to late-June, following the May discharge period. Similarly, the City requests that the initial submittal date for the fall DMR

deadline first be listed on the Submission Schedule, and reflect a mid- to late-November submittal, following the October discharge period (See Section 1.2.1).
Explanation:
The City believes that the compliance activities and dates that set forth in the draft Permit's Submission Schedule on page 2 and associated initial and annual submittal dates for the October discharge periods are in error in that they do not provide adequate time for laboratory analysis following the data collection.

Response 3: All DMR data must be submitted no later than the 20th of the month following monitoring. For example, all monitoring data sampled in May must be reported by June 20th. DMR data must include all effluent, influent, and receiving water monitoring data as specified in the permit. The October DMR was not included in the submission schedule table, because only the "Initial Submittal Dates" are listed for required submissions.

Changes to draft permit: The initial DMR due for this permittee is June 20th, 2020. This change has been made to the draft permit.

4. Quality Assurance Plans Ensure Accurate Data Submittals Issue #2
   Issue #2: The Initiation of DMR Submittals Create Unnecessary Regulatory Risks for the City
   Request:
   To ensure the City's effluent monitoring and sampling data are correct and reflect actual facility operations, the City requests that effluent monitoring QAPP submittal(s) occur prior to data collection and initial NetDMR submittal deadlines. The City requests that the QAPP submittal deadlines remain the same, but that the initiation of the NetDMR data submittals be established to follow the August 28, 2020 QAPP submittal date.
   Explanation:
   As stated in Section 2.1.6.1, "The permittee must develop and implement a QAPP that conforms to the quality assurance and quality control requirements of 40 CFR 136.7. The requirements for a QAPP are in section 4.1.1 of this permit." This Section goes on to state additional requirements that support the collection and reporting of accurate effluent monitoring results. The City understands the importance of ensuring monitoring data are correct and the very important role QAPPs play. Therefore, we feel it is critically important for the QAPP to be developed and submitted prior to the initial monitoring data submittals via the NetDMR.

Response 4: The submittal item due August 28, 2020 is a "Quality Assurance Project Plan (QAPP) Notification." This notification is a statement verifying all QAPP elements have been updated, as necessary[5] — DEQ does not approve QAPPs. The facility currently has a QAPP, which may need an update to reflect the reissued permit. Additionally, NetDMR submittals cannot be postponed; compliance monitoring must take place whenever a permittee is discharging, regardless of the status of a QAPP or other supporting documentation.

[5] Permittees must prepare a QAPP consistent with the EPA-approved quality assurance/quality control (QA/QC) and chain-of-custody (COC) procedures described in *EPA Requirements for Quality Assurance Project Plans* (EPA 2001) and *Guidance for Quality Assurance Project Plans* (EPA 2002).

Changes to draft permit: None

5. Effluent Limits – Total Phosphorus Issue #3

Issue #3: Seasonal Total Phosphorus Effluent Limitations Provided by the 2013 Bear River TMDL Addendum Reflect Cumulative Nutrient Impacts

Request:
The City respectfully requests that the TP effluent limits be set as an Average Seasonal Limit (i.e., presented in a new column) in order for Table 2 to be consistent with the language in Section 1.2.1; and that the seasonal TP effluent limit be set at 9.7 lb/day in order for the effluent limits to reflect the revised waste load allocations presented in the 2013 Bear River TMDL Addendum[1]and 5-Year Bear River TMDL Review Completed in 2017.[2]

[1] Suggested text: The seasonal average limit and related requirements for total phosphorus at Outfall 001 is as follows:

- The season is limited to May and October.
- The permittee must monitor effluent total phosphorus with grab samples twice per month at Outfall 001.
- The seasonal average total phosphorus load must not exceed ***9.7 lb/day***.
- The seasonal average total phosphorus load must be calculated as the sum of all daily loads measured for total phosphorus during a discharge season, divided by the number of measurements for total phosphorus during that period.
- The seasonal average total phosphorus load must be reported annually on the ***November*** DMR.

[2] "TP load reductions were required for each of these WWTPs as part of the original 2006 TMDL. However, the 2013 addendum reviewed these waste loads relative to extensive monitoring data collected on the mainstem Bear River (2006–2009). ***As phosphorus targets were met in the river (except excess TP associated with sediment during high flows), waste load allocations were revised to dischargers' (Montpelier, Soda Springs, and Grace) current loads***." See pg. 12, Bear River Basin TMDL Five-Year Review Hydrologic Unit Codes 16010102, 16010201, 16010202, and 16010204 (emphasis added); http://www.deq.idaho.gov/media/60179558/bear-river-basin-tmdl-five-year-review-0117.pdf

Explanation:
The water quality-based effluent limits for TP in Table 2 is inconsistent with Section 1.2.1, in that the effluent limits are seasonal in nature, not monthly. Further, the seasonal limits presented in Section 1.2.1, Table 2, and the Fact Sheet do not reflect the finding in the 2013 Bear River TMDL Addendum that the City of Montpelier has achieved the limits established in the approved 2006 TMDL and thus now must meet "current loads"[3] for TP.

The City reminds IDEQ that the City only discharges for a total of 62 days per year, 31 days during the months of May and October respectively. Further, the City's population served (i.e., roughly 2,600) has remained essentially unchanged since 2010, and that nearly 25% of the City's population is classified as having an income that is under the national poverty threshold.

Even with these financial burdens, however, please understand that the City strongly supports the protection of the beneficial uses, including strategies that are effective in limiting the growth of nuisance algae in the Bear River. Tourism, hunting, fishing, and swimming are fundamental Montpelier community values and priorities.

Montpelier's municipal leaders and technical staff appreciate the varied requirements and policies used to develop Idaho's TMDLs, and understand that one of the key requirements is that the TMDL is to set forth a maximum daily load, in addition to other maximum load thresholds that apply to longer load durations (i.e., seasonal) when these are found to impact the beneficial uses. Today's comments are not questioning how maximum daily loads have been established by the 2013 Bear River TMDL Addendum, or their use in the mathematical calculations for the seasonal limits established by the IDEQ.
What is being questioned, and rejected by the City, is how the draft Permit fails to address the following facts: (1) a nutrient such as TP is not a toxic pollutant but instead may impact surface water bodies during the growing season, where the ***cumulative seasonal loads*** to the water body pose potential impacts to beneficial uses (i.e., as represented by a daily load in the calculations, where the total seasonal load is the driving limitation); (2) that the City's facility ***operations*** (i.e., only discharging for total of 62 days per year) are applied in order to successfully comply with the City's Bear River TMDL TP waste load allocations; (3) how the findings of the 2013 Bear River TMDL Addendum ***revise the City's waste load allocations*** to the "current loads;"[4] and, (4) that instream physical conditions such as clarity and velocity are frequently the primary factors leading to nuisance algae growth (i.e., apparent beneficial use impairments, when no dissolved oxygen sags are detected), even when extremely low nutrient concentrations exist.[5]

[3]"Based on Bear and Cub River data, these water bodies are generally meeting TMDL total phosphorus targets. Wastewater treatment plant (WWTP) discharges to these waterbodies are ***not presently impacting water quality to an extent that reductions will be required***. Present wasteloads from ***Montpelier***, Georgetown, Soda Springs, Grace, and Franklin are recommended as target wasteload allocations." See pg. xxiv, Executive Summary, *Bear River Basin Addendum to the Bear River/Malad Subbasin Assessment and Total Maximum Daily Load Plan for HUCs 16010102, 16010201, 16010202, 16010204* (emphasis added); http://www.deq.idaho.gov/media/449998-bear_river_basin_tmdl_addendum_revision.pdf
[4] The City's "revised TP WLA (lb/day)" as presented in Table 13, column 8, of the 2013 Bear River TMDL Addendum represents these "current loads" and is 1.65 lb/day, or 602 lb/year. See http://www.deq.idaho.gov/media/449998-bear_river_basin_tmdl_addendum_revision.pdf, pg. 30.
[5]Drawing upon a case study from the Red River Basin, and also being looked into by Idaho USGS researchers for the Mid Snake River, Idaho appears to need "… a more holistic approach to eutrophication management that includes more sophisticated regime-based nutrient criteria and considers other nutrient and pollutant controls and river restoration (e.g., physical habitat and functional food web interactions) to promote more resilient water quality and ecosystem functioning…" See https://cdn.ymaws.com/idahocities.org/resource/resmgr/water/2019/why_tp_tmdl_fails_2018.pdf.

Response 5: DEQ agrees the WLA given in the 2013 Bear River TMDL Addendum is 1.65 lb/day or 602 lb/year. DEQ reviewed the calculations made to develop the TP WLA and has updated the TP section 3.3.3.5 in the fact sheet. The rationale for the change in limit is copied here.

The Bear River is impaired for TP, and the Bear River TMDL (DEQ 2006) and Bear River TMDL addendum (DEQ 2011, revised 2013) prescribes an annual WLA of 602 lb/year and 1.65 lb/day for the City of Montpelier.

The TMDL annual load published in the 2011 was developed using data collected between 2006 and 2009. The annual load was developed using a mean value for effluent TP (1.24 mg/L) and an averaged flow value (1.995 cfs/1.29 MGD).

The TMDL took into consideration the discharge season. Usually the season is two months, but during TMDL development the permittee only discharged 30 days during 2008 and 2009. The mean discharge period at the time of TMDL development was 45 days[6]*.*

$$\frac{1.24\ mg}{1\ L} \times \frac{1.29\ mil\ gal}{1\ day} \times \frac{8.34\ lb}{gallon} = 13.36 \frac{lb}{day}$$

$$\frac{13.36\ lb}{1\ day} \times \frac{45\ days}{1\ year} = 601.2 \frac{lb}{year}$$

The 2011 TMDL addendum takes into account that the discharge is not year-round; nevertheless it divided the annual load by 365 days in the event that the permittee could someday expand their discharge season. This calculation derives the 1.65 lb/day seen in the 2011 TMDL addendum (602 lb/year ÷365 days = 1.65 lb/day). This permit does not expand the discharge season, thus the daily loads are calculated to be as follows:

$$\frac{602\ lb}{1\ year} \times \frac{1\ year}{62\ days\ of\ discharge} = 9.71 \frac{lb}{day}$$

*The daily load of 9.7 lb/day was used to calculate an average monthly concentration limit for the nutrient (see Table 28*Table 28 *in the fact sheet). This limit ensures that the annual loading of TP will not exceed the annual load of 602 lb/year.*

DEQ also agrees that nutrients are not toxic pollutants, and thus the averaging periods for limits are longer. This has been taken into account in limit development as per ELDG Section 3.7.1.6.1:

> *"If the discharger has a nutrient WLA from a TMDL, DEQ will set the WQBELs equal to the WLAs (NACWA 2014). The TSD's focus on toxics and human health and aquatic life impacts strongly discourages this practice because it is perceived as insufficiently conservative. This assumption is appropriate when addressing pollutants that exhibit acute and chronic toxic affects; nutrients do not impact aquatic life and human health in this manner. EPA is appropriately concerned with toxics because of the disparity between the criterion averaging period (4 days for chronic toxins) and the limit averaging period (30 days). The disparity between the averaging periods allows exceedances of the chronic (4-day) criterion and still yield compliance with the monthly average (30-day) limit. This situation is not typical when addressing nutrients. It is more probable that the nutrient criteria and WLA have averaging periods of the same duration as the limits. For WLAs with longer averaging periods (seasonal or annual), the*

[6] (60 days + 60 days + 30 days + 30 days)/4 years = 45 days/year

> *WLA's use as a WQBEL is as conservative, if not more conservative, than the TSD approach, as stated in a review of EPA methods (NACWA 2014):*
>
> > *...limits for any averaging period can be higher or lower than the WLA, depending on the CV, sampling frequency, and probability bases. As the averaging period of the WLA increases to 30-days and longer, the AML will usually be higher than the WLA. Hence, setting monthly, seasonal, or annual WQBELs to the WLA tends to be a conservative approach. In addition, as the averaging period of the WLA and sample number increase, the LTA becomes closer to the WLA, such that there is little difference between the TSD approach and simply setting the WQBEL to the WLA.*
>
> *Other factors that support the using WLAs as WQBELs are based on the conservative nature of WLA models, conservative nature of water quality criteria, and requirement for a margin of safety in TMDLs. Steady-state WLA models assume that the receiving water body's low-flow conditions are synchronized with the maximum discharge flow and loads. These assumptions yield WLAs that are sufficiently conservative to be used as WQBELs for nutrients that do not exhibit neither acute nor chronic toxic effects on aquatic life or human health." (emphasis added).*

Instead of setting the TMDL WLA of 9.71 lb/day to a maximum daily limit, DEQ used TSD calculations to compute a statistically equivalent average monthly limit (see Table 28 of the updated fact sheet for calculation). As the reference above states, averaging period duration and number of samples drive limit values, thus the monthly limit of 16.1 lb/day is larger than the 9.71 lb/day WLA, but is still protective of water quality. Simultaneously, the City of Montpelier is required to meet narrative criteria in IDAPA 58.01.02.200.

Please note that five-year reviews are not EPA-approved documents and cannot be used to derive permit limits.

Changes to draft permit: The seasonal load limit has been updated to 9.71 lb/day and the monthly limit has been updated to 16.1 lb/day.

6. Dissolved Oxygen Monitoring for Permit Renewal Application Issue #4

   Issue #4: The Draft Permit Erroneously Requires a 24-Hour Composite Sample for Dissolved Oxygen, a Non-Conservative Element

   Request:
   The City requests Table 9 be revised to require a grab sample for the dissolved oxygen permit renewal application, or simply removed.

   Explanation:
   The language at 40 CFR 122.21 for POTWs states that the samples for pollutants are to be analyzed "in accordance with analytical methods approved under 40 CFR Part 136 unless an alternative is specified in the existing NPDES permit." We have found the requirement to collect a 24-hour dissolved oxygen composite sample in the City's existing permit.
   The 1999 Form-2A instructions provide for a grab sample from holding ponds or other impoundments that have a retention period greater than 24 hours. Dissolved oxygen is not explicitly identified, but this exemption was applied to this very same dissolved oxygen

permit renewal application monitoring requirement in the recent draft City of Cascade IPDES Permit.[6]

EPA Headquarters, when asked about this issue, points towards the Enforcement Guidance and appears to understand that the correct laboratory method for dissolved oxygen is a grab sample, base on Page 101 of the NPDES Compliance Inspection Manual Chapter 5 – Sampling.[7]

Personal communication from EPA Region 10 staff, Susan Poulsom, indicates that Region 10 does not have guidance that requires composite sampling for dissolved oxygen, and agrees that dissolved oxygen grab samples are appropriate. IDEQ staff's response indicated that the IDEQ will re-evaluate their interpretation regarding the requirement to collect 24-hour composite dissolved oxygen samples.[8] If the IDEQ believes that they are constrained by the CFR language, it appears one of the few ways this issue can be addressed is to apply the provision in the first paragraph of 40 CFR 122.21(j):
"...The Director may waive any requirement of this paragraph if he or she has access to substantially identical information. The Director may also waive any requirement of this paragraph that is not of material concern for a specific permit, if approved by the Regional Administrator..."

[6]See the September 5, 2019 Draft IPDES POTW Permit No. ID0023167 - City of Cascade, Table 10, footnote a.
[7]"The collection of a grab sample is appropriate when a sample is needed to:

- Represent an effluent that does not discharge on a continuous basis.
- Provide information about instantaneous concentrations of pollutants at a specific time.
- Allow collection of a variable sample volume.
- Corroborate composite samples.
- Monitor parameters not amenable to compositing (e.g., pH, temperature, ***dissolved oxygen***, chlorine, purgeable organics, oil and grease, coliform bacteria, and others specified by the NPDES permit, which may include phenols, sulfites, and hexavalent chromium). (emphasis added) See https://www.epa.gov/sites/production/files/2017-03/documents/npdesinspect-chapter-05.pdf

[8] https://cdn.ymaws.com/idahocities.org/resource/resmgr/water/2019/2019_december_email_from_mar.pdf

Response 6: According to IDAPA 58.01.25.105.11.g.ii.(1), the only parameters to be sampled via grab sample for POTW permit renewal applications are pH, temperature, cyanide, total phenols, residual chlorine, oil and grease, fecal coliform, and volatile organics. All other permit renewal parameters must be collected with a 24-hour composite sample. DEQ has the discretion to waive a permit renewal requirement if DEQ has access to substantially identical information (IDAPA 58.01.25.105.11.b). Effluent samples from a pond with greater than 24-hour holding time is substantially identical to a 24-hour composite from the same pond. The sampling method waiver is now applied to City of Montpelier permit renewal sampling.

Changes to draft permit: All permit renewal monitoring parameters collection methods have been changed to grab samples, consistent with 40 CFR 136.

Idaho Conservation League, December 17, 2019 Letter

7. Incorrect application of antidegradation policy
   In revising this permit, DEQ has made the determination that the relevant section of the Bear River is impaired for primary contact recreation and therefore is only afforded Tier I rather than Tier II protection. We believe that this determination is incorrect based on how the available water quality data was used to justify that decision.

   As noted by the Fact Sheet on page 27, the current 2016 Integrated report lists the primary contact recreation use as being "fully supporting" for this section of the Bear River. In summer 2018, DEQ collected an additional series of five samples in order to calculate a geometric mean for E. coli. Notably, the dataset included four samples between 108 and 124 organisms per 100 mL and a single sample of 1046.2 per 100 mL – a clear outlier. With this exceedingly high sample included, the geometric mean is 178.4, which led to DEQ's assumption that the waterbody is impaired for primary contact recreation because it exceeded the geometric mean criterion in IDAPA 58.01.02.251.01.a. However, with that outlier sample excluded, the geometric mean drops down to 114.7, which would confirm that the primary contact recreation use is indeed supported and would warrant the waterbody receiving Tier II protection in this IPDES permit.

   This discussion is relevant because DEQ did not appear to follow a subsequent rule in this section of the water quality standards, namely 58.01.02.251.01.c ("Additional Sampling"). This rule reads as follows:

   > *When a single sample maximum, as set forth in Subsections 251.01.b.i., 251.01.b.ii., and 251.01.b.iii., is exceeded, additional samples should be taken to assess compliance with the geometric mean E. coli criteria in Subsection 251.01.a. Sufficient additional samples should be taken by the Department to calculate a geometric mean in accordance with Subsection 251.01.a. This provision does not require additional ambient monitoring responsibilities for dischargers.*

   The purpose of that rule is clearly to avoid a situation such as this where a single outlier sample that far exceeds the single sample maximum unambiguously skews the geometric mean. We obtained DEQ's 2018 Bear River E. coli Study – the cited source for the E. coli data referenced in the Fact Sheet – via public records request. Nowhere in this study nor in the relevant section of the Fact Sheet is it mentioned that "sufficient additional samples" were taken to calculate a proper geomean for E. coli that is not substantially skewed by what appears to be an outlier in the current dataset. This leads us to logically conclude that those additional samples were never taken, resulting in an inappropriate geometric mean for E. coli that in turn led to an improper antidegradation determination in the draft IPDES permit for the City of Montpelier.

   Additionally, the E. coli samples collected in the 2018 study were taken *downstream* of the discharging facility at the Pescadero Road Bridge near the USGS gauge at that site.

Given that DEQ is using the results of those samples to presume that this section of the Bear River is impaired for primary contact recreation, the fact that the samples were taken downstream of the facility is problematic (even though the original intent of the sampling was different). Antidegradation determinations and Tier II protections must be based on the receiving water (i.e., just upstream of the discharge point) so as to not bias the results with the possible effects of discharge from the facility itself. Pursuant to IDAPA 58.01.02.052.06.b, receiving water quality must be measured "immediately above the discharge for flowing waters."

Based on the totality of the information available to us, we assert that DEQ cannot presume that this section of the Bear River is impaired for primary contact recreation. Pursuant to IDAPA 58.01.02.052.05.a ("Identification of Tier II Waters"), this waterbody must instead be provided Tier II protection because it is identified in the current 2016 Integrated report as fully supporting primary contact recreation use. The 2018 data and associated geometric mean that DEQ references in the Fact Sheet cannot be used to determine impairment because the full stipulations of Section 251 of the Idaho WQS have not been met. Furthermore, DEQ's draft implementation guidance in Section 2.3 (Assigning Tier II Protection) states that "DEQ may also consider how well the available data represent that water."

<u>We expect DEQ to correct the implementation of the antidegradation policy for primary contact recreation in the permit and then re-solicit it for public comment with a Tier II analysis included.</u>

This permit highlights a potentially broader issue with DEQ's implementation of their antidegradation policy. Essentially, this situation shows that DEQ can make antidegradation decisions on the basis of a very small sample size. As it stands right now, the difference between Tier I and Tier II protection for primary contact recreation on this waterbody is a single E. coli sample that far exceeded the standard deviation of the entire dataset and by any statistical means would be considered an outlier. Basing antidegradation protections on such minimal and unrepresentative data is dubious at best and negligent at worst – not to mention inconsistent with the overall intent of the antidegradation policy.

Response 7: Upon closer examination, the E. coli geomean data collected in 2018 at the Pescadero Bridge (adjacent to the USGS gaging station), is in Assessment Unit (AU) ID16010201BR002_06. The permittee discharges to the upstream AU ID16010201BR002_05, and the geomean will not be used for antidegradation analysis purposes.

Please note that DEQ submitted the permit for public comment for 30 days (IDAPA 58.01.109.c) and changes to the permit are logical outgrowths of comments received. Accordingly, DEQ will not seek public comment a second time.

Changes to draft permit: Because the 2016 IR identifies ID16010201BR002_05 as fully supporting for primary contact recreation, a Tier II analysis for primary contact recreation has been included in section 3.5.2 of the fact sheet. The change in tier has resulted in the removal of the E. coli instantaneous limit (see section 3.5.2.3 and 3.6.4 of the fact sheet for antidegradation

and antibacksliding analysis of E. coli). Upstream receiving water monitoring for E. coli has been added to verify the receiving water still supports the primary contact recreation beneficial use.

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8. EPA staff had similar concerns as ICL regarding the antidegradation evaluation.

Response 8: See response 7.

Changes to draft permit: See response 7.

Other changes

Permit template text changes to improve clarity of the permit include:

9. The term and definition of scan has been removed. Text refers to permit renewal "samples" instead of "scans."
10. A footnote referring to *E. coli* effluent samples has been changed to:
    Idaho's water quality standards for primary contact recreation include a single sample value of 406 #/100 ml. Exceedance of this value indicates likely exceedance of the 126 #/100 ml average monthly effluent limit. If this value is exceeded at any point within the month, the facility should consider collecting more than the 5 samples per month required in this permit to determine compliance with the monthly geometric mean ~~begin monitoring~~ according to IDAPA 58.01.02.251.01.a. ~~to determine compliance with the monthly geomean.~~