Fact Sheet for IPDES Permit No. ID0021806

07/31/2020

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 Cambridge POTW
195 East Central Avenue
Cambridge, ID 83610

Public Comment Start Date:	04/29/2020
Public Comment Expiration Date:	05/29/2020
Technical Contact:	Michael Snider, (208) 373-0176 michael.snider@deq.idaho.gov

Purpose of this Fact Sheet

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

This fact sheet complies with IDAPA 58.01.25.108.02, which requires DEQ to prepare a draft 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
1B3	Biologically-based and indicates an allowable exceedance of once every 3 years.
4B3	Biologically-based and indicates an allowable exceedance for 4 consecutive days once every 3 years.
7Q10	7-day, 10 year low flow
30B3	Biologically-based design flow intended to ensure an excursion frequency of less than once every three years, for a 30-day average flow.
30Q5	30-day, 5 year low flow
30Q10	30-day, 10 year low flow
AML	Average Monthly Limit
BOD_5	Biochemical Oxygen Demand, five-day
BMP	Best Management Practices
°C	Degrees Celsius
$CBOD_5$	Carbonaceous Biochemical Oxygen Demand, five-day
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
CV	Coefficient of Variation
CWA	Clean Water Act
DEQ	Idaho Department of Environmental Quality
DMR	Discharge Monitoring Report
EPA	U.S. Environmental Protection Agency
IDAPA	Refers to citations of Idaho administrative rules
IDWR	Idaho Department of Water Resources
I/I	Inflow and Infiltration
IPDES	Idaho Pollutant Discharge Elimination System
lb/day	Pounds per day
LD_{50}	Dose at which 50% of test organisms die in a specified time period
LTA	Long Term Average
MDL	Maximum Daily Limit or Method Detection Limit
mgd	Million gallons per day
mg/L	Milligrams per liter
mL	Milliliters

O&M	Operations and maintenance
POC	Pollutant(s) of Concern
POTW	Publicly Owned Treatment Works
QAPP	Quality Assurance Project Plan
RPA	Reasonable Potential Analysis
RPMF	Reasonable Potential Multiplication Factor
RPTE	Reasonable Potential To Exceed
SIU	Significant Industrial User
s.u.	Standard Units
TBEL	Technology Based Effluent Limits
TMDL	Total Maximum Daily Load
TRC	Total Residual Chlorine
TRE	Toxicity Reduction Evaluation
TSD	Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001)
TSS	Total suspended solids
TU_c	Toxic Units, Chronic
WET	Whole Effluent Toxicity
USGS	United States Geological Survey
WLA	Wasteload allocation
WQBEL	Water quality-based effluent limit
WQC	Water Quality Criteria
WQS	Water Quality Standards

1 Introduction

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

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

This fact sheet includes:

- A map and description of the discharge location;
- A listing of 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, draft permit, and fact sheet describing the terms and conditions applicable to the permit are available for public review and comment during a public comment period. The public is provided at least 30 days to provide comments to DEQ. Persons wishing to request a public meeting for this facility's draft permit must do so in writing within 14 calendar days of public notice being published that a draft permit has been prepared; requests for public meetings must be submitted to DEQ by 05/13/2020. 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, 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, contact the permit writer.

After the close of the public comment period, DEQ considers information provided by the public, prepares a document summarizing the public comments received, and may make changes to the draft permit in response to the public comments. DEQ will include the summary and responses to comments in Appendix D of the final fact sheet. 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 comment 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 draft permit to develop and document specific grounds for objections to a proposed permit. If EPA objects to a proposed permit DEQ must satisfactorily address the objections within the time period specified in the memorandum of agreement between EPA and DEQ (40 CFR123.44). Otherwise, EPA may issue a permit in accordance with 40 CFR 121, 122, 124. If EPA issues the permit, any state, interstate agency, or interested person may request EPA hold a public hearing regarding the objection.

Permit Issuance

Following the public comment periods on a draft permit and after receipt of any comments on the proposed permit from EPA, DEQ will issue a final permit decision, the final permit, and the fact sheet. 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 draft 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, and fact sheet can also be found by visiting the DEQ website at "*http://www.deq.idaho.gov/news-public-comments-events/*."

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

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

Boise Regional Office
1445 North Orchard St.
Boise, ID 83706

Disability Reasonable Accommodation Notice

For technical questions regarding the permit or fact sheet, contact the permit writer at the phone number or e-mail address at the beginning of this fact sheet. Those with impaired hearing or speech may contact a TDD operator at 1-800-833-6384 (ask to be connected to the permit writer at the above phone number). Additional services can be made available to a person with disabilities by contacting the permit writer.

2 Background Information

2.1 Facility Description

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

Table 1. Facility information.

Permittee	City of Cambridge POTW
Facility Physical Address	195 East Central Boulevard Cambridge, ID 83610
Facility Mailing Address	P.O. Box 220 Cambridge, ID 83610
Facility Contact	Corey Morgan Public Works Supervisor (208) 257-3318
Responsible Official	Mayor Jack Toothman
Facility Location	Latitude: 44.56807° Longitude: -116.674220°
Receiving Water Name	Weiser River
Outfall Location	Latitude: 44.56797° Longitude: -116.67307°
Permit Status	
Application Submittal Date	October 7, 2009
Date Application Deemed Complete	January 8, 2010

The City owns and operates the POTW located in Cambridge, Idaho. The collection system has no combined sewers. The facility serves a resident population of 345 based on their permit application. There are no major or minor industries discharging to the facility.

2.1.1 Facility Information

The design flow of the facility is 0.25 mgd. The treatment process consists of three lagoons in sequence, followed by chlorine disinfection and dechlorination. Details about the wastewater treatment process are provided in Section 2.1.2, and a map showing the location of the treatment facility and discharge are included in Appendix A. Because the design flow is less than 1 mgd, and there are no major or minor industrial dischargers, the facility is considered a minor facility. From 2015 to 2016, the facility completed upgrades to repair the collection system to reduce Inflow and Infiltration (I/I), to remove sludge accumulation, to reline all ponds, raise dyke surfaces, install aerator anchors and mooring cable retrieval systems, install aerators in Lagoon 1, replenish the banks with clay-shale mix, install a new backup generator and install an awning over the final effluent weir.

2.1.2 Treatment Process

Wastewater enters the facility and flows through a bar basket before entering the influent flow meter. From there wastewater enters the western lagoon 1. Lagoon 1 is aerated with three aerators. After lagoon 1, wastewater flows through lagoons 2 and 3 before entering the chlorine

contact chamber along the north edge of the facility. From the contact chamber effluent is dechlorinated with sodium thiosulfate then discharged in the east edge of the site into Rush Creek approximately 300 feet above the confluence with the Weiser River.

2.1.3 Permit History

The facility was built in 1968. The existing permit was issued April 1, 2005, and expired March 31, 2010. The City submitted an application to EPA on October 7, 2009. Further materials associated with the application were submitted on December 7, 2009 and January 6, 2010. EPA determined that the application was timely and complete on January 8, 2010. The 2005 permit was administratively continued.

2.1.4 Compliance History

Since the 2005 permit became effective in April 2005, there have been 98 effluent limit violations. There have been 23 effluent limit violations after the completion of facility upgrades in December 2016 through May 2019, described below. The POTW has had fewer effluent violations each year since the completion of facility upgrades; 14 in 2017, 7 in 2018, and 2 in 2019.

Table 2. Effluent limit violations from December 2016 through May 2019.

Parameter Exceeding Permit Limits	Limit	Units	Number of Instances
BOD_5	Monthly Average	mg/L	5
BOD_5	Weekly Average	mg/L	3
BOD_5	Monthly Average	lb/day	4
BOD_5	Percent Removal	%	5
TSS	Monthly Average	mg/L	1
TSS	Monthly Average	lb/day	2
pH	Maximum	s.u.	2
E. coli	Monthly Average	cfu/100 ml	1

DEQ conducted an inspection of the facility in April 2018. The inspection encompassed the wastewater treatment process, records review, operation and maintenance, and the collection system. The April 2018 inspection found that there had been 20 effluent limit exceedances since the December 2014 inspection, that there had been 29 DMR non-receipts since the December 2014 inspection, and that in March 2018 the holding times for *E. coli* were exceeded.

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.

Sludge was removed from the ponds during the facility upgrades in 2015 and 2016. The permittee is required to prepare and submit a sludge depth report through the IPDES E-Permitting System for DEQ review as required in section 2.1.3 of the permit. The report must include sewage sludge monitoring for accumulation in the lagoons.

2.1.6 Outfall Description

The outfall is a 2-foot diameter pipe that discharges to Rush Creek on the east edge of the facility approximately near the confluence with the Weiser River. Due to the proximity to the Weiser River, the previous permit using the Weiser River as the receiving water, and the lack of information on the flow in Rush Creek, flow data from the Weiser River was used to develop this permit.

2.1.7 Wastewater Influent Characterization

The City reported the concentration of influent pollutants in Discharge Monitoring Reports (DMRs) and results are characterized in Table 3. The City completed a project to repair the collection system in 2016. The tabulated data represents the quality of the influent wastewater received from January 2017 through May 2019, after the completion of the maintenance project.

Table 3. Wastewater influent characterization from January 2017 through May 2019.

Parameter	Units	# of Samples	Average Value	Maximum Value	Data Source
BOD_5	mg/L	9	155	297	DMRs
TSS	mg/L	9	212	334	DMRs

2.1.8 Wastewater Effluent Characterization

The City reported the effluent pollutant concentrations in DMRs and results are characterized in Table 4. The City completed a project to reduce I/I in 2016. The tabulated data represents the quality of the effluent discharged from January 2017 through May 2019, after the completion of facility upgrades.

Table 4. Wastewater effluent characterization from January 2017 through May 2019.

Parameter	Units	# of Samples	Average Values	Maximum Values	Data Source
BOD_5	mg/L	11	29.1	55	DMRs
BOD_5 % Removal	%	11	84	96	DMRs
TSS	mg/L	10	29.3	64	DMRs
TSS % Removal	%	9	85	97	DMRs
Total Residual Chlorine	mg/L	10	0.05	0.08	DMRs
Ammonia, Total as N	mg/L	7	2.2	7.6	DMRs
Parameter	**Units**	**# of Samples**	**Average Geometric Mean**	**Maximum Reported Geometric Mean**	**Data Source**
E. Coli	#/100 mL	9	1.4	4	DMRs
Parameter	**Units**	**# of Samples**	**Minimum Value**	**Maximum Value**	**Data Source**
pH	s.u.	9	6.54	9.53	DMRs

2.2 Description of Receiving Water

The POTW discharges to the Weiser River in the Weiser Subbasin (HUC 17050124) Water Body Unit ID 17050124SW007_05. At the point of discharge, the Weiser River is protected for the following designated uses (IDAPA 58.01.02.140.18): Cold Water Aquatic Life, Primary Contact Recreation, and Drinking Water Supply.

According to DEQ's 2016 Integrated Report, this AU is not fully supporting one of its assessed uses. The aquatic life use is not fully supported. The cause of impairment is temperature. The contact recreation beneficial use is fully supported. As such, DEQ will provide Tier I protection (IDAPA 58.01.02.051.01) for the cold water aquatic life use and Tier II protection (IDAPA 58.01.02.051.02) in addition to Tier I for the primary contact recreation use (IDAPA 58.01.02.052.05.c). There is insufficient data to determine whether there is a healthy, balanced biological community in the reach that the City of Cambridge discharges to.

The outfall is located near the confluence of Rush Creek and the Weiser River. For more information on the outfall see 2.1.6 Outfall Description. The other nearby point source is the City of Council, approximately 30 miles upstream along the Weiser River. There are no nearby drinking water intakes. Potential non-point sources that are present in the watershed are agriculture, forestry, and natural and urban storm water. 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 nearby USGS stream gage #13258500 on the Weiser River.

Table 5. Ambient background data.

Parameter	Units	Percentile	Value
Temperature	°C	95th	17.3
pH	Standard units	5th – 95th	6.77 – 8.734
Ammonia	mg/L	90th	0.04
Total Phosphorus	mg/L	maximum	0.08

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 Weiser River Subbasin Temperature Total Maximum Daily Loads: Addendum to the Weiser River Subbasin Assessment and TMDL (June 2006) establishes WLAs for temperature. 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 temperature addendum provided an equation on page 39 which is the waste load allocation. The equation is included in the permit as the limit. The effluent limits and associated requirements contained in the permit are set at levels that are consistent with the TMDL.

2.2.2 Critical Conditions

The low flow conditions of a water body are used to determine water quality-based effluent limits (WQBELs). In general, Idaho's water quality standards (WQS) require criteria be evaluated at the following low flow design conditions (See IDAPA 58.01.02.210.03) as defined in Table 6. The 1Q10 represents the lowest one day flow with a recurrence frequency of once in 10 years. The 7Q10 represents lowest average seven consecutive day flow with a recurrence frequency of once in 10 years. The 30Q5 represents the lowest average 30 consecutive day flow with a recurrence frequency of once in five years.

Sources for data that DEQ examines are the United States Geological Survey (USGS), Idaho Department of Water Resources (IDWR) and other available data for the receiving water. For this permit, DEQ determined critical low flows upstream of the discharge from the USGS Station 13258500. The estimated low flows are presented in Table 6.

Table 6. Estimated low flows for the Weiser River near Cambridge.

Criteria	Flow Condition	Critical Flow (cfs)
Acute aquatic life	1Q10	24.2
Chronic aquatic life	7Q10	27.9
Ammonia	30Q5	44.8

2.3 Pollutants of Concern

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

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

To determine POCs for further analysis, DEQ evaluated all pertinent and available information such as the permit application, previous DMRs, raw discharge data provided by the facility, TMDLs and the facility's industrial user surveys. The wastewater treatment process for this facility includes three lagoons in sequence, followed by chlorine disinfection and dechlorination prior to discharge. Pollutants expected in the discharge from a facility with this type of treatment:

- TSS
- BOD_5
- *E. coli* bacteria
- Total Residual Chlorine
- pH
- Temperature
- Total Ammonia
- Total Phosphorus

3 Effluent Limits and Monitoring

Table 7 presents the effluent limits and monitoring requirements in the 2005 Permit. Table 8 presents the effluent limits and monitoring requirements in the 2020 permit.

Table 7. 2005 Permit - Effluent Limits and Monitoring Requirements.

Parameter	Effluent Limits				Monitoring Requirements		
	Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit	Instantaneous Maximum Limit	Sample Location	Sample Frequency	Sample Type
Flow	---	---	---	---	Effluent	5/week	Measure
BOD_5	30 mg/L	45 mg/L	---	---	Influent and Effluent	1/month	Grab
	63 lbs/day	94 lbs/day	---	---			
BOD_5 % Removal	85 %	---	---	---	Effluent		
TSS	45 mg/L	65 mg/L	---	---	Influent and Effluent	1/month	Grab
	94 lbs/day	136 lbs/day	---	---			
TSS % Removal	65%	---	---	---	Effluent		
E. coli[1,2]	126/100 ml	---	---	406/100 ml	Effluent	5/month	Grab
Total Residual Chlorine[2,3]	0.1 mg/L	---	0.3 mg/L	---	Effluent	1/week	Grab
	0.3 lbs/day	---	0.7 lbs/day	---			
Total Phosphorus[4]	---	---	---	---	Effluent	1/month	Grab
Total Ammonia[4]	---	---	---	---	Effluent	1/month	Grab

1) The average monthly *E. coli* count must not exceed a geometric mean of 126/100 ml based on a minimum of 5 samples taken every 3-5 days within a calendar month.
2) Reporting is required within 24 hours of a maximum daily limit or instantaneous maximum limit violation.
3) Chlorine effluent limits shall become effective January 1, 2008, in accordance with the conditions of the compliance schedule in Part 1.b., below.
4) Monitoring shall be conducted once per month starting in January 2006 and lasting for one year.

The pH range shall be 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.

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.

85% Removal Requirement for BOD_5: For each month, the monthly average effluent concentration shall not exceed 15 percent of the monthly average influent concentration.

65% Removal Requirement for TSS: For each month, the monthly average effluent concentration shall not exceed 35 percent of the monthly average influent concentration.

Percent removal of BOD5 and TSS shall be reported on the Discharge Monitoring Reports (DMRs). The monthly average percent removal shall be calculated from the arithmetic mean of the influent value and the arithmetic mean of the effluent value for that month. Influent and effluent samples shall be taken over approximately the same time period.

Table 8. 2020 Permit - Effluent Limits and Monitoring Requirements.

Parameter	Discharge Period	Units	Effluent Limits						Monitoring Requirements		Reporting Period (DMR Months)
			Monthly Average	Weekly Average	Monthly Geometric Mean	Instan-taneous Minimum	Instan-taneous Maximum	Daily Maximum	Sample Type	Sample Frequency	
Biochemical Oxygen Demand (BOD_5)	01/01 – 12/31	mg/L	45	65	—	—	—	—	8-hour composite	2/month	Monthly (All Months)[g]
		lb/day	94	136	—	—	—	—	Calculation[a]		
BOD_5 Percent Removal	01/01 – 12/31	%	68 (minimum)	—	—	—	—	—	Calculation[b]	1/month	
Total Suspended Solids (TSS)	01/01 – 12/31	mg/L	45	65	—	—	—	—	8-hour composite	2/month	Monthly (All Months)[g]
		lb/day	94	136	—	—	—	—	Calculation[a]		
TSS Percent Removal	01/01 – 12/31	%	71 (minimum)	—	—	—	—	—	Calculation[b]	1/month	
E. coli[c]	01/01 – 12/31	#/100 ml	—	—	126[d]	—	—	—	Grab[e,f]	5/month	Monthly (All Months)[g]
pH[c]	01/01 – 12/31	standard units (s.u.)	—	—	—	6.5	9.0	—	Grab[f]	2/week	Monthly (All Months)[g]
Ammonia, Total as N[c]	01/01 – 12/31	mg/L	8.6	—	—	—	—	22.4	8-hour composite	1/week	Monthly (All Months)[g]
		lb/day	17.9	—	—	—	—	46.8	Calculation[a]	1/month	
Total Residual Chlorine[c]	01/01 – 12/31	mg/L	0.1	—	—	—	—	0.3	Grab[f]	1/week	Monthly (All Months)[g]
		lb/day	0.3	—	—	—	—	0.7	Calculation[a]	1/month	
Temperatur e	01/01 – 12/31	°C	See Table 9						Recorded	Continuous	Monthly (All Months)[g]

a. Calculation - 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
b. % Removal= ([Influent](mg/L)-[Effluent](mg/L))/([Influent](mg/L))×100%
Braces “[ ]” indicate concentration of the attribute contained inside

c. 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 of the draft permit. For *E. coli*, the maximum daily threshold that triggers 24-hour reporting is 406 organisms/100 ml.
d. 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.
e. The average monthly *E. coli* bacteria counts must not exceed a geometric mean of 126/100 ml based on a minimum of 5 samples taken every 3 – 7 days within a calendar month.
f. A grab sample is an individual sample collected over a 15-minute period or less.
g. When the facility does not discharge during a month, it may report the appropriate No Data Indicator (NODI) code "C" on the monthly DMR.

Flow-dependent effluent limits and monitoring requirements for temperature at Outfall 001 are expressed in the equation below:

$$Effluent\ temperature\ (°C) = \frac{\left[\left(Effluent\ Flow + (0.25\ \times river\ flow)\right) \times (19°C + 0.3°C)\right] - \left[(0.25\ \times River\ Flow) \times 19°C\right]}{Effluent\ Flow}$$

Final temperature limits as displayed on the monthly DMR are shown in Table 9. The limits are in effect year round. Samples must be collected at Outfall 001 as a continuous recording and the daily average of the calendar month reported in an excel spreadsheet and uploaded to the IPDES E-Permitting system monthly. The temperature spreadsheet will be due contemporaneously with the monthly DMR submittals. Report the maximum daily average temperature calculated for each effluent flow and receiving water flow combination on the monthly DMR. If more than one daily average temperature exceeds the limit for the effluent flow and receiving water flow combination, a note must be included on the DMR.

Table 9. Temperature effluent limits[a,b] based upon discharge and Weiser River flow rates for Outfall 001.

Effluent Flow (MGD)	Effluent Limit Type	Units	Weiser River Flow (cfs)		
			≤15	>15 ≤ 30	>30
≤0.125	Maximum Daily Average [c,d,e]	°C	19.3	28.3	37.3
>0.125≤ 0.25		°C	19.3	23.8	28.3
>0.25		°C	19.3	21.6	23.8

a. TMDL temperature effluent limit equation: $Effluent\ temperature\ (°C)$=[($Average\ Daily\ Effluent\ Flow$+(0.25 ×$Average\ Daily\ River\ Flow$))×(19°$C$+0.3°$C$)]−[(0.25 ×$Average\ Daily\ River\ Flow$)×19°$C$]/ $Average\ Daily\ Effluent\ Flow$. Each cell is calculated using the upper limit of the effluent range, and the lower limit of the receiving water range. Effluent temperature limits calculated by the equation will always take precedent over table values for compliance purposes.
b. This effluent limit is subject to a compliance schedule as described in Permit Section 3.1.
c. Maximum of the daily averages for the reporting period (calendar month).
d. Temperature data must be recorded using DEQ-approved temperature monitoring devices set to record at 60-minute 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 maximum weekly average.

e. When the facility does not discharge during a month, it may report the appropriate No Data Indicator (NODI) code “C” on the monthly DMR.

3.1 Basis for Effluent Limits

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

TBELs are set according to the level of treatment that is achievable using available technology. 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 58.01.02) or the National Toxics Rule (40 CFR 131.36) applicable to the receiving water.

DEQ must apply the most stringent of the TBEL and WQBEL 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: 5-day biochemical oxygen demand (BOD_5), total suspended solids (TSS), and pH. These effluent limits are given in 40 CFR 133 and are outlined in Table 10.

Table 10. 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.	

The facility meets the three requirements for equivalent to secondary treatment listed under 40 CFR 133.101(g). 40 CFR 133.101(g) states:

"Facilities eligible for treatment equivalent to secondary treatment. Treatment works shall be eligible for consideration for effluent limitations described for treatment equivalent to secondary treatment (§ 133.105), if:

(1) The BOD_5 and SS effluent concentrations consistently achievable through proper operation and maintenance (§ 133.101(f)) of the treatment works exceed the minimum level of the effluent quality set forth in § 133.102(a) and 133.102(b),

(2) A trickling filter or waste stabilization pond is used as the principal process, and

(3) The treatment works provide significant biological treatment of municipal wastewater."

Significant biological treatment (§133.101(k)) is defined as "[t]*he use of an aerobic or anaerobic biological treatment process in a treatment works to consistently achieve a 30-day average of a least 65 percent removal of BOD_5*."

The minimum effluent limits for equivalent to secondary treatment from 40 CFR 133.105(a) and 40 CFR 133.105(b) are listed in Table 11.

Table 11. Equivalent to secondary treatment effluent limits (40 CFR 133.105).

Parameter	30-day average	7-day average
BOD_5	45 mg/L	65 mg/L
TSS	45 mg/L	65 mg/L
Removal for BOD_5 and TSS (concentration)	65% (minimum)	—
pH	within the limits of 6.0 - 9.0 s.u.	

The rationale for how the POTW meets the three conditions are explained below:

Rationale for meeting condition (1) from 40 CFR 133.101(g) above:

Using DMR data from May 2017 through May 2019, after the completion of facility upgrades, the facility has consistently failed to achieve the secondary treatment concentration requirements (Table 10) for BOD_5 and TSS. The facility does satisfy condition (1).

Rationale for meeting condition (2) from 40 CFR 133.101(g) above:

Three waste stabilization ponds are used as the principle treatment process at the POTW. The facility does satisfy condition (2).

Rationale for meeting condition (3) from 40 CFR 133.101(g) above:

The 5^{th} percentile of treatment for BOD_5 is 68.1%, which is greater than the 65% required treatment. Since the facility provides greater than 65% removal of BOD_5 at least 95% of the time, it provides significant biological treatment of the municipal wastewater. The facility does satisfy condition (3).

40 CFR 133.105 allows for "permit adjustments" that allow the permit writer to set more stringent limits than the minimum for equivalent to secondary. 40 CFR 133.105(f) states:

> *"(f) Permit adjustments. Any permit adjustment made pursuant to this part may not be any less stringent than the limitations required pursuant to §133.105(a)-(e). Furthermore, permitting authorities shall require more stringent limitations when adjusting permits if:*
>
> *(1) For existing facilities the permitting authority determines that the 30-day average and 7-day average BOD_5 and SS effluent values that could be achievable through proper operation and maintenance of the treatment works, based on an analysis of the past performance of the treatment works, would enable the treatment works to achieve more stringent limitations, or*

(2) For new facilities, the permitting authority determines that the 30-day average and 7-day average BOD_5 and SS effluent values that could be achievable through proper operation and maintenance of the treatment works, considering the design capability of the treatment process and geographical and climatic conditions, would enable the treatment works to achieve more stringent limitations."

Based on the above regulations and taking into account the DMR data from the last permit cycle after the completion of facility optimization and facility upgrades in 2016, the technology based effluent limits are as follows:

For BOD_5:

The POTW does meet the requirements for equivalent to secondary, so the BOD_5 AML is 45 mg/L, and the AWL is 65 mg/L. The 5^{th} percentile of BOD_5 percent removal was 68.1% after the facility upgrades were completed, which is higher than the minimum of 65% removal. Therefore the required percent removal of 68% is applied.

For TSS:

The POTW does meet the requirements for equivalent to secondary, so the TSS AML is 45 mg/L, and the AWL is 65 mg/L. The 5^{th} percentile of BOD_5 percent removal was 71% after the facility upgrades were completed, which is higher than the minimum of 65% removal. Therefore the required percent removal of 71% is applied.

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 and are calculated as follows:

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

Since the design flow for this facility is 0.25 mgd, the technology-based mass limits for:

BOD_5

Average Monthly Limit = 45 mg/l × 0.25 mgd × 8.34 = 94 lb/day

Average Weekly Limit = 65 mg/l × 0.25 mgd × 8.34 = 136 lb/day

TSS

Average Monthly Limit = 45 mg/l × 0.25 mgd × 8.34 = 94 lb/day

Average Weekly Limit = 65 mg/l × 0.25 mgd × 8.34 = 136 lb/day

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

3.3 Water Quality-Based Effluent Limits

3.3.1 Statutory and Regulatory Basis

Section 301(b)(1)(C) of the Clean Water Act (CWA) requires the development of limits in permits necessary to meet WQS. The IPDES regulation IDAPA 58.01.25.302.06 implementing Section 301(b)(1)(C) of the CWA requires that permits include limits for all pollutants or parameters that are or may be discharged at a level that will cause, have the reasonable potential to cause, or contribute to an excursion above any WQS including narrative criteria for water quality. Effluent limits must also meet the applicable water quality requirements of affected States other than the State in which the discharge originates, which may include downstream States (IDAPA 58.01.25.103.03, IDAPA 58.01.25.302.06, see also CWA Section 401(a)(2)).

The regulations require the permitting authority to make this evaluation using procedures that account for existing controls on point and non-point sources of pollution, the variability of the pollutant in the effluent, species sensitivity (for toxicity), and where appropriate, dilution in the receiving water. The limits must be stringent enough to ensure that WQS are met and must be consistent with any available TMDL WLA for the discharge. If there are no approved TMDLs that specify WLAs for this discharge, all of the WQBELs are calculated directly from the applicable WQS.

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

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

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

The mixing zones for the POTW's pollutants are summarized in Table 12. The calculated limits based on the size of the mixing zones do not impede receiving water beneficial uses. At the mixing zone percentages below and the corresponding limits, there is reasonable potential to cause or contribute to an exceedance of WQS for ammonia but there is no reasonable potential to cause or contribute to an exceedance of WQS for Total Residual Chlorine.

Table 12. Authorized mixing zones for the POTW.

Pollutant	Discharge Period	Authorized Mixing Zone (% of Critical Low Flow)			
		Aquatic Life		Human Health	
		Acute (1Q10)	Chronic (7Q10 or 30Q5)	Water and Fish	Fish Only
Total Residual Chlorine	01/01 – 12/31	5% of 24.2 cfs	8% of 27.9cfs	---	---
Ammonia, Total as N	01/01 – 12/31	25% of 24.2 cfs	25% of 44.8 cfs	---	---

The RPA and WQBEL calculations were based on mixing zones shown in Table 12. The equations used to conduct the RPA and calculate the WQBELs are provided in Appendix B. If DEQ revises the allowable mixing zone before final issuance of the permit, the RPA and WQBEL calculations will be revised accordingly.

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 Total Ammonia (as N)

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 13. Ammonia criteria.

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

INPUT	
1. Receiving Water Temperature (deg C):	17.3
2. Receiving Water pH:	8.73
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)	**1.39**
Chronic Criterion (CCC)	**0.62**

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

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

When granted a mixing zone of 25% of the chronic low flow, ammonia still has the reasonable potential to exceed water quality standards, therefore a limit for ammonia is included in the permit.

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. The Weiser River is impaired for temperature, so DEQ determined that the 95th percentile temperature and pH were appropriate for the ammonia calculation.

3.3.3.2 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 5 samples taken every 3 to 7 days over a 30-day period. A mixing zone is not appropriate for bacteria for waters designated for contact recreation. Therefore, the permit contains a monthly geometric mean effluent limit for *E. coli* of 126 organisms per 100 ml (IDAPA 58.01.02.251.01.a.).

The Idaho WQS also state that a water sample that exceeds certain "single sample maximum" values indicates a likely exceedance of the geometric mean criterion, although it is not, in and of itself, a violation of WQS. For waters designated for primary contact recreation, the "single sample maximum" value is 406 organisms per 100 mL (IDAPA 58.01.02.251.01.b.ii.). For waters designated only for secondary contact recreation the "single sample maximum" value is 576 organisms per 100 mL (IDAPA 58.01.02.251.01.b.i.). When a single sample maximum, is exceeded, additional samples should be taken to assess compliance with the geometric mean criterion.

Monitoring of the effluent five times per month will ensure compliance with the criterion can be assessed. If the single sample maximum is exceeded, the permittee may choose to monitor more frequently than the permit requires, ensuring adequate disinfection and compliance with permit effluent limits exists.

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.

3.3.3.3 Chlorine, Total Residual

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. A RPA showed that the discharge from the facility would not have the reasonable potential to cause or contribute to an exceedance of water quality standards when the facility is granted a mixing zone. See Appendix B for the reasonable potential and effluent limit calculations for chlorine.

3.3.3.4 pH

The Idaho WQS at IDAPA 58.01.02.250.01.a require pH values of the receiving water to be within the range of 6.5 to 9.0. Mixing zones are generally not granted for pH; therefore the most stringent WQC must be met before the effluent is discharged to the receiving water.

3.3.3.5 Temperature

The Weiser River Subbasin Temperature Total Maximum Daily Loads: Addendum to the Weiser River Subbasin Assessment and TMDL (2006) contained the following equation to calculate temperature limits for the effluent discharge for the City of Cambridge.

Effluent temperature (°C) = (((effluent flow + (0.25 x river flow)) x (19 + 0.3)) – ((0.25 x river flow) x 19)) / effluent flow

The equation has been included in the permit as the limit. To determine compliance with the limit, the city is required to monitor effluent flow, effluent temperature, and receiving water flow.

3.3.3.6 Phosphorus, Total as P

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

3.4 Narrative Criteria

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

3.5 Antidegradation

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

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

protect existing uses fully and must assure that there will be achieved the highest statutory and regulatory requirements for all new and existing point sources (IDAPA 58.01.02.051.02; 58.01.02.052.08).

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

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

According to the 2016 Integrated Report, the Weiser River aquatic life use is not fully supported. The cause of impairment is temperature. There is insufficient data to determine whether a healthy, balanced biological community exists in this reach, so it is not considered high quality for aquatic life. The Weiser River is considered high quality for primary contact recreation.

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 uses and the level of water quality necessary to protect existing uses shall be maintained and protected. In order to protect and maintain existing and designated beneficial uses, a permitted discharge must comply with narrative and numeric criteria of the Idaho WQS, as well as other provisions of the WQS.

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 Weiser River Subbasin Temperature Total Maximum Daily Loads: Addendum to the Weiser River Subbasin Assessment and TMDL (June 2006) establishes WLAs for temperature.

The effluent limits and associated requirements contained in the 2020 permit are set at levels that ensure compliance with the narrative and numeric criteria in the WQS and the WLAs established in the TMDL. Therefore, DEQ has determined the permit will protect and maintain existing and designated beneficial uses in the Weiser 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 Weiser River is considered high quality for primary contact recreation. As such, the water quality relevant to primary contact recreation of the Weiser 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 Weiser River (IDAPA 58.01.02.052.06); these include temperature, *E. coli*, phosphorus, total as P and ammonia, total as N**.** The flow based temperature limit in the permit is based on the wasteload allocation in the TMDL. Ammonia, Total as N received a new limit in the 2020 permit that will ensure compliance with water quality standards at the edge of the mixing zone. Effluent limits for *E. coli* are set in the 2020 and 2005 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 2020 permit, this means determining the permit's effect on water quality based upon the limits for pollutants with limits in both the 2005 permit and the 2020 permit. Table 14 provides a summary of the 2005 permit limits and the 2020 permit limits.

The *E. coli* maximum daily limit of 406/100 mL in the 2005 permit has been removed from the 2020 permit. The maximum daily limit was included in the previous permit by EPA as an incorrect interpretation of the Idaho Water Quality Standards. The WQS recommend that additional sampling be conducted if a daily *E. coli* sample is collected that exceeds 406/100 mL, but it is not intended to be a limit. The 406/100 mL has been included in the permit as a recommendation for additional sampling. Since the design flow of the facility has also remained the same, no degradation of water quality is expected based on the *E. coli* limits.

BOD_5 limits are changing from 30 mg/L and 45 mg/L in the 2005 permit, to 45 mg/L and 65 mg/L in the 2020 permit. The city did not qualify for equivalent to secondary standards for BOD_5 in the 2005 permit because of excessive I/I. The facility completed upgrades to their collection system in 2016. The load associated with the previous permit was higher due to the higher discharge flow from the I/I. Since the collection system upgrades, the volume regularly discharged has decreased back under the facility's design flow. The total load of BOD_5 being discharged to the Weiser River is expected to be comparable to the previously permitted load, therefore no degradation in water quality is expected.

3.5.2.2 Pollutants with new Limits in the 2020 Permit

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 includes new limits for ammonia, total as N and temperature. The temperature limit is based on the equation in the TMDL. The temperature limits in the permit reflect a maintenance or improvement in water quality from current conditions, and are consistent with the TMDL WLA. Therefore no adverse change in water quality and no degradation from this discharge are expected to occur with respect to temperature.

The ammonia, total as N limit is based on the reasonable potential calculations in Appendix B. The existing discharge was determined to cause reasonable potential to exceed water quality criteria. The ammonia, total as N limit in the 2020 permit reduces the discharge of ammonia to the Weiser River, so it is expected to result in an improvement in water quality from current conditions. Therefore no adverse change in water quality and no degradation from this discharge is expected to occur with respect to ammonia.

3.5.2.3 Pollutants with no Limits

For pollutants that do not have limits in either the existing permit and which will not be limited in the new permit, a change in water quality is determined by reviewing whether changes in production, treatment, or operation will likely increase the discharge of those pollutants. Phosphorus, Total as P doesn't have limits in either the 2005 permit or the 2020 permit. The new treatment plant should treat phosphorus better than the old lagoon system did. The design flow of the facility is the same, so there should be no change or a reduction in phosphorus discharge.

Table 14. Antidegradation comparison for protection of the primary contact recreation beneficial use.

Pollutant	Units	2005 Permit			2020 Permit			Degradation[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								
E. coli	no./100 mL	126	---	406	126	---	---	No
Pollutants with new limits in the 2020 permit								
Temperature	°C	---	---	---	See Table 9			No
Ammonia, Total as N	mg/L	---	---	---	8.6	---	22.4	No
	lb/day	---	---	---	17.9	---	46.8	No
Pollutants with no limits in both the 2005 and 2020 permit								
Phosphorus, Total as P	mg/L	---	---	---	---	---	---	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

3.6 Antibacksliding

Sections 303(d)(4) and 402(o) of the CWA and regulations at IDAPA 58.01.25.200 generally prohibit the renewal, reissuance, or modification of an existing IPDES permit that contains effluent limits, permit conditions, or standards that are less stringent than those established in the existing permit (i.e., antibacksliding) but provides limited exceptions. For explanation of the antibacksliding exceptions refer to section 4.1 of the Effluent Limit Development Guidance (DEQ 2017).

DEQ compared the effluent limits in the 2005 permit with the 2020 permit in Table 15.

Table 15. 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 20209 permit								
BOD_5	mg/L	30	45	—	45	65	—	LS
	lb/day	63	94	—	94	136	—	
	% removal	85	—	—	68	—	—	
TSS	mg/L	45	65	—	45	65	—	NC
	lb/day	94	136	—	94	136	—	
	% removal	65	—	—	71	—	—	MS
pH	s.u.	6.5–9.0 all times			6.5–9.0 all times			NC
E. coli	no./100 mL	126	—	406	126	—	—	LS
Total Residual Chlorine (final)	mg/L	0.1	—	0.3	0.1	—	0.3	NC
	lb/day	0.3	—	0.7	0.3	—	0.7	
Pollutants with new limits in the 2020 permit								
Ammonia, Total as N	mg/L	---	---	---	8.6	—	22.4	MS
	lb/day	---	---	---	17.9	—	46.8	MS
Temperature	°C	---	---	---	See Table 9			MS
Pollutants with no limits in both the 2005 and 2020 permit								
Phosphorus, Total as P	mg/L	---	---	---	---	---	---	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

3.6.1 BOD_5

The 2005 permit BOD_5 limits were 30 mg/L average monthly, 45 mg/L average weekly, and 85% removal. BOD_5 has less stringent limits in the 2020 permit than in the 2005 permit.

According to IDAPA 58.01.25.200.02.b.i, new limits may be less stringent than previous permit limits if new information is available which was not available during the previous permit development and which would have justified the application of a less stringent effluent limitation. The 2005 fact sheet stated that the POTW did not qualify for reduced percent removal requirements for less concentrated influent because the poor BOD_5 removal efficiency may have been the result of I/I. In 2016, the City completed facility upgrades to repair the collection system to reduce I/I, to remove sludge accumulation, to reline all lagoons, raise dyke surfaces, install aerator anchors and mooring cables, replenish the banks with clay-shale mix, install a new backup generator, and install an awning over the final effluent weir. Since the completion of the facility upgrades, influent concentration data submitted by the City do not indicate dilute influent due to I/I, and the facility qualifies for equivalent to secondary treatment standards for BOD_5, as described in sections 2.1.7 and 3.2.

3.6.2 TSS

The 2005 permit had TSS limits of 45 mg/L monthly average, 65 mg/L weekly average, and 65% removal. The 2020 permit has the same TSS monthly average and weekly average limits, so it is at least as stringent, and there is no backsliding. The percent removal requirement for TSS in the 2020 permit is 71%, which is more stringent than the 2005 permit, so there is no backsliding.

3.6.3 pH

The 2005 permit limits for pH are the same as the 2020 permit limits for pH. There is no backsliding.

3.6.4 E. coli

The 2005 permit contains a maximum daily limit (i.e. single sample limit) of 406 organisms per 100 mL. This limit has been removed in the permit as per IDAPA 58.01.02.251.01.b. The water quality standards include the 406 organisms per 100 mL threshold as a trigger value for additional testing and not an effluent limit. This limit removal is allowed under anti-backsliding exceptions in IDAPA 58.01.25.200.03 since:

- The primary contact beneficial use is attained; and
- The resulting water quality effects are consistent with the state's anti-degradation policy.

3.6.5 Total Residual Chlorine

The TRC limits in the 2005 permit were 0.1 mg/L average monthly, and 0.3 mg/L maximum daily. The reasonable potential analysis conducted for the 2020 permit indicated that no TRC limit would be necessary. The 2005 permit's fact sheet provided critical low flows that appear to match the information provided by the USGS streamstats program, though specific data sources were not mentioned. The 2020 permit utilized the flow data (1939 – 2018) provided by the USGS stream gage near Cambridge to determine the critical low flows. The flow data from this gage is more representative of the actual flow than the streamstats program provides. Using the low flows calculated from the USGS stream gage, the reasonable potential analysis indicates that there is no potential to cause or contribute to an exceedance of water quality criteria for total residual chlorine when granted a mixing zone. The 2020 permit must retain limits at least as stringent as the previous permit, unless an exception to reduce limit stringency is met. The City

does not meet any of the exceptions in IDAPA 58.01.25.200; therefore, in order to prevent backsliding, the 2005 chlorine concentration and load limits have been retained.

3.6.6 Ammonia, Total as N

Ammonia, Total as N did not have a limit in the 2005 permit. The 2020 permit contains limits for Ammonia, Total as N that are consistent with the reasonable potential analysis. The 2020 permit is more stringent than the 2005 permit, and will not result in backsliding.

3.6.7 Temperature

Temperature was given a limit in the 2020 permit because of the TMDL WLA provided in the 2006 addendum to the Weiser River TMDL. The new permit limits comply with the TMDL WLA, are more stringent than the previous permit, and will not result in backsliding.

4 Monitoring Requirements

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

4.1 Influent Monitoring

Flow, TSS, and BOD_5 monitoring requirements are listed below in Table 16. Permittees have the option of taking more frequent samples than are required under the permit. These samples must be used for averaging if they are conducted using the EPA-approved test methods (generally found in 40 CFR 136) or as specified in the permit.

Table 16. Influent monitoring requirements for the 2020 permit.

Parameter	Monitoring Period	Units	Sample Frequency	Sample Type	Report	Reporting Period (DMR Months)
Flow	01/01 to 12/31	mgd	Continuous	Recording	Daily Maximum, Monthly Average	All Months (Jan - Dec)[a]
BOD_5	01/01 – 12/31	mg/L	2/month	Grab	Monthly Average	All Months (Jan - Dec)[a]
TSS	01/01 – 12/31	mg/L	2/month	Grab	Monthly Average	All Months (Jan - Dec)[a]

a. When the facility does not discharge during a month, it may report the appropriate No Data Indicator (NODI) code “C” on the monthly DMR.

4.1.1 Influent Monitoring Changes from the 2005 Permit

Monitoring frequency increased for Flow, BOD_5, and TSS relative to the 2005 permit. Changes in monitoring are presented in Table 17, below.

Table 17. Changes in Influent monitoring frequency from 2005 permit to the 2020 permit.

Parameter	2005 Permit	2020 Permit	Rationale
Flow	---	Continuous	Increased monitoring is required to confirm the I/I problem has been addressed and to know if it becomes an issue again.
BOD_5	1/month	2/month	Increased monitoring frequency will better confirm compliance with percent removal requirement.
TSS	1/month	2/month	Increased monitoring frequency will better confirm compliance with percent removal requirement.

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 18. The sampling location must be after the last treatment unit and prior to discharge to the receiving water. The samples must be representative of the volume and nature of the monitored discharge. If no discharge occurs during the reporting period, "no discharge" must be reported on the DMR.

Table 18. Additional Effluent Monitoring in the 2020 permit.

Parameter	Monitoring Period	Units	Sample Frequency	Sample Type	Report	Reporting Period (DMR Months)
E. coli	01/01 to 12/31	#/100 ml	5/month	Grab[a]	Instantaneous Maximum[b]	All Months (All Months)
Flow	01/01 to 12/31	mgd	Continuous	Recording	Monthly Average, Maximum Daily Average	All Months (All Months)
Phosphorus, Total as P	01/01 to 12/31	mg/L	1/quarter	Grab[a]	Monthly Average	Quarterly (March, June, September, December)

a. A grab sample is an individual sample collected over a 15-minute period or less.
b. Reporting is required within 24 hours of discovery of a single sample value greater than 406/100 ml. A value greater than this indicates likely exceedance of the geometric mean criterion, but is not by itself a violation of water quality standards or permit effluent limits.

4.2.1 Effluent Monitoring Changes from the 2005 Permit

Monitoring has increased for BOD_5, TSS, pH, temperature, and flow, and decreased for phosphorus, relative to the 2005 permit. Changes in monitoring are presented in Table 19.

Table 19. Changes in effluent monitoring frequency from 2005 permit to the 2020 permit.

Parameter	2005 Permit	2020 Permit	Rationale
BOD_5	1/month	2/month	Monitoring frequency increased to better confirm compliance with permit limits
TSS	1/month	2/month	Monitoring frequency increased to better confirm compliance with permit limits
pH	1/week	2/week	Monitoring frequency increased to better confirm compliance with permit limits
Temperature	---	Continuous	Increased monitoring due to new permit limits developed based on TMDL WLA
Flow	5/week	Continuous	Increased monitoring due to new permit limits developed based on TMDL WLA
Phosphorus, Total as P	1/month [a]	1/quarter	Quarterly monitoring for phosphorus, total as P will support TMDL 5 year review.

a. Phosphorus, Total as P monitoring was only required once per month for one year in the previous permit.

4.3 Receiving Water Monitoring

Table 20 presents the receiving water monitoring requirements for the permit. The City must establish receiving water monitoring at the identified locations. Receiving water monitoring results must be submitted with the DMR.

Table 20. Receiving water monitoring requirements in the 2020 permit.

Parameter	Monitoring Period	Units	Monthly Average	Instan-taneous Minimum	Instan-taneous Maximum	Daily Maximum	Maximum Daily Average	Sample Frequency	Sample Type	Reporting Period (DMR Months)
Flow	01/01 – 12/31	cfs	Report	—	—	Report	—	Continuous	Recorded	Monthly (All Months)[a]
Ammonia, Total as N	01/01 – 12/31	mg/L	Report	—	—	—	—	1/quarter[b]	Grab[c]	Quarterly (Mar, Jun, Sep, Dec)
Temperature	01/01 – 12/31	°C	—	—	—	—	Report	1/quarter[b]	Grab[c]	Quarterly (Mar, Jun, Sep, Dec)
pH	01/01 – 12/31	S.U.	—	Report	Report	—	—	1/quarter[b]	Grab[c,d]	Quarterly (Mar, Jun, Sep, Dec)
Phosphorus, Total as P	01/01 – 12/31	mg/L	Report	—	—	—	—	1/quarter[b]	Grab[c]	Quarterly (Mar, Jun, Sep, Dec)

a. Daily average receiving water flow will be reported via an excel spreadsheet and uploaded to the IDPES E-Permitting system. These data are due when DMR reports are due.
b. Quarters are defined as: January 1-March 31; April 1-June 30; July 1-September 30; and October 1-December 31.
c. Grab means an individual sample collected over a 15 minute, or less, period.
d. pH must be analyzed within 15 minutes of sample collection.

4.3.1 Receiving Water Monitoring Changes from the 2005 Permit

Monitoring frequency for phosphorus, total as P and flow has changed relative to the 2005 permit. Changes in monitoring are presented in Table 21.

Table 21. Changes in Receiving Water monitoring frequency from 2005 permit to the 2020 permit.

Parameter	2005 Permit	2020 Permit	Rationale
Flow	---	Continuous	Flow monitoring is required in order to determine compliance with the new temperature limits based on the TMDL WLA.
Phosphorus, total as P	1/month[a]	1/quarter	Quarterly monitoring will provide more data over a more representative time than once per month sampling for one year, and will support the five year TMDL review.

a. Monitoring shall be conducted once per month starting in January 2006 and lasting for one year.

4.4 Permit Renewal Monitoring

The permit renewal monitoring requires data be collected to characterize the effect of the effluent on the Weiser River. At a minimum, three samples of the final wastewater effluent for the parameters listed in Table 22 and Table 23 are required so that DEQ can assess the surface water impacts.

The City of Cambridge 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 22. Effluent monitoring required for all permit renewals.

Parameter	Units	Sample Type	Report
pH	s.u.	Grab	Minimum and maximum value
Flow	mgd	Continuous	Maximum daily value, average daily value, number of samples
Temperature[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	colonies/100 mL	Grab	

a. The permittee must collect during the middle month of the required quarters: (e.g. August for third quarter, November for fourth quarter, etc.)

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 23.

Table 23. Effluent testing required for permit renewals of facilities with flow greater than 0.1 mgd.

Parameter	Units	Sample Type	Report
Ammonia, Total (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	

An individual sample includes all parameters in Table 22 and Table 23. For parameters in which a grab sample must be collected, each sampling event consists of a minimum of four grab samples, analyzed individually.

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

- 2020: Fourth quarter (October – December)
- 2022: First quarter (January – March)
- 2023: Second quarter (April – June)

This schedule spreads monitoring over the permit effective period, as well as captures a range of seasons. In addition, the permittee must continue permit renewal effluent monitoring at a frequency of once every fifth quarter after the last sampling event listed in the schedule above until a new permit is issued.

5 Special Conditions

5.1 Compliance Schedule

IDAPA 58.01.25.305 and 40 CFR 122.47 allow for compliance schedules in IPDES permits to provide additional time for permittees to achieve compliance.

The permit includes compliance schedules for temperature and ammonia, total as N. The facility does not have sufficient data to determine whether it can comply with the final temperature limit. The compliance schedule provides time for the permittee to collect data to demonstrate compliance with the final effluent limits. If permit compliance is not immediately achievable, the compliance schedule outlines actions to take to meet permit temperature limits by 9/1/2030. The facility does not have sufficient data to determine whether it can comply with the final ammonia, total as N limits. The compliance schedule provides time for the permittee to collect data to demonstrate compliance with the final effluent limits. If permit compliance is not immediately achievable, the compliance schedule outlines actions to take to meet permit ammonia, total as N limits by 3/1/2026.

5.2 Nondomestic Waste Management

The permittee has nonsignificant, nondomestic (industrial/commercial) users, which are neither subject to the pretreatment standards in 40 CFR 405 through 471, nor meet any of the criteria of a significant industrial user (SIU) as specified in 40 CFR 403.3(v), and therefore, DEQ does not require an authorized pretreatment program. The permittee must ensure, through a sewer use ordinance, that pollutants from nondomestic wastes discharged to their system do not negatively

impact system operation or pass through the wastewater treatment facility. The permittee must not authorize indirect discharges of pollutants that would inhibit, interfere with, or otherwise be incompatible with operation of the wastewater treatment works, including interference with the use or disposal of municipal sludge.

5.3 Inflow and Infiltration Evaluation

The City must submit an I/I evaluation of the sewer collection system to DEQ through the IPDES E-Permitting system. The City completed a project to reduce I/I in 2016, but continued evaluation of I/I is necessary to ensure areas of the collection system that have not been maintained are not causing excess I/I.

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

6.1.2 Operation and Maintenance Manual

The permit requires City to properly operate and maintain all facilities and systems of conveyance, treatment, and control. Proper operation and maintenance is essential to meeting discharge limits, monitoring requirements, and all other permit requirements at all times. The permittee is required to maintain 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 and implement an emergency response plan that identifies measures to protect public health and the environment. At a minimum, the plan must include mechanisms for the following:

1. Ensure that the permittee is aware (to the greatest extent possible) of all overflows from portions of the collection system over which the permittee has ownership or operational control as well as any unanticipated treatment unit bypass or upset that may exceed any effluent limit in the permit.

2. Ensure that reports of an overflow or of an unanticipated bypass or upset that may exceed any effluent limit in this permit are immediately dispatched to appropriate personnel for investigation and response.
3. Ensure immediate notification to DEQ of any noncompliance that may endanger public health or the environment and identify the public health district and other officials who will receive immediate notification for items that require 24-hour.
4. Ensure that appropriate personnel understand, are appropriately trained on, and follow the Emergency Response Plan; and
5. Provide emergency facility operation.

7 Compliance with other DEQ Rules

7.1 Operator's License

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

7.2 Lagoon Seepage Testing

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

7.3 Sludge/Biosolids

DEQ separates wastewater and sludge permitting for the purposes of regulating biosolids. DEQ may issue a sludge-only permit to each facility at a later date, as appropriate.

Until future issuance of a sludge-only permit, sludge monitoring and disposal activities at each facility continue to be subject to the national sewage sludge standards at 40 CFR 503 and the requirements of Idaho's Wastewater Rules (IDAPA 58.01.16.480 and 650). The 503 regulations are self-implementing, and facilities must comply with them whether or not a permit has been issued. Idaho's Wastewater Rules require a POTW to have the capability to process sludge accumulated on site in preparation for final disposal or reuse (IDAPA 58.01.16.480 and 58.01.16.650). Operations of these sludge processing, storage, and disposal activities must comply with the facility's sludge management plan.

8 Permit Expiration

The permit will expire five years after the effective date.

8.1 Permit Modifications

DEQ may modify a permit before its expiration date only for causes specified in IDAPA 58.01.25.201. A modification other than a *minor modification* requires preparing a draft permit that incorporates the proposed changes, preparing a fact sheet, and conducting a public review period. Only the permit conditions subject to the modification will be reopened when a permit is modified. All other conditions of the existing permit remain in effect. Modifying a permit does not change the expiration date of the original permit.

9 References for Text and Appendices

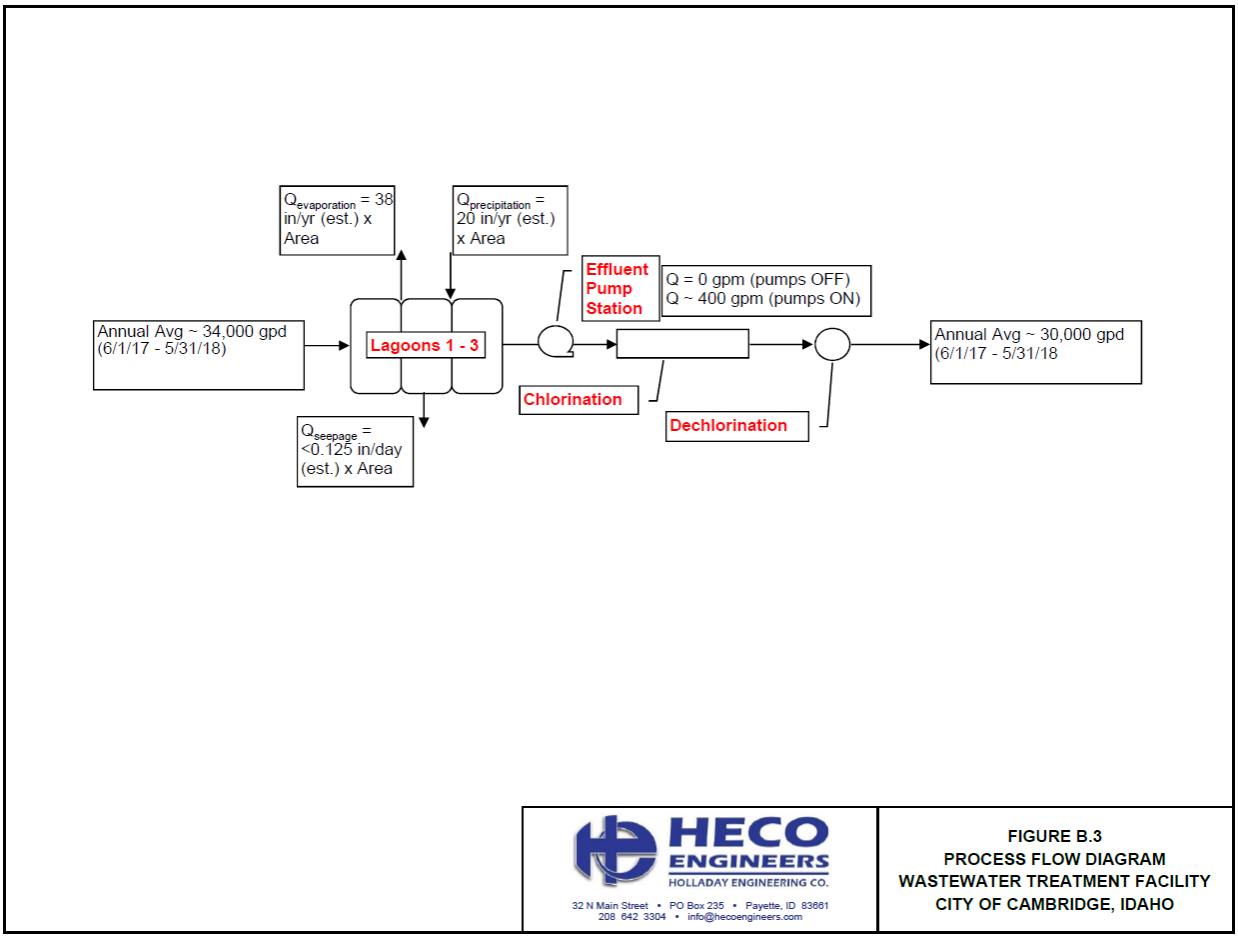
DEQ. 2017. *Effluent Limit Development Guidance*. Idaho Department of Environmental Quality. State Office. December 2017.

DEQ. 2006. *Weiser River Subbasin Temperature Total Maximum Daily Loads: Addendum to the Weiser River Subbasin Assessment and TMDL*. Idaho Department of Environmental Quality. State Office. June 2006.

DEQ. 2006. *Weiser River Watershed Subbasin Assessment and Total Maximum Daily Loads*. Idaho Department of Environmental Quality. State Office. July 2006

DEQ . 2016. *Idaho's 2016 Integrated Report*. Boise, ID: DEQ. *www.deq.idaho.gov/water-quality/surface-water/monitoring-assessment/integrated-report / https://www.deq.idaho.gov/media/60182296/idaho-integrated-report-2016.pdf*

Appendix A. Facility Maps/Process Schematics



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 concentration and removal rate limits for BOD_5 and TSS are the technology-based effluent limits of 40 CFR 133.102. As explained below, DEQ has determined that more stringent

WQBELs are necessary for pH, as well as E. coli, and ammonia, in order to ensure compliance with WQS.

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

DEQ uses the process in the *Effluent Limit Development Guidance* (DEQ 2017) to determine reasonable potential. 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 critieria 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 1. Simple mass-balance equation.

Where:

C_d = downstream receiving water concentration	Calculated value
Q_e = critical effluent flow	From discharge flow data (design flow for POTW)
Q_u = critical upstream flow (1Q10 acute criterion, 7Q10 chronic, or harmonic mean)	From water quality standards
%MZ = percent of critical low flow provided by 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 2. Dilution factor calculation.

Where: D_f = Dilution factor

Qs = Receiving water low-flow condition (cfs)

P = Mixing zone percentage

Qe = Effluent discharge flow (cfs)

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

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

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

Equation 3. CV calculation.

$$C_e = MOEC\ x\ RPMF$$

Equation 4. C_e calculation.

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

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

C. WQBEL Calculations
The following calculations demonstrate how the WQBELs in the permit were calculated. The permit includes WQBELs for pH, *E. Coli*, and total ammonia. The following discussion presents the general equations used to calculate the WQBELs.

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

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

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

Where:

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

Idaho's WQC for some metals are expressed as the dissolved fraction. 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 WLA in total recoverable metal that will be protective of the dissolved criterion. This is accomplished by dividing the WLA expressed as dissolved by the criteria translator. As discussed in *Guidance Document on Dynamic Modeling and Translators* (EPA 1993), the criteria translator (CT) is equal to the conversion factor when site-specific translators are not available. Conversion factors for metals criteria are listed in DEQ's Water Quality Standards (WQS) at IDAPA 58.01.02.210.02. The WQS also lists several guidance documents at IDAPA 58.01.02.210.04 that are recommended for the development of site specific translators.

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

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

Where:

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

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

Where:

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

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

Derive the Maximum Daily and Average Monthly Effluent Limits

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

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

Where:

LTA_m = Minimum long-term average value	Lesser value calculated from Equation 6 and Equation 7
e = Base of natural log	Approximately 2.718
σ = Square root of σ^2	
$\sigma^2 = Ln(CV^2+1)$	Ln is the natural log of base e
Z_{99} = z score of the 99th percentile of the normal distribution	2.326
CV = Coefficient of variation	See Equation 3.

$$AML = LTA_m \times e^{(z_{95}\sigma_n - 0.5\sigma_n^2)}$$ **Equation 9. Average monthly limit for toxics.**

Where:

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

Table 24, below, details the calculations for WQBELs.

Table 24. Reasonable Potential Analysis (RPA) and Water Quality Effluent Limit (WQBEL) Calculations

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

Facility Name	Cambridge
Facility Flow (mgd)	0.2500
Facility Flow (cfs)	0.38675

Critical River Flows	(IDAPA 58.01.02 03. b)	Annual Crit. Flows	Units
Aquatic Life - Acute Criteria - Criterion Max. Concentration (CMC)	1Q10	24.20000	cfs
Aquatic Life - Chronic Criteria - Criterion Continuous Concentration (CCC)	7Q10 or 4B3	27.90000	cfs
Ammonia	30B3/30Q10 (seasonal)		cfs
Human Health - Non-Carcinogen	30Q5	44.80000	cfs
Human Health - carcinogen	Harmonic Mean Flow		cfs

Receiving Water Data		Notes:	Annual
Hardness, as mg/L $CaCO_3$	Hardness, as mg/L $CaCO_3$	5th prctile at critical flow	25
Temperature, °C	Temperature, °C	90th - 95th percentile	17.3
pH, S.U.	pH, S.U.	90th - 95th percentile	8.734

Pollutants of Concern			AMMONIA, default: cold water, fish early life stages	CHLORINE (Total Residual)
Effluent Data	Number of Samples in Data Set (n)		7	10
	Coefficient of Variation (CV) = Std. Dev./Mean (default CV = 0.6)		0.6	0.016
	Effluent Concentration, µg/L (Max. or 95th Percentile) - (C_e)		7600	71
	Calculated 50th prctile Effluent Conc. (when n>10), Human Health Only			
Receiving Water Statistics	90th Percentile Conc., µg/L - (C_u)		40	0
	Geometric Mean, µg/L, Human Health Criteria Only			
Applicable Water Quality Criteria	Aquatic Life Criteria, µg/L	Acute	1,385.095	19.
	Aquatic Life Criteria, µg/L	Chronic	615.026	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
Assign Percent Mixing	Use this row to set the mixing zone size instead of letting it auto-calculate		25.00%	
Percent River Flow	Aquatic Life - Acute	1Q10	25.00%	4.57%
	Aquatic Life - Chronic	7Q10 or 4B3		7.85%
		30B3 or 30Q10		--
	Human Health - Non-Carcinogen and Chronic Ammonia	Harmonic Mean	25.00%	--
	Human Health - Carcinogen	Harmonic Mean		--
Calculated Dilution Factors (DF) (or enter Modeled DFs)	Aquatic Life - Acute	1Q10	16.64	3.86
	Aquatic Life - Chronic	7Q10 or 4B3		6.66
		30B3 or 30Q10		--
	Human Health - Non-Carcinogen and Chronic Ammonia	Harmonic Mean	29.96	--
	Human Health - Carcinogen	Harmonic Mean		--

Aquatic Life Reasonable Potential Analysis

σ	$\sigma^2=\ln(CV^2+1)$		0.555	0.016
P_n	$=(1-\text{confidence level})^{1/n}$, where confidence level =	99%	0.518	0.631
Multiplier (TSD p. 57)	$=\exp(z\sigma-0.5\sigma^2)/\exp[\text{normsinv}(P_n)\sigma-0.5\sigma^2]$, where	99%	3.5	1.0
Statistically projected critical discharge concentration (C_e)			26928	73.30
Predicted max. conc.(ug/L) at Edge-of-Mixing Zone		Acute	1656	19.00
(note: for metals, concentration as dissolved using conversion factor as translator)		Chronic	938	11.00
Reasonable Potential to exceed Aquatic Life Criteria			**Yes**	**No**

Aquatic Life Effluent Limit Calculations

Number of Compliance Samples Expected per month (n)			4	
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)		0.600	0.016
Permit Limit Coeff. Var. (CV), decimal	(Use CV from data set or default = 0.6)		0.600	0.016
Acute WLA, ug/L	$C_d = (\text{Acute Criteria} \times MZ_a) - C_u \times (MZ_a-1)$	Acute	22,427	--
Chronic WLA, ug/L	$C_d = (\text{Chronic Criteria} \times MZ_c) - C_u \times (MZ_c-1)$	Chronic	17,267	73.3
Long Term Ave (LTA), ug/L	WLAc x $\exp(0.5\sigma^2-z\sigma)$, Acute	99%	7,199	--
(99^{th} % occurrence prob.)	WLAa x $\exp(0.5\sigma^2-z\sigma)$; ammonia n=30, Chronic	99%	13,473	71.9
Limiting LTA, ug/L	used as basis for limits calculation		7,199	71.9
Applicable Metals Criteria Translator (metals limits as total recoverable)				--
Average Monthly Limit (AML), ug/L , where % occurrence prob =		95%	**8,565**	--
Maximum Daily Limit (MDL), ug/L , where % occurrence prob =		99%	**22,427**	--
Average Monthly Limit (AML), mg/L			**8.6**	--
Maximum Daily Limit (MDL), mg/L			**22.4**	--
Average Monthly Limit (AML), lb/day			**17.858**	--
Maximum Daily Limit (MDL), lb/day			**46.760**	--

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. 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 and Public Comments

A. Public Involvement Information

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

DEQ placed a Public Notice of Draft on 04/29/2020 in the Upper Country New Reporter to inform the public and to invite comment on the draft Idaho Pollutant Discharge Elimination System permit and fact sheet.

The notice:

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

B. Public Comments and Response to Comments

Idaho Pollutant Discharge Elimination System Discharge Permit No. ID0021806 Response to Comments on Draft City of Cambridge IPDES Permit

May 29, 2020 comment deadline

City of Cambridge, May 11, 2020 Letter

1. Permit Page 2 of 40, Submission Schedule –

The City requests that all initial submittal dates listed in this table and the tables in Section 3.1 be extended by one year to allow the City time to budget for the expenses related to each submittal item. These submittals represent a significant cost that must be budgeted for.

Response 1: DEQ concurs that funding for continuous temperature monitoring may require time to determine how to budget.

Changes to draft permit: Added an intermediate progress report to detail how funding is intended to be obtained due on March 1, 2021, and extended all other submittals associated with the compliance schedule for temperature by one year.

2. Permit Page 7 of 40, Table 2 –

The City requests that the effluent limits for Total Residual Chlorine (TRC) be removed since the reasonable potential analysis discussed in the Fact Sheet sections 3.3.3.3 and 3.6.5 indicates that there is no reasonable potential to cause or contribute to an exceedance of water quality criteria for total residual chlorine when granted a mixing zone. Dechlorination requires significant operation and maintenance costs for the City and the City has limited resources available to meet other new requirements of the Draft Permit. Fact Sheet section 3.6.5 states "The reasonable potential analysis conducted for the 2020 permit indicated that no TRC limit would be necessary."

Response 2: The City is correct that the results of the reasonable potential analysis indicate no limit for total residual chlorine is necessary in the 2020 permit, as explained in the fact sheet section 3.6.5. However, IDAPA 58.01.25.200.02 requires permits not be reissued with limits less stringent than the previous permit, unless a specific exception is met. The fact sheet explains that the City does not qualify for any of the backsliding exceptions; therefore, the total residual chlorine limit is maintained in this permit.

Changes to draft permit: None.

Changes to draft fact sheet: Added further explanation for maintaining previous permit limits for total residual chlorine to section 3.6.5

3. Pages 7 and 11 of 40, Influent and Effluent Monitoring –

The City requests clarifications and revision of the Draft Permit language to indicate that the influent and effluent monitoring in Tables 2, 5, and 6 is only required for months which effluent discharges from the POTW to Outfall 001. There are typically several months each year with no discharge. Monitoring and testing during months of no discharge represent significant additional cost to the City and ratepayers.

Response 3: The 2020 permit is written in a manner similar to the previous permit, allowing year round discharge. If the permittee's operations do not include discharge during a portion of the year, they may indicate the appropriate No Data Indicator (NODI) code on their Discharge Monitoring Reports.

Changes to draft permit: Added a footnote to Table 2 and Table 5 clarifying to use the appropriate NODI code when the permittee does not discharge.

4. Page 9 of 40, Temperature –

   How can temperature monitoring at Outfall 001 be performed during the days and months with no discharge? The City requests clarification that temperature monitoring at Outfall 001 is only required when discharging.

Response 4: See Response 3.

Changes to draft permit: Added a footnote to Table 3 clarifying to use the appropriate NODI code when the permittee does not discharge.

5. General Comment –

   The City of Cambridge POTW does not operate as a "Continuous Discharge" facility throughout the entire year as defined in IDAPA 58.01.25. The POTW historically discharges during some months of the year and does not discharge during other months. Do the proposed permit limits allow for continued operation of the facility with no discharge during some months of the year?

Response 5: The definition of "Continuous Discharge" at IDAPA 58.01.25.10.20 states that it is "a discharge which occurs without interruption throughout the operating hours of the facility, except for infrequent shutdowns for maintenance, process changes, or other similar activities."

DEQ understands that during the months when the City is discharging, the discharge is continuous. This is consistent with the previous permit as well. If the City does not discharge during a month, it may report the appropriate No Data Indicator (NODI) code indicating that discharge did not occur during that month.

Changes to draft permit: None.