Fact Sheet for IPDES Permit No. ID0026310

03/13/2020

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:

Viola Water and Sewer District
Trestle Road
Viola, ID 83872

Public Comment Start Date:	01/10/2020
Public Comment Expiration Date:	02/10/2020
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Purpose of this Fact Sheet

This fact sheet explains and documents the decisions the Idaho Department of Environmental Quality (DEQ) made in writing the Idaho Pollutant Discharge Elimination System (IPDES) permit for Viola Water and Sewer District.

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

Table of Contents

List of Tables

Acronyms

1Q10	1-day, 10 year low flow
7Q10	7-day, 10 year low 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
°C	Degrees Celsius
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
CV	Coefficient of Variation
CWA	Clean Water Act
DEQ	Idaho Department of Environmental Quality
DMR	Discharge Monitoring Report
EPA	U.S. Environmental Protection Agency
IDAPA	Refers to citations of Idaho administrative rules
IDWR	Idaho Department of Water Resources
I/I	Inflow and Infiltration
IPDES	Idaho Pollutant Discharge Elimination System
lbs/day	Pounds per day
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
TSD	Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001)
TSS	Total suspended solids
USGS	United States Geological Survey
WLA	Wasteload allocation
WQBEL	Water quality-based effluent limit
WQC	Water Quality Criteria
WQS	Water Quality Standards
WWTF	Wastewater treatment facility

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 Viola Water and Sewer District. This fact sheet complies with the Rules Regulating the Idaho Pollutant Discharge Elimination System Program (IDAPA 58.01.25), which requires DEQ to prepare a permit and accompanying fact sheet for public evaluation before issuing an IPDES permit.

DEQ proposes to reissue the IPDES permit for the Viola Water and Sewer District wastewater treatment facility (WWTF). 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, 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 permit must do so in writing within 14 calendar days of public notice being published that a permit has been prepared; requests for public meetings must be submitted to DEQ by 01/24/2020. 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, please see the IPDES guidance *Public Participation in the Permitting Process* at "*http://www.deq.idaho.gov/media/60178029/ipdes-public-participation-permitting-process-0216.pdf"*. For more information, please contact the permit writer.

After the close of the public comment period, DEQ considers information provided by the public, prepares a document summarizing the public comments received, and may make changes to the permit in response to the public comments. DEQ will include the summary and responses to comments in 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 permit to develop and document specific grounds for objections to a

proposed permit. If EPA objects to a proposed permit DEQ must satisfactorily address the objections within the time period specified in the memorandum of agreement between EPA and DEQ (40 CFR 123.44). Otherwise, EPA may issue a permit in accordance with 40 CFR 121, 122, 124. If EPA issues the permit, any state, interstate agency, or interested person may request EPA hold a public hearing regarding the objection.

Permit Issuance

Following the public comment period(s) on a permit and after receipt of any comments on the proposed permit from EPA, DEQ will issue a final permit decision, the final permit, and 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 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 permits are also available at the DEQ Regional Office:

DEQ Lewiston Regional Office
1118 F Street
Lewiston, ID 83501

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	Viola Water and Sewer District
Facility Physical Address	Trestle Road, Viola, ID 83872
Facility Mailing Address	P.O. Box 13, Viola, ID 83872
Facility Contact	Jason Wereley (208) 659-5471
Responsible Official	Buck Taggart
Facility Location	Latitude: 46.829438° Longitude: -117.035325°
Receiving Water Name	Fourmile Creek
Outfall Location	Latitude: 46.828657° Longitude: -117.035544°
Permit Status	
Application Submittal Date	August 21, 2008
Date Application Deemed Complete	October 28, 2008

The Viola Water and Sewer District owns the Viola Publicly Owned Treatment Works (POTW) ocated in Viola, Idaho. The collection system has no combined sewers. The facility serves a resident population of 164 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 0.06 mgd. The treatment process consists of waste stabilization onds, chlorination, and dechlorination. Details about the wastewater treatment process and a map showing the location of the treatment facility and discharge are included in Appendix A. Because of a low design flow and lack of industries, the facility is considered a minor facility.

The WWTF consists of two waste stabilization ponds. Wastewater first enters Cell # 1 on the east side of the property from Lift Station #1. During most of the year wastewater flows from Cell #1 to Cell #2, west of Cell #1. During the spring, when discharging, the facility isolates one of the cells and allows wastewater to stabilize. Stabilized wastewater is then routed through the chlorine contact chamber, dechlorinated, and discharged to Fourmile Creek. The facility is authorized to discharge from February 15th through April 30th.

2.1.2 Permit History

The facility was constructed in the 1980s. The facility was last permitted on March 15, 2004. The permit has been administratively continued since February 28, 2009. A lagoon seepage test procedure was approved by DEQ on July 14, 2014 and the test was completed and passed in September 2014.

2.1.3 Compliance History

The facility was inspected by DEQ for NPDES permit compliance on December 20, 2011, and y EPA Region 10 for NPDES permit compliance on March 10, 2017. Routine monitoring compliance samples are taken to Anatek Laboratory in Moscow for analysis.

The 2017 inspection encompassed the wastewater treatment process, records review, operation and maintenance, and the collection system. The inspection findings describing effluent limit violations (Table 2), a lack of records retention, and lack of onsite quality assurance project plan (QAPP). EPA sent a notice of violation to the Facility regarding the findings in December 2017. A compilation of limit violations from DMRs is included below. Violations for late or unsubmitted DMR's are not included.

Table 2. Effluent limit violations.

Parameter Exceeding Permit Limits	Limit	Units	Number of Instances
BOD_5	Monthly Average	lb/day	1
BOD_5	Percent Removal	%	5
TSS	Monthly Average	mg/l	3
TSS	Monthly Average	lb/day	4
TSS	Weekly Average	lb/day	1
TSS	Percent Removal	%	8
pH	Maximum	s.u.	2

2.1.4 Sludge/Biosolids

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

Sludge has not been removed from the WWTF lagoons since its construction. There are no known sludge monitoring data.

2.1.5 Outfall Description

The outfall to Fourmile Creek is immediately northeast of the entrance bridge over the creek. The outfall is usually submerged during the discharge season.

2.1.6 Wastewater Influent Characterization

Viola WWTF reported the concentration of influent pollutants in Discharge Monitoring Reports (DMRs) and results are characterized in Table 3. The tabulated data represents the quality of the influent wastewater received from April 2004 to April 2019.

Table 3. Wastewater influent characterization.

Parameter	Units	# of Samples	Average Value	Maximum Value
BOD_5	mg/L	20	419	3,025
BOD_5	lb/day	20	102	908
TSS	mg/L	20	1,422	19,450
TSS	lb/day	20	342	5,190

The March 2016 influent data were orders of magnitude higher than values given in Table 3. These influent monitoring results were deemed unrepresentative outliers as the wet well they were sampled from was clogged. The wet well was subsequently cleaned out.

2.1.7 Wastewater Effluent Characterization

The Viola WWTF reported the effluent pollutant concentrations in DMRs and results are characterized in Table 4. The tabulated data represents the quality of the effluent discharged from April 2004 to April 2019.

Table 4. Wastewater effluent characterization.

Parameter	Units	# of Samples	Average Values	Maximum Values
BOD_5 Monthly	mg/L	21	8.0	19
BOD_5 Weekly	mg/L	21	9.2	26
BOD_5 Monthly	lb/day	21	6.1	22
BOD_5 Weekly	lb/day	21	6.7	22
BOD_5 % Removal	%	21	88	34.9 (minimum)
TSS Monthly	mg/L	21	15.9	41
TSS Weekly	mg/L	21	19.0	41
TSS Monthly	lb/day	21	9.4	26
TSS Weekly	lb/day	21	11.1	26
TSS % Removal	%	21	77	14.6 (minimum)
E. coli geometric mean	#/100mL	21	2.6	23
E. coli instantaneous maximum	#/100mL	21	4.3	25
TRC Monthly	mg/L	19	0.017	0.06
TRC Daily Maximum	mg/L	18	0.024	0.06
TRC Monthly	lb/day	18	0.011	0.04
TRC Daily Maximum	lb/day	17	0.015	0.05
Ammonia Monthly	mg/L	20	2.3	10.4
Ammonia Daily Maximum	mg/L	20	2.5	10.4
Ammonia Monthly	lb/day	20	1.2	3.30
Ammonia Daily Maximum	lb/day	20	1.4	4
Parameter	**Units**	**# of Samples**	**Minimum Value**	**Maximum Value**
pH	std units	40	6.8	9.3

2.2 Description of Receiving Water

The Viola WWTF discharges to Fourmile Creek in the Palouse Subbasin (HUC ID17060108) water body unit C-7B Fourmile Creek – T40N, R5W Section 5 to Idaho/Washington border. At the point of discharge, Fourmile Creek is protected for the following designated uses (IDAPA 58.01.02.120.01):

- Coldwater aquatic life
- Secondary contact recreation

According to DEQ's 2016 Integrated Report, the aquatic life use in this receiving water body AU is unassessed. For unassessed uses DEQ must provide an appropriate level of protection on a case-by-case basis using information available at the time of permit issuance (IDAPA 58.01.02.052.05.b).

The outfall is located directly upstream of the entrance bridge to the WWTF. A large culvert runs under the entrance to the WWTF and Fourmile creek continues flowing southwest. For more information on the outfall see 2.15 Outfall Description in this document. There are no nearby point sources. Nearby nonpoint sources of pollutants include agriculture. There are no water intakes. 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 2017 and 2019 permittee monitoring.

Table 5. Ambient background data.

Parameter	Units	Percentile	Value
Temperature	°C	Maximum	12.8
pH	Standard units	Minimum-Maximum	8.0-8.6
Ammonia	mg/L	Maximum	0.05

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.

At the time of permit issuance there were no listed impairments or TMDLs in Idaho or Washington for Fourmile Creek, however, the aquatic life use remains unassessed in both states.

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. The harmonic mean is a long-term mean flow value calculated by dividing the number of daily flow measurements by the sum of the reciprocals of the flows. The 30Q10 represents the lowest average 30 consecutive day flow with a recurrence frequency of once in 10 years.

Table 6. Low flow design conditions.

Criteria	Flow Condition	Critical Flow (cfs)
Acute aquatic life	1Q10	1.47
Chronic aquatic life	7Q10	2.90
Non-carcinogenic human health criteria and ammonia	30Q5	9.32
Carcinogenic human health criteria	Harmonic Mean	12.48

The previous fact sheet notes that the stream only runs six months out of the year. The following information is from the 2004 fact sheet.

> *In a phone conversation on September 3, 2003, the applicant stated that the stream flows from approximately January through July of each year. The application listed the season of discharge as January through April of each year.*
>
> *Daily streamflow data for Fourmile Creek were collected by the Unites States Geological Survey (USGS) at a station downstream of the outfall near Shawnee, Washington (station #13349000) between 1934 and 1940. These data were generally in agreement with the applicant's statements about the season when the stream flows, however, the stream had no flow between January 8 and February 11 of 1937.*
>
> *In order to guarantee dilution from the receiving stream, the season of discharge has been restricted to a period between February 15 and April 30 of each year. Since data for Fourmile Creek were only available for a short period of time and a minimum of 10 years of data are necessary for direct calculation of critical flows, the Maintenance of Variance Extension, Type 1 (MOVE.1) method (Hirsch, 1982) was used to extend the stream flow record by correlation to a long term stream flow monitoring station in the same basin. A USGS station on Missouri Flat Creek in Pullman, Washington (station #13348500) was chosen for the strong correlation of the parallel data to the Fourmile Creek station, and its long period of daily flow records (1934-1940 and 1960-1979). Based on the MOVE.1 results, the critical low flows of Fourmile Creek during the discharge season are a 1Q10 of 1.13 mgd [1.75 cfs] and a 7Q10 of 1.59 mgd [2.50 cfs]. Water quality-based effluent limits were based on these critical flows.*

There are no new data for the Shawnee and Missouri Flat Creek USGS stations. The MOVE.1 method was repeated with the data described above since a 30Q5 critical condition was necessary to calculate an ammonia reasonable potential analysis (RPA). The MOVE.1 method was the same as done in the previous permit, however, a more up-to-date version of DFLOW in the EPA BASINS 4.1 program was used to calculate the critical flows of the Missouri Flat Creek station. The critical flows vary slightly from the previous permit due to this technological upgrade. The estimated low flows are presented in Table 6.

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, and the facility's industrial user surveys. The wastewater treatment process for this facility includes waste stabilization and chlorination. Pollutants expected in the discharge from a facility with this type of treatment are:

- TSS
- BOD5
- E. coli bacteria
- TRC
- pH
- ammonia
- phosphorus

3 Effluent Limits and Monitoring

Table 7 presents the effluent limits and monitoring requirements in the 2004 Permit. Table 8 presents the effluent limits and monitoring requirements in the 2020 permit.

Table 7. 2004 Permit - Effluent Limits and Monitoring Requirements

Parameter	Effluent Limits				Monitoring Requirements		
	Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit	Instantaneous Maximum Limit	Sample Location	Sample Frequency	Sample Type
Flow, mgd	—	—	—	—	Effluent	1/week	Measure
BOD_5	30 mg/L	45 mg/L	—	—	Influent and Effluent	1/week	Grab
	16 lb/day	24 lb/day	—	—			
TSS	30 mg/L	45 mg/L	—	—	Influent and Effluent	1/week	Grab
	16 lb/day	24 lb/day	—	—			
E. coli [1,2]	126/100mL	—	—	576/100mL	Effluent	5/month	Grab
TRC (until 03/31/07)[2]	0.5 mg/L	0.75 mg/L	—	—	Effluent	1/week	Grab
	0.26 lb/day	0.39 lb/day	—	—			
TRC (after 04/01/07)[2,3]	0.052 mg/L	—	0.10 mg/L	—	Effluent	1/week	Grab
	0.027 lb/day	—	0.053 lbs/day	—			
Total Ammonia as N, mg/L	—	—	—	—	Effluent	1/month	Grab

1. The average monthly *E. coli* bacteria counts must not exceed a geometric mean of 126/100 ml based on a minimum of five samples taken every 3-5 days within a calendar month. See Part V for a definition of geometric mean.
2. Reporting is required within 24 hours of a maximum daily limit or instantaneous maximum limit violation.
3. The average monthly concentration limit for chlorine are not quantifiable using EPA approved test methods. The permittee will be in compliance with the effluent limits for chlorine provided the average monthly chlorine residual levels are at or below the compliance evaluation level of 0.1 mg/L, with a loading at or below 0.053 lbs/day.
4. Ammonia monitoring shall begin with the first year of the permit and continue for four years.

The 2004 permit also required:

- The pH range shall be between 6.5 and 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 Requirements for BOD_5 and TSS: For each month, the monthly average effluent concentration shall not exceed 15 percent of the average monthly influent concentration. Percent removal of BOD_5 and TSS shall be reported on the Discharge Monitoring Reports (DMRs). The monthly average percent removal shall be calculated from the monthly arithmetic mean of the influent value and the monthly arithmetic mean of the effluent value. Influent and effluent samples must be taken over approximately the same time period.

Table 8. Pollutants with effluent limits and monitoring requirements for Outfall 001.

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)	02/15 to 04/30	mg/L	30	45	—	—	—	—	Grab[a]	1/week	Monthly (Feb, March, April)
		lb/day	16	24	—	—	—	—	Calculation[b]		
BOD_5 Percent Removal	02/15 to 04/30	%	85 (minimum)	—	—	—	—	—	Calculation[c]	1/month	
Total Suspended Solids (TSS)	02/15 to 04/30	mg/L	30	45	—	—	—	—	Grab[a]	1/week	Monthly (Feb, March, April)
		lb/day	16	24	—	—	—	—	Calculation[b]		
TSS Percent Removal	02/15 to 04/30	%	85 (minimum)	—	—	—	—	—	Calculation[c]	1/month	
E. coli[d,e]	02/15 to 04/30	#/100 ml	—	—	126[f]	—	—	—	Grab[a]	5/month	Monthly (Feb, March, April)
pH[g]	02/15 to 04/30	std. units	—	—	—	6.5	9.0	—	Grab[a]	1/week	Monthly (Feb, March, April)
TRC[g]	02/15 to 04/30	mg/L	0.041[h]	—	—	—	—	0.094	Grab[a]	1/week	Monthly (Feb, March, April)
		lb/day	0.021	—	—	—	—	0.047	Calculation[b]		
Total Ammonia as N[g, i]	02/15 to 04/30	mg/L	2.2	—	—	—	—	8.6	Grab[a]	1/week	Monthly (Feb, March, April)
		lb/day	1.1	—	—	—	—	4.3	Calculation[b]		

a. A grab sample is an individual sample collected over a 15-minute period or less.
b. 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
c. % Removal= ([Influent](mg/L)-[Effluent](mg/L))/([Influent](mg/L))×100%, Braces "[ ]" indicate concentration of the attribute contained inside
d. Idaho's water quality standards for secondary contact recreation include a single sample value of 576 #/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 five samples taken every 3 – 7 days within a calendar month.
f. If an *E. coli* geometric mean of five samples taken every 3 – 7 days within a calendar month is not possible (i.e. February), use an applicable no data indicator (NODI) Code.
g. Exceedance of a maximum daily limit, instantaneous maximum limit, or instantaneous minimum limit requires 24-hour reporting in accordance with 2.2.7. For *E. coli*, the maximum daily threshold that triggers 24-hour reporting 576 #/100 mL. Please see 2.2.7 for additional 24-hour reporting requirements.
h. The limits for chlorine are not quantifiable using EPA-approved analytical methods. The minimum level (ML) for chlorine is 50 µg/L for this parameter. DEQ will use 50 µg/L as the compliance evaluation level for this parameter. The permittee will be compliance with the total residual chlorine limits if the average monthly concentration is less than 50 µg/L and the average monthly mass loadings are less than 0.026 lbs/day. For purposes of calculating the monthly averages, see Section 2.2.2 of this permit.
i. This effluent limit is subject to a compliance schedule as described in Section 3.1 of the permit.

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 these limits to each POC. These limits are described below.

3.2 Technology-Based Effluent Limits

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

Table 9. Secondary treatment effluent limits.

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

The 2004 permit states it did not calculate equivalent to secondary treatment standards because *"the facility has not yet discharged, there are no data for the performance of this facility that justify the use of equivalent-to-secondary limits."*

The facility does not meet 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 the 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 10.

Table 10. 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 the three criteria are explained below:

Rationale for failing criterion (1) from 40 CFR 133.101(g) above:

The facility has been operated properly over the last five years under a new wastewater operator, hus the last five years of data were used to evaluate the need for equivalent to secondary treatment standards. The permittee receives influent throughout the calendar year, however, only discharges from February 15 through April 30. Since the last permit was issued, this residence time can result in % removal values lower than 85%. Excess I&I is not expected to be an issue, as the small system does not have capacity issues when it is not discharging. When the facility is operated correctly, monthly and weekly secondary standards are not exceeded (see Table 11).

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

The facility treatment uses a stabilization pond as the principal process.

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

Significant biological treatment is achieved. The minimum BOD_5 percent removal observed was 5.1%, with a 30-day average of 88%.

Due to the fact that not all conditions in 40 CFR 133.101(g) are met, the facility is not eligible for the "treatment equivalent to secondary treatment" standards found in 40 CFR 133.105. Data from 2015 through 2019 were used for this analysis.

Table 11. Analysis of Treatment Equivalent to Secondary Treatment

BOD_5 Criteria 1		Criteria 3	TSS Criteria 1	
BOD_5 Monthly Average	**BOD_5 Weekly Average**	**BOD % Removal**	**TSS Monthly Average**	**TSS Weekly Average**
95th percentile = 4 mg/L	1.5 X BOD_5 Monthly Average = 6 mg/L	95th percentile = 97	95th percentile = 23 mg/L	1.5 X TSS Monthly Average = 34.5 mg/L
To meet Treatment Equivalent to Secondary conditions (1) and (3) the data must show:				
>30 mg/L	> 45 mg/L	>65% removal	>30 mg/L	> 45 mg/L
Does data meet criteria (1) or (3) of Treatment Equivalent to Secondary Treatment?				
NO	NO	YES	NO	NO

The facility does not qualify for equivalent to secondary treatment standards.

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 0.063 mgd, the technology-based mass limits for:

BOD_5:

Average Monthly Limit = 30 mg/l × 0.063 mgd × 8.34 = 16 lbs/day

Average Weekly Limit = 45 mg/l × 0.063 mgd × 8.34 = 24 lbs/day

TSS:

Average Monthly Limit = 30 mg/l × 0.063 mgd × 8.34 = 16 lbs/day

Average Weekly Limit = 45 mg/l × 0.063 mgd × 8.34 = 24 lbs/day

3.3 Water Quality-Based Effluent Limits

3.3.1 Statutory and Regulatory Basis

Section 301(b)(1)(C) of the Clean Water Act (CWA) requires the development of limits in permits necessary to meet WQS. The IPDES regulation IDAPA 58.01.25.302.06 implementing Section 301(b)(1)(C) of the CWA requires that permits include limits for all pollutants or parameters that are or may be discharged at a level that will cause, have the reasonable potential to cause, or contribute to an excursion above any WQS including narrative criteria for water

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

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 proposed mixing zones for this facility's pollutants are summarized in Table 12. The calculated mixing zones do not impede receiving water beneficial uses. At the mixing zone percentages below and corresponding limits there are no reasonable potentials to cause or contribute an exceedance of WQS.

Table 12. Authorized mixing zones for Viola WWTF.

Pollutant	Discharge Period	Authorized Mixing Zone (% of Critical Low Flow)			
		Aquatic Life		Human Health	
		Acute (1Q10)	Chronic (7Q10 for TRC, 30Q5 for ammonia)	Water and Fish (30Q5 or Harmonic Mean)	Fish Only (30Q5 or Harmonic Mean)
TRC	02/15 to 04/30	25% of 1.47 cfs	25% of 2.90 cfs	NA	NA
Ammonia, Total as N	02/15 to 04/30	25% of 1.47 cfs	12% of 9.32 cfs	NA	NA

DEQ also calculated dilution factors for seasonal critical low flow conditions. All dilution factors are calculated with the effluent flow rate set equal to the design flow of 0.063 mgd (IDAPA 58.01.02.060.01.c).

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 Washington WQS[ii] are taken into consideration due to the proximity of the discharge to the Washington state line in accordance with 40 CFR 122.4(d). The calculations are provided in Appendix B.

3.3.3.1 Ammonia

The water quality standards of Washington and Idaho contain identical water quality criteria to protect aquatic life, including salmonids, against short term and long term adverse impacts from ammonia. Ammonia criteria are based on a formula that relies on the pH and temperature of the receiving water. Because the fraction of ammonia present as the toxic, un-ionized form increases with increasing pH and temperature, the criteria become more stringent as pH and temperature increase. The table below details the equations used to determine WQC for ammonia.

[ii] Washington's water quality standards are codified in Water Quality Standards for Surface Waters of the State of Washington (Chapter 173-201A WAC)

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):	9.8
2. Receiving Water pH:	8.30
3. Is the receiving water a cold water designated use?	Yes
4. Are non-salmonid early life stages present or absent?	Present
OUTPUT	
Total ammonia nitrogen criteria (mg N/L):	
Acute Criterion (CMC)	**3.15**
Chronic Criterion (CCC)	**1.52**

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

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

Even with a 25% mixing zone ammonia had a reasonable potential to cause to contribute to an acute water quality exceedance, and limits are necessary (at the acute low flow of 1Q10). Given a 12% mixing zone, ammonia no longer has potential to cause or contribute to a chronic water quality exceedance (at the chronic low flow of 30Q5). See Appendix B for reasonable potential and effluent limit calculations for ammonia.

DEQ's *Effluent Limit Development Guidance* states that DEQ will use the 90th to 95th percentile of the ambient upstream receiving water temperature and pH to calculate ammonia criteria. Because the two years of receiving water data were available, DEQ determined that the maximum value of temperature and pH were appropriate for the ammonia calculation.

The ammonia limits are new in this permit, and it is unknown whether or not the facility can comply with the limits. The facility does not have sufficient data to determine if limits can be met, or if an interim limit is appropriate. During the first three years of this permit, the facility will gather data and evaluate if permit compliance is already achievable. If permit compliance is not immediately achievable, each compliance schedule outlines actions to take to meet permit limits by 2029.

3.3.3.2 E. coli and Fecal Coliform

The Idaho WQS states that waters of the State of Idaho that are designated for recreation (primary or secondary) are not to contain *E. coli* bacteria in concentrations exceeding a geometric mean of 126 organisms per 100 ml based on a minimum of five samples taken every three to seven days over a 30-day period. A mixing zone is not appropriate for bacteria for waters designated for contact recreation. 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. Weekly monitoring of the effluent will ensure compliance with the criterion can be assessed. If the single sample maximum is exceeded, the

permittee may choose to monitor more frequently to ensure adequate disinfection and compliance with permit effluent limits. Regulations at IDAPA 58.01.25.303.04 require that effluent limits for continuous discharges from POTWs be expressed as average monthly and average weekly limits, unless impracticable. Additionally, the terms average monthly limit and average weekly limit are defined in IDAPA 58.01.25.10.06 and 07 respectively as being arithmetic (as opposed to geometric) averages. It is impracticable to properly implement a 30-day geometric mean criterion in a permit using monthly and weekly arithmetic average limits. The geometric mean of a given data set is equal to the arithmetic mean of that data set if and only if all of the values in that data set are equal. Otherwise, the geometric mean is always less than the arithmetic mean.

Fourmile Creek is designated for primary contact recreation in the State of Washington. The Washington water quality standards require that waters designated for primary contact recreation are not to contain fecal coliform bacteria in concentrations exceeding:

- A single sample of 200 fecal coliform organisms per 100 ml; or
- A geometric mean of 100 fecal coliform organisms per 100 ml

Since *E. coli* bacteria are a type of fecal coliform bacteria, the concentration of fecal coliform bacteria will be greater than or equal to the concentration of *E. coli* bacteria in any given sample. There is no a mixing zone for bacteria. At a minimum, the effluent must meet the Idaho water quality criterion before it is discharged to the receiving water.

A reasonable potential analysis was conducted to determine if the discharge has a reasonable potential to violate Washington's water quality criteria for fecal coliform at the state line. The following assumptions were made for this analysis: the discharge from the Viola WWTF will be completely mixed with the receiving stream at the Washington state line, there will be no decay of bacteria between the discharge and the state line, the upstream density of fecal coliform bacteria in Fourmile Creek is zero, and the highest concentration of *E. coli* bacteria in the discharge is 576 organisms/100 ml. The lowest ratio of *E. coli* to fecal coliform density found in a 2003 USGS study of rivers in Kansas (Water-Resources Investigations Report 03–4056) was 0.48. This ratio was used in the previous permit. Another study looking at geomean ratios in WWTFs across the US had a lowest ratio of 0.23 (WI DNR, 2002). The lowest ratio will yield the highest density of fecal coliform from a sample with a known *E. coli* density. Based on these assumptions, the discharge does not have a reasonable potential to cause a violation of the Washington water quality standards at the Washington state line. A single sample limit of 576 # *E.coli*/100mL would result in a 156 # fecal coliform organisms/100mL at the state border which is protective of a 200 # fecal coliform organisms/100mL single sample limit in Washington. A geomean limit of 126 # E.coli/100mL would result in 34 # fecal coliform organisms/100mL at the state border which is protective of a geomean of 100 # fecal coliform organisms /100mL limit in Washington. See Appendix B for calculations.

3.3.3.3 Chlorine

The water quality standards for Idaho and Washington contain identical water quality criteria to protect aquatic life against short term and long term adverse impacts from chlorine. The Idaho WQS in Table 1 at IDAPA 58.01.02.210 establish an acute criterion of 19 µg/L and a chronic criterion of 11 µg/L for the protection of aquatic life. A RPA showed that the discharge from the

facility could cause or contribute to a water quality exceedance with a 25% mixing zone. See Appendix B for the reasonable potential and effluent limit calculations for chlorine.

The chlorine limits are still not quantifiable using EPA-approved analytical methods. The minimum level (ML) for chlorine is 50 µg/L for this parameter and DEQ will use 50 µg/L as the compliance evaluation level for this parameter.

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. The Washington water quality standards require surface waters which are protected for salmon and trout spawning, noncore rearing and migration to have a pH within the range of 6.5 to 8.5. Based on a calculation of pH between two flows (see Appendix B), there is no reasonable potential to cause or contribute to a pH Washington water quality exceedance. Therefore, the permit incorporates the lower limit of the Washington and Idaho water quality standards (6.5 standard units), and the upper limit of the technology based effluent limits (9.0 standard units).

3.3.3.5 Total Phosphorus

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

3.3.3.6 Dissolved Oxygen

The Idaho WQS require the level of DO to exceed 6 mg/L at all times for water bodies that are protected for aquatic life use (IDAPA 58.01.02.250.02.f(a)). The Washington water quality standards require surface waters which are protected for salmon and trout spawning, noncore rearing and migration to have a one-day minimum dissolved oxygen concentration of 8.0 mg/L or greater.

Fourmile Creek is not water quality limited for DO and it is not expected that the discharge from the Viola Water and Sewer District will cause a violation of DO criteria in either State, so the permit does not contain a water-quality based limit for DO. The permit does contain a technology-based limit for BOD_5.

3.4 Narrative Criteria

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

The Idaho WQS require that surface waters of the State be free from floating, suspended, or submerged matter of any kind in concentrations impairing designated beneficial uses. The permit

contains a narrative limitation prohibiting the discharge of such materials or any violation of narrative WQC.

3.5 Antidegradation

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

- Tier I of antidegradation protection is designed to ensure that existing uses and the water quality necessary to protect those uses is maintained and protected (IDAPA 58.01.02.051.01; 58.01.02.052.01). A Tier I review is performed for all new or reissued permits or licenses (IDAPA 58.01.02.052.07).
- Tier II protection applies to any water bodies considered to be high quality waters (where the water quality exceeds levels necessary to support propagation of fish, shellfish, wildlife, and recreation in and on the water) and provides that water quality will be maintained and protected unless allowing for lower water quality is deemed by the state as necessary to accommodate important economic or social development in the area. In allowing any lowering of water quality DEQ must ensure adequate water quality to protect existing uses fully and must assure that there will be achieved the highest statutory and regulatory requirements for all new and existing point sources (IDAPA 58.01.02.051.02; 58.01.02.052.08).
- Tier III protection applies to water bodies that have been designated by the Idaho Legislature as outstanding national resource waters and provides that water quality is to be maintained and protected (IDAPA 58.01.02.051.03; 58.01.02.052.09).

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

According to DEQ's 2016 Integrated Report, the aquatic life use in this receiving water body AU is unassessed. For unassessed uses DEQ must provide an appropriate level of protection on a case-by-case basis using information available at the time of permit issuance (IDAPA 58.01.02.052.05.b). The limited available data from receiving water compliance monitoring indicates the stream is capable of supporting aquatic life when flowing in the spring (section 2.2). The contact recreation beneficial use is fully supported. As such, DEQ will grant Tier II protection (IDAPA 58.01.02.051.02) in addition to Tier I (IDAPA 58.01.02.052.05.c) for both uses.

3.5.1 Protection and Maintenance of Existing Uses (Tier I Protection)

A Tier I review is performed for all new or reissued permits or licenses, applies to all waters subject to the jurisdiction of the Clean Water Act, and requires demonstration that existing and designated uses and the level of water quality necessary to protect existing and designated uses

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

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

Prior to the development of the TMDL, the WQS require the application of the antidegradation policy and implementation provisions to maintain and protect uses (IDAPA 58.01.02.055.04). The 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. Therefore, DEQ has determined the permit will protect and maintain existing and designated beneficial uses in the Fourmile Creek in compliance with the Tier I provisions of Idaho's WQS (IDAPA 58.01.02.051.01 and 58.01.02.052.07).

3.5.2 High-Quality Waters (Tier II Protection)

Fourmile Creek is considered high quality for cold water aquatic life and secondary contact recreation. As such, the water quality relevant to cold water aquatic life and secondary contact recreation of Fourmile Creek 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 of concern that is relevant to cold water aquatic life and secondary contact recreation uses of Fourmile Creek (IDAPA 58.01.02.052.06); these include BOD_5, TSS, pH, *E. coli*, TRC, and ammonia**.** Effluent limits are set in the 2020 and 2004 permit for all these pollutants except phosphorus (a narrative limit) and temperature.

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 2004 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 2004 and 2020 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 2004 permit or license (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 Viola WWTF permit, this means determining the permit's effect on

water quality based upon the limits for pollutants with limits in both 2004 permit and the 2020 permit. Table 14 provides a summary of the 2004 permit limits and the 2020 permit limits.

Table 14. Antidegradation comparison for protection of the cold water aquatic life and secondary recreation beneficial use.

Pollutant	Units	2004 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 2004 and 2020 permit								
BOD_5	mg/L	30	45	—	30	45	—	No
	lb/day	16	24	—	16	24	—	
	% removal	85	—	—	85	—	—	
TSS	mg/L	30	45	—	30	45	—	No
	lb/day	16	24	—	16	24	—	
	% removal	85	—	—	85	—	—	
pH	std units	6.5–9.0 all times			6.5–9.0 all times			No
E. coli	no./100 mL	126	—	576	126	—	—	Yes - I[b]
TRC	mg/L	0.052	—	0.10	0.041	—	0.094	No
	lb/day	0.027	—	0.053	0.021	—	0.047	
Pollutants with new limits in the 2020 permit								
Ammonia, Total as N	mg/L	Monitor	—	Monitor	2.2	—	8.6	No
	lb/day	Monitor	—	Monitor	1.1	—	4.3	
Pollutants with no limits in the 2020 permit								
Temperature	°C	—	—	—	Monitor	—	Monitor	No
Phosphorus, Total as P	mg/L	—	—	—	Monitor	—	Monitor	No

a. No = No degradation, Yes - S = Increase in pollutant load or concentration resulting in significant degradation, Yes – I = Increase in pollutant load or concentration resulting in insignificant degradation
b. See Section 3.5.2.4, below.

3.5.2.2 New Permit Limits for Pollutants Currently Discharged

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

The proposed permit for the City of Viola includes new limits for total ammonia as N. The new limits were calculated using effluent and receiving water data from the previous permit.

3.5.2.3 Pollutants with No Limits

There are two POCs relevant to Tier II protection of aquatic life and contact recreation that currently are not limited and for which the proposed permit contains no limit (Table 14). For such pollutants, a change in water quality is determined by reviewing whether changes in production, treatment, or operation that will increase the discharge of these pollutants are likely (IDAPA 58.01.02.052.06.a.ii). The POCs are total phosphorus as P and temperature. DEQ has

concluded that the proposed monitoring should not cause a lowering of water quality for the pollutants with no limits. In addition, DEQ is requiring monitoring for these pollutants in the POTW effluent. As such, the proposed permit should maintain the existing high water quality in the Fourmile Creek. In sum, DEQ concludes that this discharge permit complies with the Tier II provisions of Idaho's WQS (IDAPA 58.01.02.051.02 and IDAPA 58.01.02.052.06).

3.5.2.4 E. coli

The reissued permit does not include the max daily limit of 576/100mL for *E.coli* that was included in the previous permit. The Idaho WQS state that a water sample exceeding the single sample maximum values indicates a likely exceedance of the geometric mean criterion, although it is not a violation of WQS by itself. For waters designated for secondary contact recreation, the "single sample maximum" value is 576/100 mL (IDAPA 58.01.02.251.01.b.ii.). Removing the max daily limit does not affect the assimilative capacity of the river because the Idaho WQC for *E. coli* is a monthly geomean of 126/100mL which is retained in this permit as the limit. Because the WQC for this particular parameter is a geometric mean and not an instantaneous concentration level, the maximum daily limit is only an indicator of the potential WQC and not a direct limit. DEQ concludes that removal of the instantaneous limit complies with the Tier II provisions of Idaho's WQS.

3.6 Antibacksliding

Section 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 2004 permit with the 2020 permit in Table 14 above. Apart from *E. coli*, here are no limits that became less stringent, thus no backsliding is occurring.

3.6.1 *E. coli* Antibacksliding

The 2004 permit contains a maximum daily limit (i.e. single sample limit) of 576/100 mL. This limit has been removed in the permit as per antibacksliding exception in 303(d)(4)(B) of the Clean Water Act. This limit removal is allowed under antibacksliding exceptions in IDAPA 58.01.25.200.03.c since

- The use is attained (i.e. the receiving water is not impaired for *E. coli*); and
- The existing discharge proposes no change in the discharge and is therefore considered a non-degrading discharge. The resulting water quality effects comport with the state's anti-degradation policy (see Table 14).

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 15. 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 15. Influent monitoring requirements

Item or Parameter	Monitoring Period	Units	Monthly Average	Sample Frequency	Sample Type	Reporting Period (DMR Months)
Flow	02/15 to 04/30, 07/01 to 09/30[a]	mgd	Report	1/week	Recorded	Monthly (February, March, April, July[a], August[a], September[a])
BOD_5	02/15 to 04/30, 07/01 to 09/30[a]	mg/L	Report	1/week	Grab	Monthly (February, March, April, July[a], August[a], September[a])
TSS	02/15 to 04/30, 07/01 to 09/30[a]	mg/L	Report	1/week	Grab	Monthly (February, March, April, July[a], August[a], September[a])

a. Influent monitoring for July, August, and September is only required during 2021 and 2022. For July, August, and September DMR reports during other years report the appropriate no data indicator (NODI) (Conditional Monitoring – Not Required This Period).

4.1.1 Influent Monitoring Changes from the 2020 Permit

Monitoring frequencies for influent parameters have been changed relative to the 2020 permit. Changes in monitoring are presented in Table 16, below.

Table 16. Changes in influent monitoring frequency from 2020 permit.

Parameter	2004 Permit	2020 Permit	Rationale
Flow	NA	1/week	Not previously monitored/reported
BOD_5	1/month	1/week	Reflects effluent monitoring frequency, necessary for calculating percent removal
TSS	1/month	1/week	Reflects effluent monitoring frequency, necessary for calculating percent removal

Summer influent monitoring has been added for the months of July, August, and September to evaluate the potential for POTW inflow and infiltration (I/I). Monitoring during these drier months is only required during 2021 and 2022 permit years.

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

Table 17. Additional Effluent Monitoring

Parameter	Monitoring Period	Units	Sample Frequency	Sample Type	Report	Reporting Period (DMR Months)
Flow	02/15 to 04/30	mgd	1/week	Measure	Monthly Average, Daily Maximum	Monthly (February, April, May)
Temperature	02/15 to 04/30	°C	1/week	Grab	Monthly Average, Daily Maximum	Monthly (February, April, May)
Phosphorus, Total as P	02/15 to 04/30	mg/L	1/week	Grab	Monthly Average, Daily Maximum	Monthly (February, April, May)
E. coli	02/15 to 04/30	#/100mL	5/month	Grab	Instantaneous Maximum	Monthly (February, April, May)

4.2.1 Effluent Monitoring Changes from the 2004 Permit

Monitoring frequency for ammonia and temperature have been changed relative to the 2004 permit. Changes in monitoring are presented in Table 18, below.

Table 18. Changes in effluent monitoring frequency from 2020 permit.

Parameter	2004 Permit	2020 Permit	Rationale
Ammonia, Total as N	1/month	1/week	Ammonia demonstrated reasonable potential to cause or contribute to a water quality exceedance and should be monitored more frequently
Temperature	NA	1/week	Effluent temperature is necessary to model pH mixing at the ID/WA border
Phosphorus, Total as P	NA	1/week	Phosphorus is a pollutant of concern and was not previously monitored.

4.3 Receiving Water Monitoring

Table 19 presents the receiving water monitoring requirements for the permit. The Viola WWTF should continue receiving water monitoring at the established location. Receiving water monitoring results must be submitted with the DMR.

Table 19. Receiving water monitoring requirements.

Parameter[a]	Monitoring Period	Units	Sample Frequency	Sample Type	Report	Reporting Period (DMR Months)
Flow	02/15 to 04/30	mgd	1/week	Measure	Monthly Average, Instantaneous Minimum	Monthly (February, March, April)
Temperature[c]	02/15 to 04/30	°C	1/week	Grab[b]	Monthly Average, Daily Maximum	Monthly (February, March, April)
pH[c]	02/15 to 04/30	std units	1/week	Grab[b]	Instantaneous Maximum, Instantaneous Minimum	Monthly (February, March, April)
Ammonia, Total as N	02/15 to 04/30	mg/L	1/week	Grab[b]	Monthly Average, Daily Maximum	Monthly (February, March, April)

a. All receiving water parameters must be sampled weekly between 2/15 and 4/30 of each year, even if the Viola WWTF is not discharging.
b. A grab sample is an individual sample collected over a 15-minute period or less.
c. Temperature and pH must be taken concurrently with total ammonia (as N) sampling

4.3.1 Receiving Water Monitoring Changes from the 2004 Permit

Monitoring frequency for all parameters have been changed relative to the 2004 permit. Changes in monitoring are presented in Table 20, below.

Table 20. Changes in receiving water monitoring frequency from 2004 permit.

Parameter	2004 Permit	2020 Permit	Rationale
Flow	1/month	1/week	There is no active flow gage on Fourmile Creek
Temperature	1/month	1/week	RPA showed potential to cause or contribute to a water quality exceedance for ammonia. RPA was conducted with limited data available. More data are needed to conduct more thorough analysis.
pH	1/month	1/week	
Ammonia, Total as N	1/month	1/week	

4.4 Permit Renewal Monitoring

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

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

Table 21. 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	°C	Grab	
BOD_5	mg/L	Grab	Maximum daily value, average daily value, analytical method and ML or MDL
TSS	mg/L	Grab	
E. coli	#/100 mL	Grab	

An individual sample includes all parameters in Table 21. For parameters in which a grab sample must be collected, each sample consists of a minimum of four grab samples, analyzed individually.

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

- 2021: February
- 2022: March
- 2023: April

In addition, the permittee must continue permit renewal effluent monitoring at a frequency of every other year after the last sample event listed in the schedule above until a new permit is issued.

This schedule spreads monitoring over the life the permit, as well as captures the range of the discharge season.

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 a compliance schedule for total ammonia. Ammonia has a new water quality based limits derived from WQBELs. The facility does not have sufficient data to verify if limits can be met. During the first three years of this permit, the facility will gather data and evaluate if permit compliance is already achievable. If permit compliance is not immediately achievable, the compliance schedule outlines actions to take to meet permit limits by 2029.

5.2 Nondomestic Waste Management

The permittee has nonsignificant, nondomestic (industrial/commercial) users, which are neither subject to the pretreatment standards in 40 CFR 405 through 471, nor meet any of the criteria of

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

5.3 Plans

5.3.1 Spill Control Plan

The permittee shall develop and implement a plan for possible spills of all treatment chemicals.

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 quality assurance. 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 Viola Water and Sewer District 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 management and disposal activities at each facility continue to be subject to the national sewage sludge standards at 40 CFR 503 and the requirements of Idaho's Wastewater Rules (IDAPA 58.01.16.480 and 650). The 503 regulations are self-implementing, and facilities must comply with them whether or not a permit has been issued. Idaho's Wastewater Rules require a POTW to have the capability to process sludge accumulated on site in preparation for final disposal or reuse (IDAPA 58.01.16.450 and 58.01.16.650). Operations of these sludge processing, storage, and disposal activities must comply with the facility's sludge management plan.

There is no record of sludge removal and disposal activities taking place at the facility.

8 Permit Expiration or Modification

The permit will expire five years after the effective date.

DEQ may modify a permit before its expiration date only for causes specified in IDAPA58.01.25.201. A modification other than a minor modification requires preparing a 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 . 2016. *Idaho's 2016 Integrated Report*. Boise, ID: DEQ. *https://www.deq.idaho.gov/media/60182296/idaho-integrated-report-2016.pdf*

DEQ. 2016. *Public Participation in the Permitting Process* – 2015FAG16[v1] Retrieved from *http://www.deq.idaho.gov/media/60178029/ipdes-public-participation-permitting-process-0216.pdf*

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

EPA. 2017. *National Pollutant Discharge Elimination System (NPDES) Inspection Report – Viola Water & Sewer District, Viola, ID*. Office of Compliance and Enforcement, Inspection and Enforcement Management Unit. EPA Region 10. March 2017.

Hirsch. 1982. *A Comparison of Four Streamflow Record Extension Techniques. Water Resources Research*, Vol. 18, No. 4, pages 1081-1088. August 1982.

Rasmussen, P.P., Ziegler, A.C., 2003, Comparison and Continuous Estimates of Fecal Coliform and Escherichia Coli Bacteria in Selected Kansas Streams, May 1999 Through April 2002: U.S. Geological Survey Water-Resources Investigations Report 03-4056, 87 p. *http://ks.water.usgs.gov/Kansas/pubs/reports/wrir.03-4150.html*

Appendix A. Facility Maps/Process Schematics

Map of Facility Location:
Source: *http://www.topozone.com*

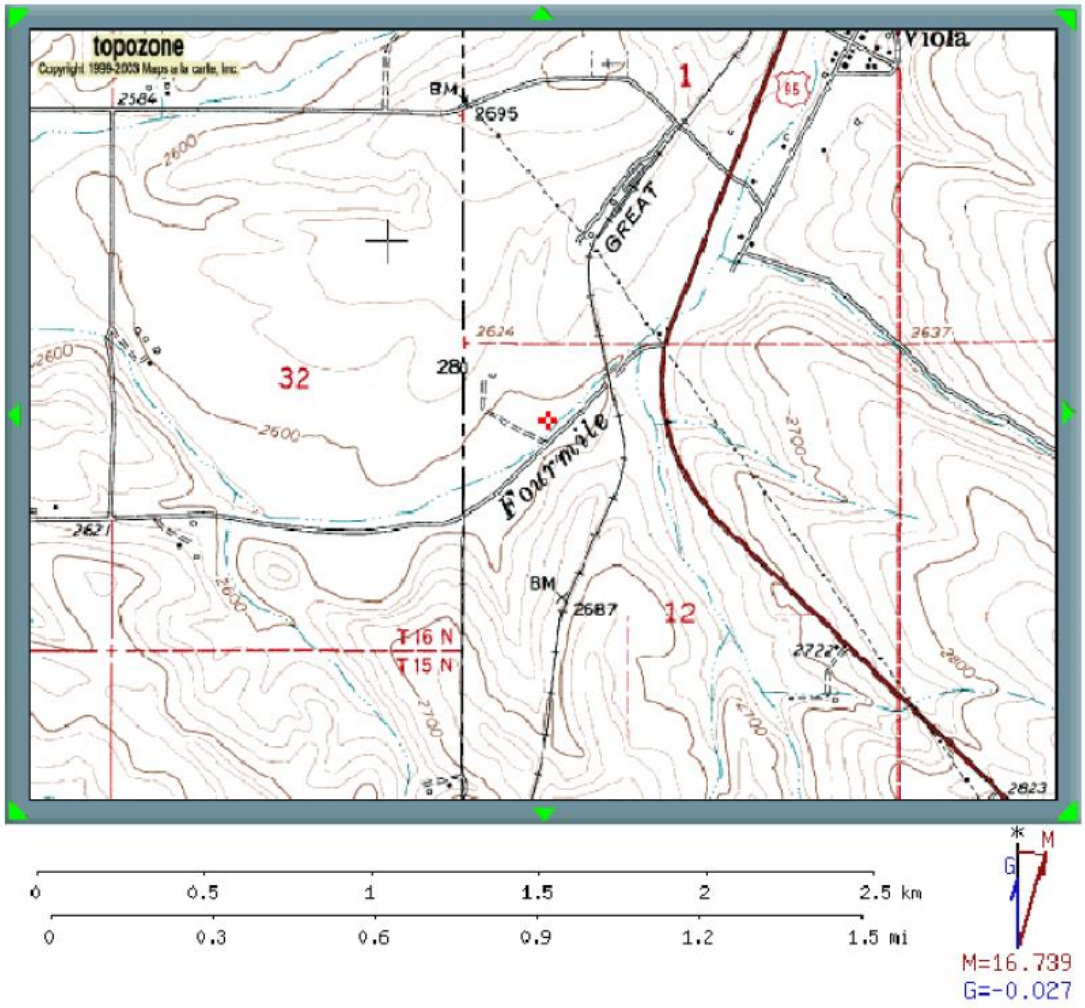

Figure 1: Topographic map of Viola Water and Sewer District area

Figure 2: Aerial photo of the Viola Water and Sewer District WWTF

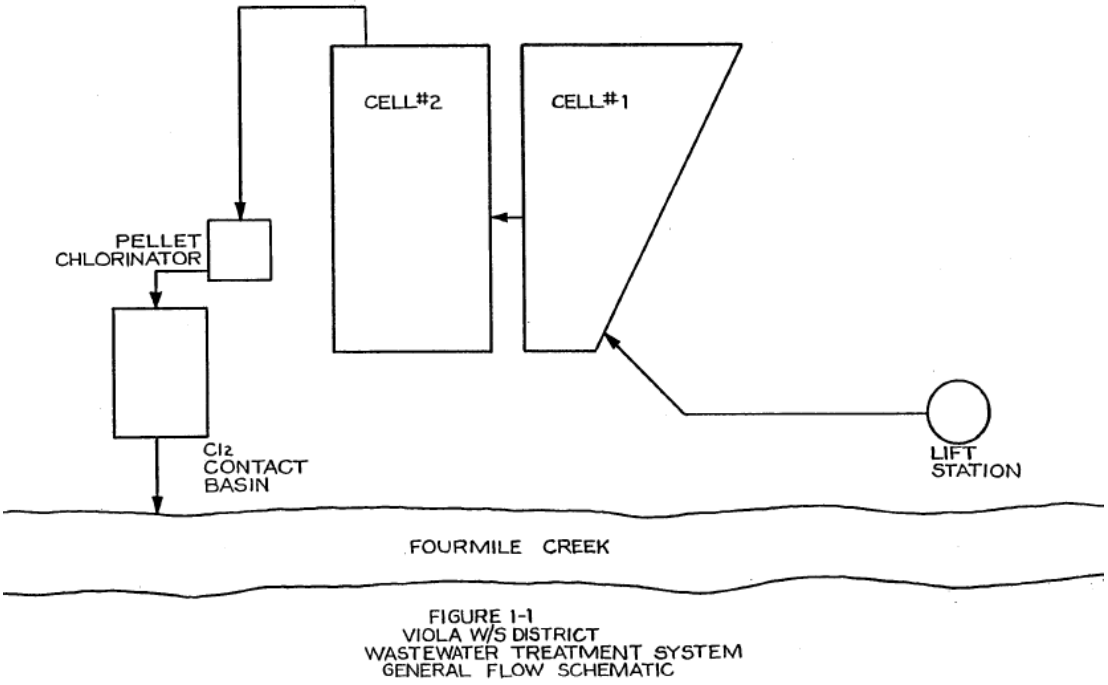

Figure 3: Flow schematic of the Viola Water and Sewer District WWTF when discharging

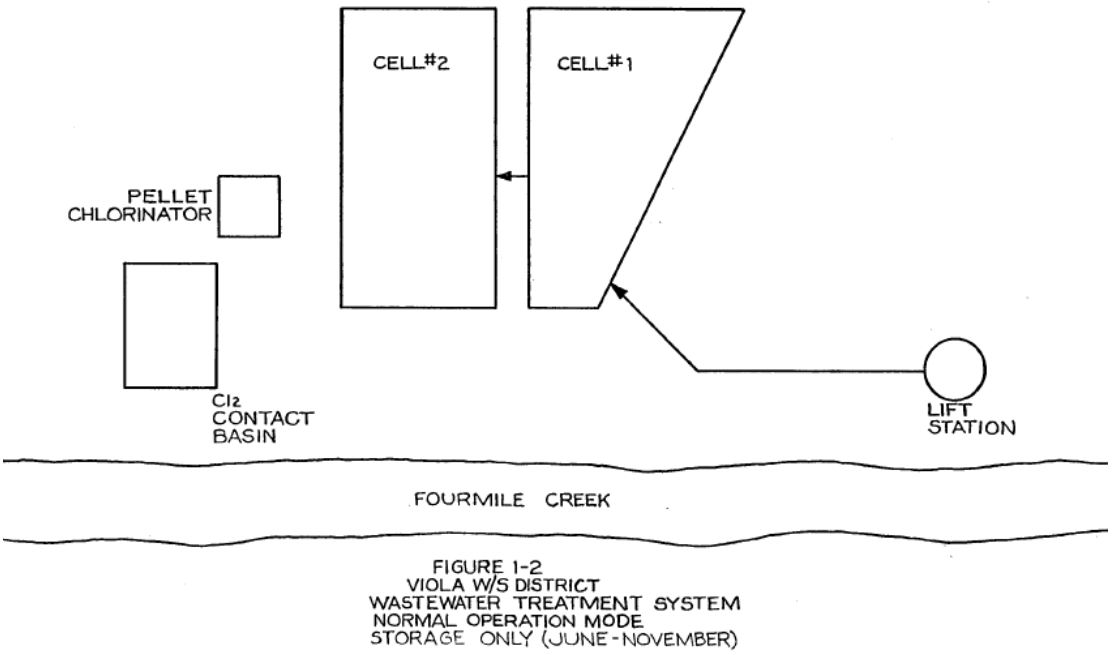

Figure 4: Flow schematic of the Viola Water and Sewer District WWTF when storing wastewater (June through January)

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, load, and removal rate limits for BOD_5 and TSS are the technology-based effluent limits of 40 CFR 133.102. As explained in section 3.3.3, DEQ has determined that more-stringent water quality-based effluent limits (WQBELs) are necessary for pH.

All other parameter limits for *E. coli*, TRC, and ammonia are based on WQBELs in order to ensure compliance with water quality standards. RPA was conducted for ammonia and TRC and reasonable potential existed to prompt limit development. Equations used in this determination are given below.

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.

B. WQBEL Calculations

The following calculations demonstrate how the WQBELs in the permit were calculated. The permit includes WQBELs for pH, *E. coli*, ammonia, and TRC. RPA was conducted for ammonia and TRC and reasonable potential existed, prompting limit development. The following discussion presents the general equations used to calculate the WQBELs.

Calculate the Wasteload Allocations (WLAs)

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

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

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

Where:

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

Idaho's WQC for some metals are expressed as the dissolved fraction. 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 22 details the calculations for WQBELs.

Table 22. Viola Water & Sewer District RPA

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

Facility Name	Viola
Facility Flow (mgd)	0.063
Facility Flow (cfs)	0.10

Critical River Flows	(IDAPA 58.01.02 03. b)	Annual Crit. Flows	Units
Aquatic Life - Acute Criteria - Criterion Max. Concentration (CMC)	1Q10	1.47	cfs
Aquatic Life - Chronic Criteria - Criterion Continuous Concentration (CCC)	7Q10 or 4B3	2.90	cfs
Ammonia	30B3/30Q10 (seasonal)		cfs
Human Health - Non-Carcinogen	30Q5	9.32	cfs
Human Health - carcinogen	Harmonic Mean Flow	12.48	cfs

Receiving Water Data		Notes:	Annual	
Hardness, as mg/L $CaCO_3$	Hardness, as mg/L $CaCO_3$	5th prctile at critical flow		mi
Temperature, °C	Temperature, °C	MAX 2017-2018 Data	9.8	
pH, S.U.	pH, S.U.	MAX 2017-2018 Data	8.3	

Pollutants of Concern			AMMONIA, default: cold water, fish early life stages	CHLORINE (Total Residual)
Effluent Data	Number of Samples in Data Set (n)		18	16
	Coefficient of Variation (CV) = Std. Dev./Mean (default CV = 0.6)		0.8047	0.70
	Effluent Concentration, µg/L (Max. or 95th Percentile) - (C_e)		6,010	60
	Calculated 50th prctile Effluent Conc. (when n>10), Human Health Only			
Receiving Water Statistics	90th Percentile Conc., µg/L - (C_u)		50	0
	Geometric Mean, µg/L, Human Health Criteria Only			
Applicable Water Quality Criteria	Aquatic Life Criteria, µg/L	Acute	3,149.089	19.
	Aquatic Life Criteria, µg/L	Chronic	1,523.966	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
Percent River Flow	Aquatic Life - Acute	1Q10	25%	25.00%
	Aquatic Life - Chronic	7Q10 or 4B3		25.00%
		30B3 or 30Q10		--
	Human Health - Non-Carcinogen and Chronic Ammonia	30Q5	12%	--
	Human Health - Carcinogen	Harmonic Mean		--
Calculated Dilution Factors (DF) (or enter Modeled DFs)	Aquatic Life - Acute	1Q10	4.77	4.77
	Aquatic Life - Chronic	7Q10 or 4B3		8.44
		30B3 or 30Q10		--
	Human Health - Non-Carcinogen and Chronic Ammonia	30Q5	12.48	--
	Human Health - Carcinogen	Harmonic Mean		--

Aquatic Life Effluent Limit Calculations

Number of Compliance Samples Expected per month (n)			30	4
n used to calculate AML (if chronic is limiting then use min=4 or for ammonia min=30)			30	4
LTA Coeff. Var. (CV), decimal	(Use CV of data set or default = 0.6)		0.805	0.700
Permit Limit Coeff. Var. (CV), decimal	(Use CV from data set or default = 0.6)		0.805	0.700
Acute WLA, ug/L	C_a = (Acute Criteria x MZ_a) - C_u x (MZ_a-1)	Acute	14,835	90.6
Chronic WLA, ug/L	C_d = (Chronic Criteria x MZ_c) - $C_{u\,x}$ (MZ_c-1)	Chronic	18,438	92.8
Long Term Ave (LTA), ug/L	WLAc x exp(0.5σ^2-zσ), Acute	99%	3,680	25.5
(99th % occurrence prob.)	WLAa x exp(0.5σ^2-zσ); ammonia n=30, Chronic	99%	13,265	44.6
Limiting LTA, ug/L	used as basis for limits calculation		3,680	25.5
Applicable Metals Criteria Translator (metals limits as total recoverable)				--
Average Monthly Limit (AML), ug/L	, where % occurrence prob =	95%	**4,630**	**42**
Maximum Daily Limit (MDL), ug/L	, where % occurrence prob =	99%	**14,835**	**91**
Average Monthly Limit (AML), mg/L			**4.6**	**0.042**
Maximum Daily Limit (MDL), mg/L			**14.8**	**0.091**
Average Monthly Limit (AML), lb/day			**2.43**	**0.022**
Maximum Daily Limit (MDL), lb/day			**7.79**	**0.048**

Human Health Reasonable Potential Analysis

σ	σ^2=ln(CV^2+1)			0.631
P_n	=(1-confidence level)$^{1/n}$ where confidence level =	95%		0.829
Multiplier	=exp(2.326σ-0.5σ^2)/exp[invnorm(P_N]σ-0.5σ^2], prob. =	50%		0.548
Dilution Factor (for Human Health Criteria)		.		--
Max Conc. at edge of Chronic Zone, ug/L (C_d)				--
Reasonable Potential to exceed HH Water & Organism				**NO**
Reasonable Potential to exceed HH Organism Only				**NO**

C. RPA for Fecal Coliform at the ID/WA boundary.

The following assumptions were made for this analysis:

- the discharge from the Viola WWTF (0.063 MGD) will be completely mixed with the receiving stream (1Q10 is 0.950226 MGD) at the Washington state line
- there will be no decay of bacteria between the discharge and the state line,
- the upstream density of fecal coliform bacteria in Fourmile Creek is 0 #/100mL
- the highest concentration of *E. coli* bacteria in the discharge is 576 organisms/100 ml
- The lowest geomean ratio of *E. coli* to fecal coliform density is 0.23

$$\frac{576\ \#\ E.coli}{100mL} \times \frac{100\ \#\ Fecal\ coliform\ (FC)}{23\ E.coli} = \frac{2504\ \#FC}{100mL}$$

$$\frac{2504\ \#FC}{100mL} \times \frac{100mL}{0.0264\ gal} = \frac{94{,}848\ \#FC}{1\ gal}$$

Assuming the effluent completely mixes with the receiving water the available gallons for mixing are: 1,013,226 gallons (effluent + receiving water).

$$\frac{94{,}848\ \#FC}{1\ gal} \times \frac{63{,}000\ gal}{1\ day} \times \frac{1\ day}{1{,}013{,}226\ gallons} = 5{,}897\ \#FC/gal$$

$$\frac{5{,}897\ FC}{1\ gal} \times \frac{1\ gal}{3785\ mL} \times 100mL = \frac{156\#FC}{100mL}$$

A single sample limit of 576 # E.coli/100mL is protective of the 200 FC/100mL single sample limit in Washington. There is no reasonable potential to cause or contribute to a WQ exceedance.

$$\frac{126\ \#\ E.coli}{100mL} \times \frac{100\ \#\ Fecal\ coliform\ (FC)}{23\ E.coli} = \frac{548\ \#FC}{100mL}$$

$$\frac{548\ \#FC}{100mL} \times \frac{100mL}{0.0264\ gal} = \frac{20{,}758\ \#FC}{1\ gal}$$

Assuming the effluent completely mixes with the receiving water the available gallons for mixing are: 1,013,226 gallons (effluent + receiving water).

$$\frac{20{,}758\ \#FC}{1\ gal} \times \frac{63{,}000\ gal}{1\ day} \times \frac{1\ day}{1{,}013{,}226\ gallons} = 1{,}291\ \#FC/gal$$

$$\frac{1{,}291\ FC}{1\ gal} \times \frac{1\ gal}{3785\ mL} \times 100mL = \frac{34\#FC}{100mL}$$

A geomean limit of 126 # E.coli/100mL is protective of a geomean of 100 FC/100mL limit in Washington. There is no reasonable potential to cause or contribute to a WQ exceedance.

D. RPA for pH at the ID/WA boundary.

Calculation of pH of a Mixture of Two Flows

Based on the procedure in EPA's DESCON program (EPA, 1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington D.C.)

	Yr. Around Basis		
INPUT	**Min Limit**	**Max Limit**	**Comments**
1. Dilution Factor at Mixing Zone Boundary	4.8	4.8	Chronic Dilution Factor at Design Flow and Low River Flow Conditions
2. Ambient/Upstream/Background Conditions			
Temperature (deg C):	7.30	9.80	Max. and min. temperature for lower and upper pH, respectively, based on USGS data
pH:	8.00	8.30	Min. and max. pH for lower and upper pH, respectively, based on USGS data.
Alkalinity (mg $CaCO_3$/L):	25.00	25.00	USGS Data or estimate. 25 mg/L conservative estimate.
3. Effluent Characteristics			
Temperature (deg C):	9.80	11.80	Max and min for lower and upper temperature, DMR data
pH:	**6.80**	**9.30**	Lower and Upper Effluent Limits, Sec. Treatment Standards 6.0 to 9.0 or established based on WQS.
Alkalinity (mg CaCO3/L):	25.00	25.00	Refer to effluent data or WET data sheets.
4. Applicable Water Quality Standards	**6.50**	**8.50**	WASHINGTON STANDARDS
OUTPUT			
1. Ionization Constants			
Upstream/Background pKa:	6.49	6.47	
Effluent pKa:	6.47	6.45	
2. Ionization Fractions			
Upstream/Background Ionization Fraction:	0.97	0.99	
Effluent Ionization Fraction:	0.68	1.00	
3. Total Inorganic Carbon			
Upstream/Background Total Inorganic Carbon (mg CaCO3/L):	26	25	
Effluent Total Inorganic Carbon (mg CaCO3/L):	37	25	
4. Conditions at Mixing Zone Boundary			
Temperature (deg C):	7.82	10.22	
Alkalinity (mg CaCO3/L):	25.00	25.00	
Total Inorganic Carbon (mg CaCO3/L):	28.04	25.30	
pKa:	6.49	6.46	
RESULTS			
pH at Mixing Zone Boundary:	**7.40**	**8.39**	
Reasonable Potential to contribute to excursion above WQS	**NO**	**NO**	

Appendix C. Your Right to Appeal

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

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

Appendix D. Public Involvement and Public Comments

A. Public Involvement Information

DEQ proposes to reissue a permit to the Viola Water and Sewer District. The permit includes wastewater discharge limits and other conditions. This fact sheet describes the facility and DEQ's reasons for requiring permit conditions.

DEQ will place a Public Notice of Draft on 01/10/2020 in the Moscow-Pullman Daily News to inform the public and to invite comment on the draft Idaho Pollutant Discharge Elimination System permit and fact sheet.

The notice:

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

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 North Hilton • Boise, ID 83706
• (208) 373-0502
www.idaho.deq.gov

Brad Little, Governor
John H. Tippets, Director

DEQ SEEKS COMMENT ON DRAFT IDAHO POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT FOR THE VIOLA WATER AND SEWER DISTRICT WASTEWATER TREATMENT FACIITY

PROPOSED ACTION: The Viola Water and Sewer District has applied to the Department of Environmental Quality (DEQ) for an Idaho Pollutant Discharge Elimination (IPDES) wastewater discharge permit for its municipal wastewater treatment facility located on Trestle Road, Viola, ID. DEQ is seeking public comment on the draft IPDES permit, associated fact sheet, and application for the Viola Water and Sewer District Wastewater Treatment Facility. This proposed permit authorizes the discharge of treated municipal wastewater in year-round to Fourmile Creek for five years. The permit identifies the pollutants of concern and lists the required limits for each pollutant or parameter, and monitoring and reporting requirements necessary to ensure compliance with the permit and protect human health and the environment.

PUBLIC COMMENT PERIOD: Notice is given that DEQ has scheduled a period to receive public comments on the draft permit and fact sheet through Monday, February 10th, 2020 at 5 p.m. MST. A public hearing may be held, if requested in writing by Friday, January 24th, 2020. The draft permit and fact sheet are available for public review at DEQ's state office in Boise, the Lewiston Regional Office, and on DEQ's website.
http://www.deq.idaho.gov/news-public-comments-events/

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

Lori Flook
Idaho Department of Environmental Quality
Surface & Wastewater Division
1410 N. Hilton
Boise, ID 83706
Email: Lori.Flook@deq.idaho.gov

Karen Jackson
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Surface & Wastewater Division
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B. Public Comments and Response to Comments

Idaho Pollutant Discharge Elimination System Discharge Permit No. ID0026310

Response to Comments on Draft Viola Water and Sewer District IPDES Permit

February 10, 2020 comment deadline

Viola Water and Sewer District Letter

1. The Viola Water and Sewer District would like to request a 10 year 'schedule of compliance' for the ammonia effluent limit based on the following:
   i. this is a new water quality based limit;
   ii. effluent concentrations of ammonia to determine facility compliance are needed;
   iii. if the ammonia concentration data indicate the facility is unable to comply with the new limits, the District will need to conduct facility planning and possible upgrades; and,
   iv. facility planning and upgrades take time to acquire the funds, time to conduct research and update the facility plan, and time to implement and verify capital investments for compliance purposes.

Response 1: DEQ agrees with the comment. An ammonia compliance schedule has been added to the permit. The ammonia limits are new in this permit, and it is unknown whether or not the facility can comply with the limits. The facility does not have sufficient data to determine if an interim limit is appropriate. During the first three years of this permit, the facility will gather data and evaluate if permit compliance is already achievable. If permit compliance is not immediately achievable, each compliance schedule outlines actions to take to meet permit limits by 2029.

Changes to draft permit: Section 3.1 of the permit and Section 5.1 of the fact sheet have been added.

Association of Idaho Cities Letter

2. The District's facility stores the treated effluent for much of the calendar year. Because of this, it is possible for Idaho to restrict the authorization to discharge for those periods where the critical flow conditions are greater than those proposed in the draft Permit and Fact Sheet. This approach would increase the mixing zone and allow for slightly higher effluent limits for the ammonia and TRC, while still protecting aquatic life. AIC and District suggests that a fully planned compliance strategy developed during the drafting of the Permit conditions is a preferred approach for Idaho's communities.

Response 2: A compliance schedule for ammonia has been included in the permit – See Response 1.

Changes to draft permit: See Response 1.

3. Under Section 4 Standard Conditions, item 4, the draft Permit requires "The permittee must notify DEQ of all significant QAPP modifications (i.e., modifications to sample collections, sample analysis, or other procedures)." This is more restrictive than what is currently required by EPA and is not needed. QAPs are living documents that reflect the real-time practices of the laboratory operations and sampling. This document should be kept up to date. However, requiring the permittee to notify DEQ of significant change in the QAP is excessive and does not serve the intended purpose. Keeping a record of significant updates to the QAP and the requirement to have an up to date QAP available for DEQ inspection at any time is reasonable. The District requests that the final Permit utilize the following language (from current Region 10 EPA permits) that meets the intent of keeping the QAP up to date: "The permittee must amend the QAP whenever there is a modification in sample collection, sample analysis, or other procedure addressed by the QAP. Copies of the QAP must be kept on site and made available to EPA and/or IDEQ upon request." Or utilize similar language that was utilized for the O&M Manual (at the bottom of page 29): Example: Any significant modifications to laboratory operations must be concurrently reflected within the QAP manual. The manual must be retained on site and made available to DEQ upon request.

Response 2: Recent NPDES permits from EPA (Kootenai-Ponderay, 2018; Kooskia, 2020; Jug Mountain, 2019) require similar QAP notification in submission schedules. EPA's submission language consists of:

> *"The permittee must provide EPA and the Idaho Department of Environmental Quality (IDEQ) with written notification that the Plan has been developed and implemented within 180 days after the effective date of the final permit (see Part II.B of this permit). The Plan must be kept on site and made available to EPA and IDEQ upon request."*

Changes to draft permit: None

Other changes

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

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