pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northeast Regional Office
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Application Type	**Renewal**	Application No.	**PA0062910**
Facility Type	**Municipal**	APS ID	**754660**
Major / Minor	**Minor**	Authorization ID	**1399428**

Applicant and Facility Information

Applicant Name	**Borough of Bowmanstown**	Facility Name	**Bowmanstown Wastewater Treatment Plant**
Applicant Address	490 Ore Street, PO Box 127 Bowmanstown, PA 18030	Facility Address	800 Lincoln Avenue Bowmanstown, PA 18071
Applicant Contact	Tracy L. Burbage, Secretary/ Assistant Treasurer	Facility Contact	Chris Bixler, Operator
Applicant Phone	(610) 852-2455	Facility Phone	(610) 852-2455
Client ID	116556	Site ID	445346
Ch 94 Load Status	Not Overloaded	Municipality	Bowmanstown Borough
Connection Status	No Limitations	County	Carbon
Date Application Received	June 3, 2022	EPA Waived?	Yes
Date Application Accepted	June 27, 2022	If No, Reason	-

Purpose of Application: Renewal of NPDES permit for discharge of treated sewage.

Summary of Review

The applicant is requesting the renewal of an NPDES permit to discharge up to 0.14 MGD of treated sewage into the Lehigh River, a Trout Stocking, Migratory Fish (TSF, MF) receiving stream in State Water Plan Basin 2-B (Middle Lehigh River). As per the Department's current existing use list, the receiving stream does not have an existing use classification that is more protective than its designated use. This stream segment is not designated as a naturally reproducing trout stream as per PA Fish & Boat Commission. This discharge is not expected to affect public water supplies.

Limitations for pH, $CBOD_5$, Total Suspended Solids (TSS), and Fecal Coliform are technology-based and carried over from the previous permit.

A BPJ-based limitation of 5.0 mg/L for Dissolved Oxygen (DO) has been added to the permit. The previous permit included a monitoring/reporting requirement for DO. eDMR data from August 2022 to July 2023 indicate the facility typically meets the 5.0 mg/L limitation; however, the DO did drop to 4.75 mg/L in May 2023. Therefore, the updated DO limitation will come into effect one year after the permit effective date to allow the facility time to make any necessary adjustments.

The 1.0 mg/L monthly average and 2.0 mg/L IMAX limitations for Total Residual Chlorine (TRC) in the previously issued permit were water quality-based limitations. As per PA Code 92a.47(a)(8) (which refers to PA Code 92a.48(b)(2)), a monthly average TRC facility-specific BAT effluent limit of 0.5 mg/L and an IMAX limit of 1.6 mg/L has been applied to this permit renewal. The TRC Calculation Spreadsheet did not recommend more stringent water quality-based limitations. eDMR data from August 2022 to July 2023 (seen on pages 5-8 of this Fact Sheet) indicates that the facility is consistently and significantly under 0.5 mg/L monthly average and 1.6 mg/L IMAX for TRC. In November 2022 the facility did exceed the existing permit limitation of 2.0 mg/L IMAX, but this appears to be an isolated occurrence. Therefore, the new TRC technology-based limit will be applied at the permit effective date.

Approve	Deny	Signatures	Date
X		/s/ Allison Seyfried / Project Manager	October 3, 2023
X		/s/ Amy M. Bellanca, P.E. / Program Manager	10-12-23

Summary of Review

The 1/week monitoring and reporting for Ammonia-Nitrogen has been carried over from the previous permit. WQM 7.0 modeling did not recommend stricter limits.

The DRBC requested quarterly monitoring/reporting for Total Dissolved Solids (TDS) and the 85% minimum BOD_5 Removal was carried over from the previous permit.

Per current Standard Operating Procedures for Publicly Owned Treatment Plants, the raw sewage influent monitoring/ reporting for TSS and BOD_5 has been maintained in the permit.

24-hour composite sampling is now required in place of 8-hour composite sampling.

Sewage discharges now require monitoring and reporting for E. Coli. A monitoring frequency of 1/month for design flows >= 1 MGD, 1/quarter for design flows >= 0.05 and < 1 MGD, 1/year for design flows of 0.002 – 0.05 MGD will be utilized.

Pollutant sampling results submitted with the permit application were entered into the Toxic Management Spreadsheet (TMS). The TMS did not recommend any additional limitations or reporting/monitoring.

A final Total Maximum Daily Load (TMDL) exists for the Lehigh River Watershed. The TMDL addresses metals (iron, manganese, and aluminum) and pH associated with acid mine drainage (AMD). There are no approved Waste Load Allocations (WLA) for this facility. Since this is a sewage discharge with no industrial contributors, no appreciable quantities of these metals are expected to be present in the effluent.

The semi-annual monitoring and reporting for Total Iron, Total Manganese, and Total Aluminum due to the Acid Mine Drainage TMDL has been carried over from the previous permit.

The facility discharges between two USGS Stream Gages (01449000 – Lehigh River at Lehighton, PA and 1451000 – Lehigh River at Walnutport, PA). The Walnutport gage appears to be closer. Data from this gage and associated Low Flow Yield (LFY) and $Q_{7\text{-}10}$ Flow calculations can be seen on page 11 of this Fact Sheet. USGS StreamStats was also used to generate a LFY and $Q_{7\text{-}10}$ Flow. Finally, the state-wide default Low Flow Yield (LFY) of 0.1 cfs/mi^2 was used to model the discharge. The USGS StreamStats and state-wide default flow calculations can be observed on pages 10-11 of this Fact Sheet. The previous permit utilized a LFY of 0.179 cfs/mi^2 based on the 1992 WPC Report. The table below shows a summary of all $Q_{7\text{-}10}$ and LFYs that were reviewed as part of this renewal.

$Q_{7\text{-}10}$ Basis	$Q_{7\text{-}10}$ Flow (cfs)	LFY (cfs/mi^2)
USGS Stream Gage 1451000	177.1	0.239
Previous Permit	132.7	0.179
USGS StreamStats	156	0.21
State-wide Default	74.1	0.1

The USGS StreamStats data was used as the main modeling parameter for this permit. The most conservative state-wide default was also entered into WQM 7.0 and the TRC Spreadsheet. Neither method recommended any limitations.

For the remaining modeling inputs, RMI values were obtained using the “PA Historic Streams” feature of eMapPA, drainage areas were delineated using USGS’s StreamStats Interactive Map, and elevations were obtained using the elevation profile feature of StreamStats.

Pollutant sampling results submitted with the permit application were entered into the Toxic Management Spreadsheet (TMS). The TMS did not recommend any additional limitations or reporting/monitoring.

For this permit renewal, all monitoring frequencies for parameters with limitations are consistent with the Department’s *Technical Guidance for the Development and Specification of Effluent Limitations and Other Permit Conditions in NPDES Permits* (document no. 362-0400-001).

The existing permit expired on September 30, 2022 and the application for renewal was not received until June 3, 2022.

A Water Management System Inspection query indicated multiple inspections have recently occurred. A routine/partial inspection was performed on April 19, 2023.

Summary of Review

There are currently six open violations for this client that may need to be resolved before issuance of the final permit:

1. 07/11/2019 - Violation ID 857914 – Violation Code 92A.44 – NPDES – Violation of effluent limits in Part A of permit (WPC NPDES - Program Specific ID: PA0062910).

2. 10/19/2021 - Violation ID 933544 – Violation Code 92A.44 – NPDES – Violation of effluent limits in Part A of permit (WPC NPDES - Program Specific ID: PA0062910).

3. 10/19/2021 - Violation ID 933545 – Violation Code 92A.47(C) – NPDES – Illegal discharge to waters of the Commonwealth from a sanitary sewer overflow (WPC NPDES - Program Specific ID: PA0062910).

4. 10/19/2021 - Violation ID 933546 – Violation Code 92A.41(A)10C – NPDES – Failure to collect representative samples (WPC NPDES - Program Specific ID: PA0062910).

5. 05/03/2023 - Violation ID 999484 – Violation Code 92A.44 – NPDES – Violation of effluent limits in Part A of permit (WPC NPDES - Program Specific ID: PA0062910).

6. 05/03/2023 - Violation ID 99486 – Violation Code 92A.41(A)12B – NPDES – Failure to submit monitoring report(s) or properly complete monitoring reports (WPC NPDES - Program Specific ID: PA0062910).

Sludge use and disposal description and location(s): Sewage sludge is disposed at on-site reed beds.

Public Participation

DEP will publish notice of the receipt of the NPDES permit application and a tentative decision to issue the individual NPDES permit in the *Pennsylvania Bulletin* in accordance with 25 Pa. Code § 92a.82. Upon publication in the *Pennsylvania Bulletin*, DEP will accept written comments from interested persons for a 30-day period (which may be extended for one additional 15-day period at DEP's discretion), which will be considered in making a final decision on the application. Any person may request or petition for a public hearing with respect to the application. A public hearing may be held if DEP determines that there is significant public interest in holding a hearing. If a hearing is held, notice of the hearing will be published in the *Pennsylvania Bulletin* at least 30 days prior to the hearing and in at least one newspaper of general circulation within the geographical area of the discharge.

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.14
Latitude	40º 48' 15.39"	Longitude	-75º 40' 16.76"
Quad Name	Lehighton	Quad Code	1240
Wastewater Description:	Sewage Effluent		
Receiving Waters	Lehigh River (TSF, MF)	Stream Code	3335
NHD Com ID	26289027	RMI	39.9
Drainage Area	741 mi^2	Yield (cfs/mi^2)	0.21
Q_{7-10} Flow (cfs)	156	Q_{7-10} Basis	USGS StreamStats
Elevation (ft)	415.77	Slope (ft/ft)	-
Watershed No.	2-B	Chapter 93 Class.	TSF, MF
Existing Use	-	Existing Use Qualifier	-
Exceptions to Use	-	Exceptions to Criteria	-
Assessment Status	Impaired		
Cause(s) of Impairment	METALS		
Source(s) of Impairment	ACID MINE DRAINAGE		
TMDL Status	Final	Name	Lehigh River TMDL
Nearest Downstream Public Water Supply Intake	Northampton Borough Municipal Authority		
PWS Waters	Lehigh River	Flow at Intake (cfs)	-
PWS RMI	24.8	Distance from Outfall (mi)	~ 15.1

Treatment Facility Summary

Treatment Facility Name: Bowmanstown Borough STP

WQM Permit No.	Issuance Date	Scope
1314403	5/1/2015	New grinder and spiral fine screen
1395401	9/23/1996	Construction/operation of treatment plant and collection system

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary	Sequencing Batch Reactor	Chlorination	0.054 (2019-2021)

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.14	238*	Not Overloaded	Reed Beds	-

***Per 1996 WQM Permit Application Design Engineer Report. Application had 250 lbs/day. The 5/1/2015 WQM had 250 lbs/day, but that might be based on inaccurate information. The 3/20/2014 WQM had indicated 238 lb/day.**

Compliance History

DMR Data for Outfall 001 (from August 1, 2022 to July 31, 2023)

Parameter	JUL-23	JUN-23	MAY-23	APR-23	MAR-23	FEB-23	JAN-23	DEC-22	NOV-22	OCT-22	SEP-22	AUG-22
Flow (MGD) Average Monthly	0.075	0.058	0.06	0.059	0.058	0.052	0.056	0.06	0.053	0.049	0.05	0.051
Flow (MGD) Daily Maximum	0.279	0.082	0.17	0.13	0.088	0.062	0.072	0.134	0.081	0.07	0.074	0.07
pH (S.U.) Minimum	7.09	7.04	7.23	7.07	6.95	7.06	7.13	7.08	7.16	7.00	6.89	7.14
pH (S.U.) Maximum	7.76	7.64	8.0	7.63	7.78	7.58	7.52	7.56	8.05	7.68	7.30	7.56
DO (mg/L) Minimum	5.6	6.19	4.75	7.03	8.1	8.15	7.67	6.26	6.65	5.88	5.58	6.01
TRC (mg/L) Average Monthly	< 0.05	0.04	< 0.03	0.03	0.03	0.04	< 0.2	< 0.1	0.1	< 0.1	0.04	0.1
TRC (mg/L) Instantaneous Maximum	0.11	0.07	0.07	0.06	0.09	0.10	1.11	0.34	2.13	0.79	0.08	0.11
CBOD5 (lbs/day) Average Monthly	< 7.8	< 1.2	< 9.3	< 0.9	< 1.7	1.2	1.2	< 5.3	< 0.9	< 0.9	< 1.0	< 1.0
CBOD5 (lbs/day) Weekly Average	< 13.2	1.6	15.9	1.0	2.6	1.8	1.6	21.7	< 1.0	1.0	1.4	1.1
CBOD5 (mg/L) Average Monthly	< 7.3	< 2.7	< 10.7	< 2.0	< 3.8	3.0	2.5	< 6.3	< 2.0	< 2.3	< 2.6	< 2.4
CBOD5 (mg/L) Weekly Average	< 11.5	3.9	17.0	2.1	5.9	4.6	2.9	19.9	< 2.0	2.5	3.3	2.8
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	129	138	152	109	155	179	121	159	118	119	93	70
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	129	138	152	109	155	179	121	159	118	119	93	70
BOD5 (mg/L) Raw Sewage Influent Average Monthly	253	291	290	277	357	371	295	313	248	265	259	172
BOD5 (mg/L) Raw Sewage Influent Daily Maximum	253	291	290	277	357	371	295	313	248	265	259	172

BOD5 % Removal (%) Minimum Monthly Average	99	99	99	99	98	99	99	99	99	99	99	98
TSS (lbs/day) Average Monthly	< 6.4	< 2.2	< 8.0	< 1.8	< 2.1	< 1.7	< 1.9	< 4.3	< 1.7	< 1.5	< 1.6	< 1.6
TSS (lbs/day) Raw Sewage Influent Average Monthly	95	101	95	69	110	121	84	108	78	84	63	21
TSS (lbs/day) Raw Sewage Influent Daily Maximum	95	101	95	69	110	121	84	108	78	84	63	21
TSS (lbs/day) Weekly Average	< 9.5	3.2	< 13.0	< 2.0	3.3	< 1.9	< 2.2	< 15.2	< 1.9	< 1.8	< 2.4	< 2.0
TSS (mg/L) Average Monthly	< 6.9	< 5.2	< 8.8	< 4.1	< 4.5	< 4.3	< 4.0	< 5.9	< 4.0	< 4.0	< 4.0	< 4.0
TSS (mg/L) Raw Sewage Influent Average Monthly	187	212	180	177	254	250	205	212	164	187	177	52
TSS (mg/L) Raw Sewage Influent Daily Maximum	187	212	180	177	254	250	205	212	164	187	177	52
TSS (mg/L) Weekly Average	< 9.2	7.0	< 12.6	4.4	6.5	5.0	< 4.0	< 14.5	< 4.0	< 4.0	< 4.0	< 4.0
Total Dissolved Solids (lbs/day) Average Quarterly		203			156			147			159	
Total Dissolved Solids (mg/L) Average Quarterly		426			382			419			390.0	
Fecal Coliform (No./100 ml) Geometric Mean	< 13	< 1.0	< 13	< 4	< 1.0	< 2	< 1	< 44	< 1.0	< 1.0	< 1.0	< 1
Fecal Coliform (No./100 ml) Instantaneous Maximum	> 20000	5.0	20000.0	205	4.0	3	1	> 20000	< 1.0	2.0	1.0	2
Nitrate-Nitrite (lbs/day) Annual Average								0.35				
Nitrate-Nitrite (mg/L) Annual Average								7.44				
Nitrate-Nitrite (mg/L) Daily Maximum								7.44				

Total Nitrogen (lbs/day) Annual Average								2.92				
Total Nitrogen (mg/L) Annual Average								8.35				
Ammonia (lbs/day) Average Monthly	< 2.0	< 0.04	< 2.0	< 0.04	< 0.1	< 0.06	< 0.06	< 1	< 0.04	< 0.04	< 0.05	< 0.04
Ammonia (mg/L) Average Monthly	< 1.98	< 0.1	< 1.7	< 0.1	< 0.25	< 0.15	< 0.12	< 1.52	< 0.1	< 0.1	< 0.13	< 0.11
Ammonia (mg/L) Daily Maximum	10.7	< 0.1	9.55	< 0.1	0.45	0.28	0.16	7.2	0.17	< 0.1	0.24	0.14
TKN (lbs/day) Annual Average								0.31				
TKN (mg/L) Annual Average								0.91				
TKN (mg/L) Daily Maximum								0.91				
Total Phosphorus (lbs/day) Annual Average								2.57				
Total Phosphorus (mg/L) Annual Average								7.36				
Total Phosphorus (mg/L) Daily Maximum								7.36				
Total Aluminum (lbs/day) Semi-Annual Average		< 0.04						< 0.03				
Total Aluminum (mg/L) Semi-Annual Average		< 0.100						< 0.100				
Total Aluminum (mg/L) Daily Maximum		< 0.100						< 0.100				
Total Iron (lbs/day) Semi-Annual Average		< 0.04						< 0.03				
Total Iron (mg/L) Semi-Annual Average		< 0.100						< 0.100				
Total Iron (mg/L) Daily Maximum		< 0.100						< 0.100				
Total Manganese (lbs/day) Semi-Annual Average		0.01						0.01				

Total Manganese (mg/L) Semi-Annual Average		0.042						0.015				
Total Manganese (mg/L) Daily Maximum		0.042						0.015				

Compliance History

Effluent Violations for Outfall 001, from: September 1, 2022 To: July 31, 2023

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
TRC	11/30/22	IMAX	2.13	mg/L	2.0	mg/L
Fecal Coliform	05/31/23	IMAX	20000.0	No./100 ml	1000	No./100 ml
Fecal Coliform	07/31/23	IMAX	> 20000	No./100 ml	1000	No./100 ml
Fecal Coliform	05/31/23	IMAX	20000.0	No./100 ml	1000	No./100 ml
Fecal Coliform	12/31/22	IMAX	> 20000	No./100 ml	10000	No./100 ml
Fecal Coliform	12/31/22	IMAX	> 20000	No./100 ml	10000	No./100 ml
Fecal Coliform	07/31/23	IMAX	> 20000	No./100 ml	1000	No./100 ml

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.14
Latitude 40º 48' 15.00" **Longitude** -75º 40' 15.00"
Wastewater Description: Sewage Effluent

Technology-Based Limitations

The following technology-based limitations apply, subject to water quality analysis and BPJ where applicable:

Pollutant	Limit (mg/l)	SBC	Federal Regulation	State Regulation
$CBOD_5$	25.0	Average Monthly	133.102(a)(4)(i)	92a.47(a)(1)
	40.0	Average Weekly	133.102(a)(4)(ii)	92a.47(a)(2)
	50.0	IMAX		
Total Suspended Solids	30.0	Average Monthly	133.102(b)(1)	92a.47(a)(1)
	45.0	Average Weekly	133.102(b)(2)	92a.47(a)(2)
	60.0	IMAX		
pH	6.0 – 9.0 S.U.	Min – Max	133.102(c)	95.2(1)
Fecal Coliform (5/1 – 9/30)	200 / 100 ml	Geo Mean	-	92a.47(a)(4)
Fecal Coliform (5/1 – 9/30)	1,000 / 100 ml	IMAX	-	92a.47(a)(4)
Fecal Coliform (10/1 – 4/30)	2,000 / 100 ml	Geo Mean	-	92a.47(a)(5)
Fecal Coliform (10/1 – 4/30)	10,000 / 100 ml	IMAX	-	92a.47(a)(5)
Total Residual Chlorine	0.5	Average Monthly	-	92a.48(b)(2)
	1.6	IMAX		
E. Coli	Report	IMAX	-	92a.61
Dissolved Oxygen	5.0	Minimum	-	BPJ

Water Quality-Based Limitations

The following limitations were determined through water quality modeling:

arameter	Limit (mg/l)	SBC	Model
Ammonia-Nitrogen	Report	Average Monthly	BPJ
Biochemical Oxygen Demand (BOD5) Raw Sewage Influent	Report	Average Monthly	POTW Requirement
BOD5 Minimum % Removal (%)	85%	Minimum Monthly Average	DRBC
Total Suspended Solids Raw Sewage Influent	Report	Average Monthly	POTW Requirement
Total Dissolved Solids	Report	Average Quarterly	DRBC
Nitrate-Nitrite as N	Report	Average Annually	Previous Permit
Total Nitrogen			
Total Kjeldahl Nitrogen			
Total Phosphorus			
Aluminum, Total	Report	1/6 Months	TMDL - AMD
Iron, Total			
Manganese, Total			

Anti-Backsliding

No limitations were made less stringent.

Modeling with State-Wide default LFY of 0.1 cfs/mi²:

$$\frac{0.1\ ft^3/sec}{mi^2} \times 741\ mi^2 = \frac{\mathbf{74.1\ ft^3}}{\mathbf{sec}}$$

Modeling Using StreamStats:

At Outfall 001 on Lehigh River:

RMI	Elevation (ft)	Drainage Area (mi²)	$Q_{7\text{-}10}$ Flow (cfs)
39.9	415.77	741	156

$$Low\ Flow\ Yield\ using\ StreamStats = \frac{156\ ft^3/sec}{741\ mi^2} = \mathbf{0.21}\ \frac{\mathbf{ft^3/sec}}{\mathbf{mi^2}}$$

StreamStats Report

Region ID:	PA
Workspace ID:	PA20221121173750567000
Clicked Point (Latitude, Longitude):	40.80423, -75.67138
Time:	2022-11-21 12:38:13 -0500

Parameter Code	Parameter Name	Value	Units
DRNAREA	Drainage Area	741	square miles

Statistic	Value	Unit
7 Day 2 Year Low Flow	242	ft^3/s
30 Day 2 Year Low Flow	291	ft^3/s
7 Day 10 Year Low Flow	156	ft^3/s

At confluence with "Nis Hollow" (3913):

RMI	Elevation (ft)	Drainage Area (mi^2)
39.80	411.61	743

StreamStats Report

Region ID:	PA
Workspace ID:	PA20221121174455560000
Clicked Point (Latitude, Longitude):	40.80296, -75.67239
Time:	2022-11-21 12:45:20 -0500

Parameter Code	Parameter Name	Value	Units
DRNAREA	Drainage Area	743	square miles

Modeling Using USGS Stream Gage

Stream Gage: 1451000 Leigh River at Walnutport, PA
Period of Record: 9/30/1946 – 11/19/2022

Basin Dimensional Characteristics

Characteristic Name	Value	Units
Drainage Area	889	square miles

Low-Flow Statistics

Statistic Name	Value	Units	Preferred?	Years of Record	Standard Error, percent	Citation	Comments
1 Day 10 Year Low Flow	203	cubic feet per second	✔	13		49	Statistic Date Range 4/1/1947 - 3/31/1960
7 Day 2 Year Low Flow	311	cubic feet per second	✔	13		49	Statistic Date Range 4/1/1947 - 3/31/1960
7 Day 10 Year Low Flow	213	cubic feet per second	✔	13		49	Statistic Date Range 4/1/1947 - 3/31/1960

$$Low\ Flow\ Yield\ using\ StreamStats\ Gage\ Data = \frac{213\ ft^3/sec}{889\ mi^2} = \mathbf{0.239}\ \frac{\boldsymbol{ft^3/sec}}{\boldsymbol{mi^2}}$$

$$Q_{7-10}\ at\ Outfall\ 001\ using\ StreamStats\ Gage\ Data = 0.239\ ft^3/sec \times 741\ mi^2 = \mathbf{177.1}\ \frac{\boldsymbol{ft^3/sec}}{\boldsymbol{mi^2}}$$

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
02C	3335	LEHIGH RIVER

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
39.900	Bowmanstown	PA0062910	0.140	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			3

TRC Calculation Using USGS StreamStats

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

156	= Q stream (cfs)	0.5	= CV Daily
0.14	= Q discharge (MGD)	0.5	= CV Hourly
30	= no. samples	1	= AFC_Partial Mix Factor
0.3	= Chlorine Demand of Stream	1	= CFC_Partial Mix Factor
0	= Chlorine Demand of Discharge	15	= AFC_Criteria Compliance Time (min)
0.5	= BAT/BPJ Value	720	= CFC_Criteria Compliance Time (min)
0	= % Factor of Safety (FOS)		=Decay Coefficient (K)

Source	Reference	AFC Calculations		Reference	CFC Calculations	
TRC	1.3.2.iii	WLA afc =	229.791	1.3.2.iii	WLA cfc =	224.021
PENTOXSD TRG	5.1a	LTAMULT afc =	0.373	5.1c	LTAMULT cfc =	0.581
PENTOXSD TRG	5.1b	LTA_afc=	85.626	5.1d	LTA_cfc =	130.235

Source		Effluent Limit Calculations		
PENTOXSD TRG	5.1f	AML MULT =	1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) =	0.500	BAT/BPJ
		INST MAX LIMIT (mg/l) =	1.635	

WLA afc	(.019/e(-k*AFC_tc)) + [(AFC_Yc*Qs*.019/Qd*e(-k*AFC_tc))...
	...+ Xd + (AFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)
LTAMULT afc	EXP((0.5*LN(cvh^2+1))-2.326*LN(cvh^2+1)^0.5)
LTA_afc	wla_afc*LTAMULT_afc
WLA_cfc	(.011/e(-k*CFC_tc) + [(CFC_Yc*Qs*.011/Qd*e(-k*CFC_tc))...
	...+ Xd + (CFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)
LTAMULT_cfc	EXP((0.5*LN(cvd^2/no_samples+1))-2.326*LN(cvd^2/no_samples+1)^0.5)
LTA_cfc	wla_cfc*LTAMULT_cfc
AML MULT	EXP(2.326*LN((cvd^2/no_samples+1)^0.5)-0.5*LN(cvd^2/no_samples+1))
AVG MON LIMIT	MIN(BAT_BPJ,MIN(LTA_afc,LTA_cfc)*AML_MULT)
INST MAX LIMIT	1.5*((av_mon_limit/AML_MULT)/LTAMULT_afc)

TRC Calculation Using State-wide Default

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

74.1	= Q stream (cfs)	0.5	= CV Daily
0.14	= Q discharge (MGD)	0.5	= CV Hourly
30	= no. samples	1	= AFC_Partial Mix Factor
0.3	= Chlorine Demand of Stream	1	= CFC_Partial Mix Factor
0	= Chlorine Demand of Discharge	15	= AFC_Criteria Compliance Time (min)
0.5	= BAT/BPJ Value	720	= CFC_Criteria Compliance Time (min)
0	= % Factor of Safety (FOS)		=Decay Coefficient (K)

Source	Reference	AFC Calculations	Reference	CFC Calculations
TRC	1.3.2.iii	WLA afc = 109.161	1.3.2.iii	WLA cfc = 106.416
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 40.676	5.1d	LTA_cfc = 61.865

Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AML MULT = 1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.500	BAT/BPJ
		INST MAX LIMIT (mg/l) = 1.635	

WLA afc	(.019/e(-k*AFC_tc)) + [(AFC_Yc*Qs*.019/Qd*e(-k*AFC_tc))...
	...+ Xd + (AFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)
LTAMULT afc	EXP((0.5*LN(cvh^2+1))-2.326*LN(cvh^2+1)^0.5)
LTA_afc	wla_afc*LTAMULT_afc
WLA_cfc	(.011/e(-k*CFC_tc) + [(CFC_Yc*Qs*.011/Qd*e(-k*CFC_tc))...
	...+ Xd + (CFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)
LTAMULT_cfc	EXP((0.5*LN(cvd^2/no_samples+1))-2.326*LN(cvd^2/no_samples+1)^0.5)
LTA_cfc	wla_cfc*LTAMULT_cfc
AML MULT	EXP(2.326*LN((cvd^2/no_samples+1)^0.5)-0.5*LN(cvd^2/no_samples+1))
AVG MON LIMIT	MIN(BAT_BPJ,MIN(LTA_afc,LTA_cfc)*AML_MULT)
INST MAX LIMIT	1.5*((av_mon_limit/AML_MULT)/LTAMULT_afc)

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DEPARTMENT OF ENVIRONMENTAL PROTECTION

Approve	Deny	Signatures	Date
X		/s/ Allison Seyfried / Project Manager	October 3, 2023
X		/s/ Amy M. Bellanca, P.E. / Program Manager	10-12-23