pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0024350**
Facility Type	**Municipal**	APS ID	**776931**
Major / Minor	**Minor**	Authorization ID	**1434788**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Dauphin Borough**	Facility Name	**Dauphin Borough STP**
Applicant Address	200 S Church Street (PO Box 487)	Facility Address	Delaware & Canal Streets
	Dauphin, PA 17018-0487		Dauphin, PA 17018
Applicant Contact	Brian Cuddy	Facility Contact	Troy Toland
Applicant Phone		Facility Phone	(717) 421-1228
Client ID	117433	Site ID	269990
Ch 94 Load Status	Not Overloaded	Municipality	Dauphin Borough
Connection Status	Self-Imposed Connection Prohibition	County	Dauphin
Date Application Received	April 3, 2023	EPA Waived?	Yes
Date Application Accepted	April 14, 2023	If No, Reason	

Purpose of Application: Permit renewal to discharge treated sewage.

Summary of Review

1.0 General Discussion

This fact sheet supports the renewal of an existing NPDES permit for discharge of treated domestic wastewater from Dauphin Borough's (Borough) wastewater treatment plant (WWTP). The Borough owns, operates, and maintains the WWTP. The facility is located in Dauphin Borough, Dauphin County. The WWTP services Dauphin Borough (95%) and Middle Paxton (5%). The sewer collection system is not combined, and no bypasses or overflows are authorized in the collection system. The facility is a sequential batch reactor (SBR) secondary treatment plant with annual average design capacity of 0.20 MGD and a hydraulic design capacity of 0.3 MGD. The organic design capacity of the facility is 417 lbs/day- BOD_5. The discharge goes to Susquehanna River which is classified for warm water fishes (WWF) and Migratory Fishes (MF). The existing NPDES permit was issued on September 24, 2018 with an effective date of October 1, 2018 and expiration date of September 30, 2023. The applicant submitted an administratively complete NPDES renewal application to the Department and is currently operating under the terms and conditions in the existing permit pending Department action on the renewal application. A topographical map showing the discharge location is presented in attachment A.

1.1 Sludge use and disposal description and location(s):

Sludge is digested in aerobic digesters and hauled off to Capital Region Water Advance Wastewater Treatment Facility in Harrisburg for further processing and disposal.

Approve	Deny	Signatures	Date
X		*J. Pascal Kwedza* J. Pascal Kwedza, P.E. / Environmental Engineer	April 12, 2024
X		*Maria D. Bebenek for* Daniel W. Martin, P.E. / Environmental Engineer Manager	April 17, 2024
X		*Maria D. Bebenek* Maria D. Bebenek, P.E. / Program Manager	April 17, 2024

Summary of Review

1.2 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.

1.3 Changes to the existing Permit

Quarterly E. Coli monitoring has been added.

1.4 Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	.2
Latitude	40º 21' 54"	Longitude	-76º 56' 4"
Quad Name		Quad Code	
Wastewater Description:	Sewage Effluent		
Receiving Waters	Susquehanna River (WWF, MF)	Stream Code	06685
NHD Com ID	56399881	RMI	79.23
Drainage Area	23423 sq. mi	Yield (cfs/mi^2)	0.10
Q_{7-10} Flow (cfs)	2342.3	Q_{7-10} Basis	USGS Gage Station
Elevation (ft)	311	Slope (ft/ft)	
Watershed No.	7-C	Chapter 93 Class.	WWF, MF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	Polychlorinated Biphenyls (PCBS)		
Source(s) of Impairment	Source Unknown		
TMDL Status		Name	

Background/Ambient Data		Data Source
pH (SU)		
Temperature (°F)		
Hardness (mg/L)		
Other:		

Nearest Downstream Public Water Supply Intake	Veolia Water PA		
PWS Waters	Susquehanna River	Flow at Intake (cfs)	
PWS RMI		Distance from Outfall (mi)	3

Changes Since Last Permit Issuance: None

1.4.1 Public Water Supply Intake

The closest water supply intake located downstream from the discharge is Veolia Water PA in Susquehanna Twp., Dauphin County. The distance downstream from the discharge to the intake is approximately 3 miles. No impact is expected on the intake as a result of this discharge.

2.0 Treatment Facility Summary

Treatment Facility Name: Dauphin STP

WQM Permit No.	Issuance Date
2290401 A-1	April 3, 2024
2290401	April 9,1990

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary	Sequencing Batch Reactor	Gas Chlorine	0.2

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.3	417	Not Overloaded	Aerobic Digestion	

Changes Since Last Permit Issuance: The facility was re-rated to a higher hydraulic capacity of 0.3MGD on 4/3/2024. The new permit addresses the projected hydraulic overload status of the facility. The facility has an approved corrective action plan to address I&I in the collection as needed.

2.1 Treatment Facility Details

The treatment facility composed of flow metering, screening, grit removal, influent pump station, 2 SBRs, 2 chlorine contact tanks, post aeration cascade and 2 aerobic digestion tanks. Influent enters the headworks from the collection system by gravity sewer line and from a force main from the Canal and Market Street pump station. At the headworks, influent is pretreated by an aerated grit chamber and an inline screening unit. Screened influent is metered and pumped to the two SBRs for biological treatment. Decanted effluent is disinfected with chlorine in the two chlorine contact tanks and discharge to the river via a post aeration cascade. Sludge is digested in the two aerobic digesters and hauled off site.

3.0 Existing Effluent Limitations and Monitoring Requirements

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	9.0 Daily Max	XXX	1/day	Grab
DO	XXX	XXX	5.0 Daily Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
CBOD5	41.7	66.7	XXX	25	40	50	1/week	24-Hr Composite
BOD5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	24-Hr Composite
TSS	50	75	XXX	30	45	60	1/week	24-Hr Composite
TSS Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	1/week	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/week	Grab
Nitrate-Nitrite	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/quarter	24-Hr Composite
Total Nitrogen	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/quarter	Calculation
Ammonia	Report	XXX	XXX	Report	XXX	XXX	1/week	24-Hr Composite
TKN	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/quarter	24-Hr Composite
Total Phosphorus	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/quarter	24-Hr Composite

3.1 Compliance History

3.1.1 DMR Data for Outfall 001 (from March 1, 2023 to February 29, 2024)

Parameter	FEB-24	JAN-24	DEC-23	NOV-23	OCT-23	SEP-23	AUG-23	JUL-23	JUN-23	MAY-23	APR-23	MAR-23
Flow (MGD) Average Monthly	0.127	0.229	0.123	0.083	0.083	0.095	0.092	0.104	0.078	0.113	0.081	0.103
Flow (MGD) Daily Maximum	0.171	0.963	0.378	0.186	0.137	0.249	0.198	0.230	0.121	0.423	0.122	0.202
pH (S.U.) Daily Minimum	6.95	6.77	6.67	6.86	7.11	7.07	7.00	7.08	7.08	6.99	6.74	6.95
pH (S.U.) Daily Maximum	7.2	7.16	7.04	7.23	7.26	7.26	7.29	7.29	7.28	7.12	7.09	7.09
DO (mg/L) Daily Minimum	8.13	8.08	7.96	8.06	7.99	8.05	8.01	7.78	7.87	8.11	7.85	8.08
TRC (mg/L) Average Monthly	0.40	0.30	0.40	0.30	0.40	0.40	0.40	0.50	0.40	0.5	0.40	0.30
TRC (mg/L) Instantaneous Maximum	0.75	0.51	0.61	0.55	0.57	0.65	0.66	0.81	0.61	0.71	0.61	0.56
CBOD5 (lbs/day) Average Monthly	2.0	7.4	4.0	3.9	4.2	3.6	6.0	4.7	2.8	3.9	2.8	2.2
CBOD5 (lbs/day) Weekly Average	2.2	11.5	5.3	5.5	5.7	4.9	17.7	9.5	3.4	6.6	4.1	2.9
CBOD5 (mg/L) Average Monthly	2	5	5	7	6	5	9	6	5	4	4	3
CBOD5 (mg/L) Weekly Average	2	12	9	10	8	6	29	10	6	5	4	4
BOD5 (lbs/day) Raw Sewage Influent Ave. Monthly	40	63	40	47	45	39	50	39	45	48	64	43
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	52	122	50	62	58	51	68	61	35	73	85	50
BOD5 (mg/L) Raw Sewage Influent Ave. Monthly	41.5	43	49.2	83.1	69.8	52.9	68.3	47.9	70.7	49.2	86.6	59.2
TSS (lbs/day) Average Monthly	5	12	5	3	5	6	7	5	4	6	4	4
TSS (lbs/day) Raw Sewage Influent Ave. Monthly	21	21	18	22	17	29	24	11	17	27	21	39

TSS (lbs/day) Raw Sewage Influent Daily Maximum	35	40	21	31	23	38	38	12	26	35	28	95
TSS (lbs/day) Weekly Average	5	25	8	4	7	9	16	7	6	8	5	5
TSS (mg/L) Average Monthly	5	7	6	6	8	7	10	6	6	6	5	5
TSS (mg/L) Raw Sewage Influent Ave. Monthly	22	13	21	38	26	38	32	14	26	26	29	54
TSS (mg/L) Weekly Average	5	15	8	7	10	9	27	7	9	8	5	5
Fecal Coliform (No./100 ml) Geometric Mean	1	5	3	3	1	5	2	1	1	2	1	4
Fecal Coliform (No./100 ml) Instant. Maximum	1	25	7	210	1	64	2	4	1	5	2	20
Nitrate-Nitrite (mg/L) Daily Maximum			1			1			1			1
Total Nitrogen (mg/L) Daily Maximum			19.6			5			5.9			2.5
Ammonia (lbs/day) Average Monthly	0.7	2	0.7	3	6	6	4	5	7	174	0.2	2
Ammonia (mg/L) Average Monthly	0.7	0.66	0.8	5.69	9.1	8.13	5.89	6.56	11.1	5.974	0.275	2.322
TKN (mg/L) Daily Maximum			12			8.9			7.6			3.4
Total Phosphorus (mg/L) Daily Maximum			2.1			1.5			1.4			2

3.1.2 Summary of DMRs:

DMRs review for the facility for the last 12 months of operation, presented on the table above in section 3.1.1 indicates permit limits have been met most of the time. No effluent violations noted during the period reviewed.

3.1.3 Summary of Inspections:

The facility has been inspected a couple of times during the previous permit cycle. No effluent violations were found during plant inspections. The facility is operated and maintained well.

4.0 Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** .2
Latitude 40º 21' 53.00" **Longitude** -76º 56' 4.00"
Wastewater Description: Sewage Effluent

4.1 Basis for Effluent Limitations

In general, the Clean Water Act (CWA) requires that the effluent limits for a particular pollutant be the more stringent of either technology-based limits or water quality-based limits. Technology-based limits are set according to the level of treatment that is achievable using available technology. A water quality-based effluent limit is designed to ensure that the water quality standards applicable to a waterbody are being met and may be more stringent than technology-based effluent limits.

4.2 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	Average Monthly	133.102(a)(4)(i)	92a.47(a)(1)
	40	Average Weekly	133.102(a)(4)(ii)	92a.47(a)(2)
Total Suspended Solids	30	Average Monthly	133.102(b)(1)	92a.47(a)(1)
	45	Average Weekly	133.102(b)(2)	92a.47(a)(2)
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)

Comments: None

4.3 Water Quality-Based Limitations

4.3.1 Mass-Based Limits

The federal regulation at 40 CFR 122.45(f) requires that effluent limits be expressed in terms of mass, if possible. The regulation at 40 CFR 122.45(b) requires that effluent limitations 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

4.3.2 WQM 7.0 Stream Model

WQM 7.0 is a water quality model DEP utilizes to establish appropriate effluent limits for $CBOD_5$, NH_3-N and DO in permits. The model simulates mixing and degradation of NH_3-N in the stream and compares calculated instream NH_3-N concentrations to NH_3-N water quality criteria and also simulates mixing and consumption of

D.O. in the stream due to the degradation of $CBOD_5$ and NH_3N and compares calculated instream D.O. concentrations to D.O. water quality criteria and recommends effluent limits

4.3.3 Receiving Stream

The receiving stream is the Susquehanna River. According to 25 PA § 93.9o, this stream is protected for Warm Water Fishes (WWF) and Migratory Fishes (MF). It is located in Drainage List o and State Watershed 7-C. It has been assigned stream code 06685. According to the Department's Integrated Water Quality Monitoring and Assessment Report, this segment of Susquehanna River, is impaired for fish consumption due to PCB. See section 5.4 for further discussions.

4.3.4 Streamflow:

Streamflows for the water quality analysis were determined by correlating with the yield of USGS gauging station No. 01570500 on Susquehanna River in Harrisburg. The Q_{7-10} and drainage area at the gage is 2610 ft^3/s and 24100mi^2 respectively. The resulting yields are as follows:

- Q_{7-10} = (2610 ft^3/s)/ 24100 mi^2 = 0.10 $ft^3/s/ mi^2$
- Q_{30-10} / Q_{7-10} = 1.17
- Q_{1-10} / Q_{7-10} = 0.95

The drainage area at discharge taken from the previous protection report = 23,423 mi^2

The Q_{7-10} at discharge = 23,423 mi^2 x 0.10 $ft^3/s/mi^2$ = 2,342.3 ft^3/s.

For WQM modelling purposes, 25% of the flow will be used.

Q_{7-10} model = 2,342.3 ft^3/s. x 0.25 = 585.6 ft^3/s

4.3.5 NH_3N Calculations

NH_3N calculations will be based on the Department's Implementation Guidance of Section 93.7 Ammonia Criteria, dated 11/4/97 (ID No. 391-2000-013). The following data is necessary to determine the instream NH_3N criteria used in the water quality modeling of the stream:

* Discharge pH = 7.1 (July -Sept DMR median)
* Discharge Temperature = 25 ^{o} C (Default)
* Stream pH = 8.2 (Taken from WQN station at Harrisburg)
* Stream Temperature = 23.5^{o}C (Taken from WQN station at Harrisburg)
* Background NH_3-N = 0.0 (default)

4.3.6 $CBOD_5$

WQM 7.0 Model was used analyze the discharge from Dauphin Borough. The model results presented in attachment B indicate that, for the Dauphin Borough STP discharge of 0.2 MGD, an average monthly limit (AML) of 25mg/l $CBOD_5$ is required to protect the water quality of the stream. This limit is consistent with the existing permit and the STP has been consistently achieving below this limitation. Therefore, a limit of 25mg/l AML, 40mg/l average weekly limit (AWL) and 50 mg/l IMAX is recommended for this permit cycle. Mass limits are calculated as follows:

Mass based AML (lb/day) = 25 (mg/L) × 0.2(mgd) × 8.34 = 41.7
Mass based AWL (lb/day) = 40(mg/L) × 0.2(mgd) × 8.34 = 66.7

4.3.7 NH_3-N

The attached model results of the WQM 7.0 stream model (attachment B) also indicates that no limitation on NH_3 as a monthly average is necessary to protect the aquatic life from toxicity effects. However, weekly ammonia monitoring will be required in the permit to ensure treatment efficiency.

4.3.8 Dissolved Oxygen

The existing permit contains a limit of 5 mg/l for Dissolved Oxygen (DO). DEP's Technical Guidance for the Development and Specification of Effluent Limitations (362-0400-001, 10/97) suggests that either the adopted minimum stream D.O. criteria for the receiving stream or the effluent level determined through water quality modeling be used for the limit. Since the WQM 7.0 model was run using a minimum D.O. of 5.0 mg/l, this limit will be continued in the renewed permit with a daily monitoring requirement.

4.3.9 Total Suspended Solids(TSS):

There is no water quality criterion for TSS. A limit of 30 mg/l AML will be required based on the minimum level of effluent quality attainable by secondary treatment as defined in 40 CFR 133.102b(1) and 25 PA § 92a.47(a)(1) and an AWL of 45mg/l per 40CFR 133.102(b)(2) and 25 PA § 92a.47(a)(2)

Mass based AML (lb/day) = 30 (mg/L) × 0.2(mgd) × 8.34 = 50.04
Mass based AWL (lb/day) = 45(mg/L) × 0.2(mgd) × 8.34 = 75.06

4.3.10 Total Residual Chlorine

The attached TRC calculation results presented in attachment D utilizes the equations and calculations as presented in the Department's May 1, 2003 Implementation Guidance for Total Residual Chlorine (TRC) (ID No. 391-2000-015) for developing chlorine limitations. The Guidance references Chapter 92a, Section 92a.48 (b) which establishes a standard BAT limit of 0.5 mg/l unless a facility-specific BAT has been developed. TRC calculation was run using a PMFs of 0.011 AFC & 0.075 CFC taken from Toxics Management Spreadsheet used to analyzed reasonable potential. The results presented in attachment D indicates that a technology limit of 0.5 mg/l monthly average and IMAX of 1.6 mg/l would be needed to prevent toxicity concerns. This is consistent with the existing permit and will remain for the current permit renewal. DMR and inspection reports indicate the facility has been complying with the limitation consistently.

4.3.11 Toxics

A reasonable potential (RP) analysis was done for pollutants sampled in support of the permit renewal application. All pollutants that were presented in the application sampling data were entered into DEP's Toxics Management Spreadsheet (TMS) to calculate WQBELs. The results of the TMS are presented in attachment C. The results of the TMS indicate discharge levels for all pollutants are well below DEP's target quantitation limits and the calculated WQBELs, therefore, no monitoring or limitation was recommended. The recommended limitations follow the logic presented in DEPs SOP, to establish limits in the permit where the maximum reported concentration exceeds 50% of the WQBEL, or for non-conservative pollutants to establish monitoring requirements where the maximum reported concentration is between 25% - 50% of the WQBEL, or to establish monitoring requirements for conservative pollutants where the maximum reported concentration is between 10% - 50% of the WQBEL

4.3.12 Fecal Coliform and E. Coli

The existing Fecal Coliform limit is consistent with the technology limits recommended in 92a.47(a)(4) and (a)(5) and will remain in the permit. In March of 2021, EPA approved DEP's Triennial Review of Water Quality Standards, which included a new swimming season criterion for E. coli. As a result, DEP is including monitoring

requirements for E. Coli in new and renewed sewage permits above 2000gpd. Monitoring frequency is based on annual average flow as follows: 1/month for design flows >= 1 MGD, 1/quarter for design flows >= 0.05 and < 1 MGD and 1/year for design flows of 0.002 and < 0.05 MGD. Your discharge of 0.2MGD requires 1/quarter monitoring as included in the permit.

4.3.13 Chesapeake Bay Strategy:

The Department formulated a strategy in April 2007, to comply with the EPA and Chesapeake Bay requirements to reduce point source loadings of Total Nitrogen (TN) and Total Phosphorus (TP) to the Bay. In the Strategy, sewage dischargers have been prioritized by DEP based on their delivered TN loadings to the Bay. The highest priority (Phases 1, 2, and 3) dischargers received annual loading caps based on their design flow on August 29, 2005 and concentrations of 6 mg/l TN and 0.8 mg/l TP. Phase 4 (0.2 -0.4mgd) and Phase 5(below 0.2mdg) are required to monitor and report TN and TP during permit renewal and any facility in Phases 4 and 5 that undergoes expansion is subjected to cap load right away. EPA published Chesapeake Bay TMDL in December of 2010. In order to address the TMDL, Pennsylvania developed Chesapeake Watershed Implementation Plan (WIP) Phase 1, Phase 2 and currently Phase 3 WIP and a supplement to the WIPs to be implemented with the original Chesapeake Bay Strategy.

Phase 3 WIP and the supplement to the WIP, indicates renewing permits for significant dischargers would follow the same phased approach formulated in the original Bay strategy whilst Phase 4 and Phase 5 will be required to monitor and report TN and TP during permit renewals. This facility is, classified as a phase 5, has been and will continue monitoring and reporting Total Phosphorus, Nitrate-Nitrite as N, Total Kjeldahl Nitrogen and Total Nitrogen quarterly throughout the next permit cycle.

4.4.14 Influent BOD and TSS Monitoring

The permit includes influent BOD5 and TSS monitoring at the same frequency as is done for effluent in order to implement Chapter 94.12 and assess percent removal requirements.

4.4.15 Stormwater

There is no stormwater outfall associated with this facility.

4.4.16 Industrial Users

This Wastewater Treatment Plant does not receive wastewater from any significant industrial users.

4.4.17 Pretreatment Requirements

The design annual average flow of the treatment plant is 0.2 MGD and the facility receives no flow from significant Industrial users. EPA does not require development of pretreatment program for facilities with design flow less than 5MGD. However, the permit contains standard conditions requiring the permittee to monitor and control industrial users if applicable.

5.0 Other Considerations

5.1 Anti-backsliding

Not applicable to this permit

5.2 Anti-Degradation (93.4)

The effluent limits for this discharge have been developed to ensure that existing instream water uses and the level of water quality necessary to protect the existing uses are maintained and protected. No High-Quality Waters are impacted by this discharge. No Exceptional Value Waters are impacted by this discharge.

5.3 Class A Wild Trout Fisheries

No Class A Wild Trout Fisheries are impacted by this discharge.

5.4 303d Listed Streams

The discharge is located on a 303d listed stream segment. It is impaired for fish consumption by PCB. The source of the impairment is unknown. This discharge does not contribute to the impairment; therefore, no action is warranted at this time.

5.5 Special Permit Conditions

The permit contains the following special conditions:

- Stormwater Prohibition, Approval Contingencies, Solids Management and Restriction on receipt of hauled in waste under certain conditions, SBR discharge condition and chlorine minimization requirement.

5.6 Basis for Effluent and Surface Water Monitoring

Section 308 of the CWA and federal regulation 40 CFR 122.44(i) require monitoring in permits to determine compliance with effluent limitations. Monitoring may also be required to gather effluent and surface water data to determine if additional effluent limitations are required and/or to monitor effluent impacts on receiving water quality. The permittee is responsible for conducting the monitoring and for reporting results on Discharge Monitoring Reports (DMRs).

5.7 Effluent Monitoring Frequency

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 can be used for averaging if they are conducted using EPA-approved test methods (generally found in 40 CFR 136) and if the Method Detection Limits are less than the effluent limits. The sampling location must be after the last treatment unit and prior to discharge to the receiving water. If no discharge occurs during the reporting period, "no discharge" shall be reported on the DMR.

6.0 Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (386-0400-001), SOPs and/or BPJ.

Outfall 001, Effective Period: Permit Effective Date through Permit Expiration Date.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	9.0 Daily Max	XXX	1/day	Grab
DO	XXX	XXX	5.0 Daily Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
CBOD5	41.7	66.7	XXX	25	40	50	1/week	24-Hr Composite
BOD5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	24-Hr Composite
TSS	50	75	XXX	30	45	60	1/week	24-Hr Composite
TSS Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	1/week	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/week	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/quarter	Grab
Nitrate-Nitrite	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/quarter	24-Hr Composite
Total Nitrogen	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/quarter	Calculation

Outfall 001 , Continued (from Permit Effective Date through Permit Expiration Date)

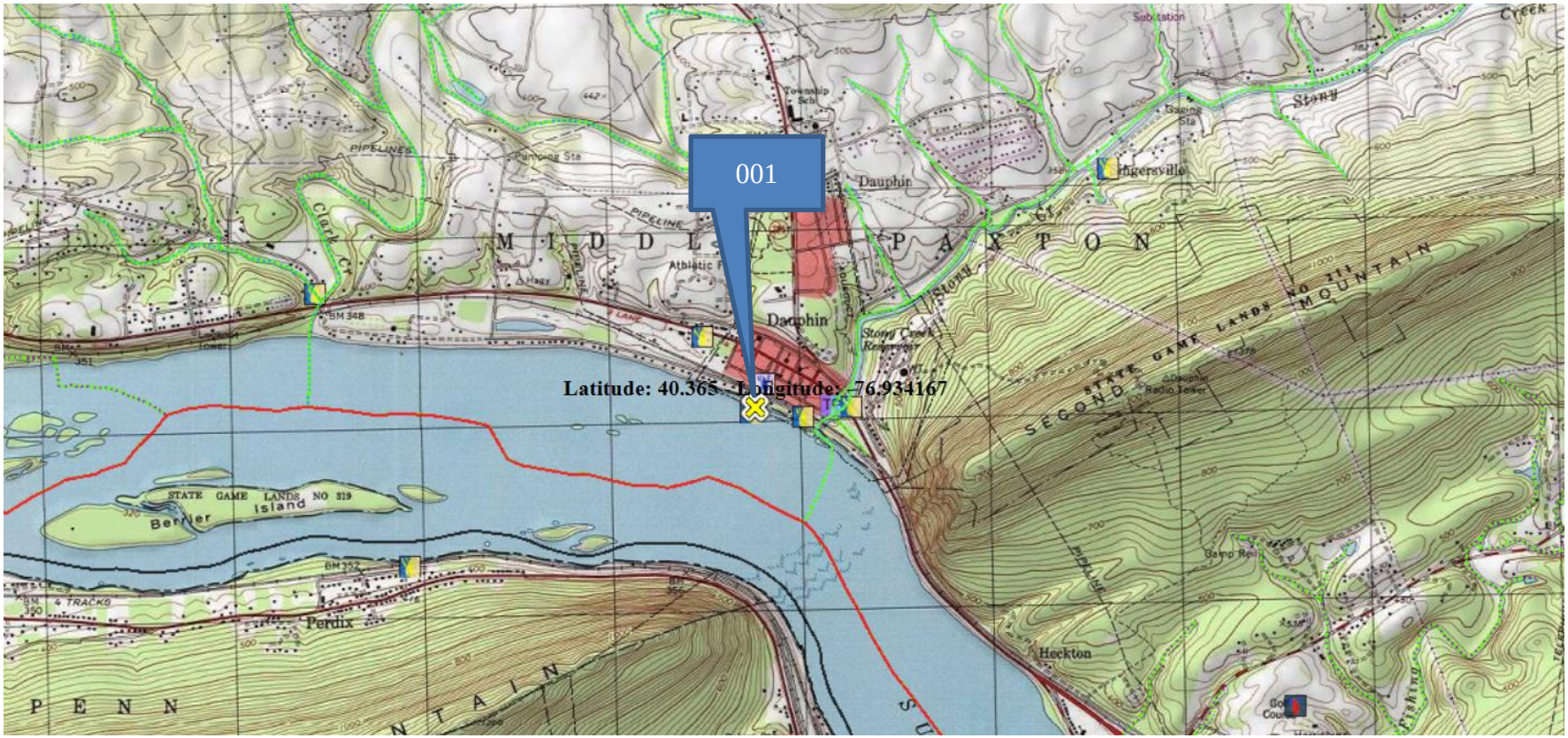
Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Ammonia	Report	XXX	XXX	Report	XXX	XXX	1/week	24-Hr Composite
TKN	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/quarter	24-Hr Composite
Total Phosphorus	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/quarter	24-Hr Composite

Compliance Sampling Location: At Outfall 001

7.0 Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment **B**)
☒	Toxics Management Spreadsheet (see Attachment **C**)
☒	TRC Model Spreadsheet (see Attachment **D**)
☐	Temperature Model Spreadsheet (see Attachment)
☒	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
☒	Technical Guidance for the Development and Specification of Effluent Limitations, 386-0400-001, 10/97.
☐	Policy for Permitting Surface Water Diversions, 386-2000-019, 3/98.
☒	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 386-2000-018, 11/96.
☐	Technology-Based Control Requirements for Water Treatment Plant Wastes, 386-2183-001, 10/97.
☐	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 386-2183-002, 12/97.
☐	Pennsylvania CSO Policy, 386-2000-002, 9/08.
☒	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
☐	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 386-2000-008, 4/97.
☒	Determining Water Quality-Based Effluent Limits, 386-2000-004, 12/97.
☐	Implementation Guidance Design Conditions, 386-2000-007, 9/97.
☒	Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 386-2000-016, 6/2004.
☐	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 386-2000-012, 10/1997.
☐	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 386-2000-009, 3/99.
☐	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 386-2000-015, 5/2004.
☒	Implementation Guidance for Section 93.7 Ammonia Criteria, 386-2000-022, 11/97.
☐	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 386-2000-013, 4/2008.
☒	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 386-2000-011, 11/1994.
☐	Implementation Guidance for Temperature Criteria, 386-2000-001, 4/09.
☒	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 386-2000-021, 10/97.
☐	Implementation Guidance for Application of Section 93.5(e) for Potable Water Supply Protection Total Dissolved Solids, Nitrite-Nitrate, Non-Priority Pollutant Phenolics and Fluorides, 386-2000-020, 10/97.
☐	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 386-2000-005, 3/99.
☐	Implementation Guidance for the Determination and Use of Background/Ambient Water Quality in the Determination of Wasteload Allocations and NPDES Effluent Limitations for Toxic Substances, 386-2000-010, 3/1999.
☐	Design Stream Flows, 386-2000-003, 9/98.
☐	Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 386-2000-006, 10/98.
☐	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 386-3200-001, 6/97.
☒	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
☒	SOP: Establishing
☐	Other:

8. Attachments

A. Topographical Map



B. WQM Model Results

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
07K	6685	SUSQUEHANNA 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)
79.230	Dauphin Boro	PA0024350	0.200	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			5

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Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
07K	6685	SUSQUEHANNA RIVER	**79.230**	311.00	23423.00	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.100	0.00	585.60	0.000	0.000	0.0	0.00	0.00	23.50	8.20	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Dauphin Boro	PA0024350	0.2000	0.2000	0.2000	0.000	25.00	7.10

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	5.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
07K	6685	SUSQUEHANNA RIVER	**76.000**	300.00	23564.00	0.00000	3.75	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.100	0.00	0.00	0.000	0.000	0.0	0.00	0.00	23.50	8.20	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Veolia Water	PA0014621	0.5440	0.5440	0.5440	0.000	25.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	5.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
07K	6685	SUSQUEHANNA RIVER

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Reach Trav Time (days)	Analysis Temp (°C)	Analysis pH
Q7-10 Flow												
79.230	585.60	0.00	585.60	.3094	0.00064	1.274	546.99	429.44	0.84	0.235	23.50	8.20
Q1-10 Flow												
79.230	556.32	0.00	556.32	.3094	0.00064	NA	NA	NA	0.82	0.242	23.50	8.20
Q30-10 Flow												
79.230	685.15	0.00	685.15	.3094	0.00064	NA	NA	NA	0.92	0.215	23.50	8.20

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	☑
WLA Method	EMPR	Use Inputted W/D Ratio	☐
Q1-10/Q7-10 Ratio	0.95	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.17	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	5		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
07K	6685	SUSQUEHANNA RIVER

NH3-N Acute Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
79.230	Dauphin Boro	2	50	2	50	0	0

NH3-N Chronic Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
79.230	Dauphin Boro	.46	25	.46	25	0	0

Dissolved Oxygen Allocations

RMI	Discharge Name	CBOD5		NH3-N		Dissolved Oxygen		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
79.23	Dauphin Boro	25	25	25	25	5	5	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
07K	6685	SUSQUEHANNA RIVER

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
79.230	0.200	23.501	8.197
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
546.990	1.274	429.441	0.841
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.01	0.008	0.01	0.916
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
8.241	2.749	Tsivoglou	5
Reach Travel Time (days)			
0.235			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.023	2.01	0.01	7.74
0.047	2.01	0.01	7.74
0.070	2.01	0.01	7.74
0.094	2.01	0.01	7.74
0.117	2.01	0.01	7.74
0.141	2.01	0.01	7.74
0.164	2.01	0.01	7.74
0.188	2.01	0.01	7.74
0.211	2.01	0.01	7.74
0.235	2.01	0.01	7.74

C. TMS Results

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.4, May 2023

Discharge Information

Instructions | Discharge | Stream

Facility: Dauphin Borough NPDES Permit No.: PA0024350 Outfall No.: 001

Evaluation Type: Major Sewage / Industrial Waste Wastewater Description: Sewage

Discharge Characteristics								
Design Flow (MGD)*	Hardness (mg/l)*	pH (SU)*	Partial Mix Factors (PMFs)				Complete Mix Times (min)	
			AFC	CFC	THH	CRL	Q_{7-10}	Q_h
0.2	100	7.1						

					0 if left blank		*0.5 if left blank*		*0 if left blank*			*1 if left blank*	
	Discharge Pollutant	Units	Max Discharge Conc		Trib Conc	Stream Conc	Daily CV	Hourly CV	Stream CV	Fate Coeff	FOS	Criteria Mod	Chem Transl
Group 1	Total Dissolved Solids (PWS)	mg/L		328									
	Chloride (PWS)	mg/L		104									
	Bromide	mg/L		1.1									
	Sulfate (PWS)	mg/L		34.4									
	Fluoride (PWS)	mg/L	<										
Group 2	Total Aluminum	µg/L											
	Total Antimony	µg/L	<										
	Total Arsenic	µg/L											
	Total Barium	µg/L											
	Total Beryllium	µg/L	<										
	Total Boron	µg/L	<										
	Total Cadmium	µg/L	<										
	Total Chromium (III)	µg/L	<										
	Hexavalent Chromium	µg/L	<										
	Total Cobalt	µg/L	<										
	Total Copper	µg/L		15									
	Free Cyanide	µg/L											
	Total Cyanide	µg/L	<										
	Dissolved Iron	µg/L	<										
	Total Iron	µg/L											
	Total Lead	µg/L		3									
	Total Manganese	µg/L											
	Total Mercury	µg/L	<										
	Total Nickel	µg/L											
	Total Phenols (Phenolics) (PWS)	µg/L	<										
	Total Selenium	µg/L	<										
	Total Silver	µg/L	<										
	Total Thallium	µg/L	<										
	Total Zinc	µg/L	<	0.88									
	Total Molybdenum	µg/L	<										

Stream / Surface Water Information

Dauphin Borough, NPDES Permit No. PA0024350, Outfall 001

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **Susquehanna River**

No. Reaches to Model: 1

(●) Statewide Criteria
( ) Great Lakes Criteria
( ) ORSANCO Criteria

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi^2)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	006685	79.23	311	23423			Yes
End of Reach 1	006685	76	300	23842		100	Yes

Q_{7-10}

Location	RMI	LFY (cfs/mi^2)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	79.23	0.1										100	7		
End of Reach 1	76	0.1													

Q_h

Location	RMI	LFY (cfs/mi^2)	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	79.23														
End of Reach 1	76														

Model Results

Dauphin Borough, NPDES Permit No. PA0024350, Outfall 001

Instructions | *Results* | RETURN TO INPUTS | SAVE AS PDF | PRINT | (●) All ( ) Inputs ( ) Results ( ) Limits

☐ ***Hydrodynamics***

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 15 PMF: 0.011 Analysis Hardness (mg/l): 100 Analysis pH: 7.00

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	13.439	14.0	1,127	Chem Translator of 0.96 applied
Total Lead	0	0		0	64.581	81.6	6,574	Chem Translator of 0.791 applied
Total Zinc	0	0		0	117.180	120	9,648	Chem Translator of 0.978 applied

☑ ***CFC*** CCT (min): 720 PMF: 0.073 Analysis Hardness (mg/l): 100 Analysis pH: 7.00

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	8.956	9.33	5,149	Chem Translator of 0.96 applied
Total Lead	0	0		0	2.517	3.18	1,756	Chem Translator of 0.791 applied
Total Zinc	0	0		0	118.139	120	66,133	Chem Translator of 0.986 applied

☑ ***THH*** CCT (min): ###### THH PMF: 0.073 Analysis Hardness (mg/l): N/A Analysis pH: N/A PWS PMF: 0.0338

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	500,000	500,000	#########	WQC applied at RMI 76 with a design stream flow of 2384.2 cfs
Chloride (PWS)	0	0		0	250,000	250,000	65,416,190	WQC applied at RMI 76 with a design stream flow of 2384.2 cfs
Sulfate (PWS)	0	0		0	250,000	250,000	65,416,190	WQC applied at RMI 76 with a design stream flow of 2384.2 cfs
Total Copper	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	

☑ ***CRL*** CCT (min): 720 PMF: 0.102 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	

☑ ***Recommended WQBELs & Monitoring Requirements***

No. Samples/Month: 4

	Mass Limits		*Concentration Limits*						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments

☑ ***Other Pollutants without Limits or Monitoring***

The following pollutants do not require effluent limits or monitoring based on water quality because reasonable potential to exceed water quality criteria was not determined and the discharge concentration was less than thresholds for monitoring, or the pollutant was not detected and a sufficiently sensitive analytical method was used (e.g., <= Target QL).

Pollutants	Governing WQBEL	Units	Comments
Total Dissolved Solids (PWS)	130,832	mg/L	Discharge Conc ≤ 10% WQBEL
Chloride (PWS)	65,416	mg/L	Discharge Conc ≤ 10% WQBEL
Bromide	N/A	N/A	No WQS
Sulfate (PWS)	65,416	mg/L	Discharge Conc ≤ 10% WQBEL
Total Copper	723	µg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	1,756	µg/L	Discharge Conc ≤ 10% WQBEL
Total Zinc	N/A	N/A	Discharge Conc < TQL

D. TRC Calculations

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

2342.3	= Q stream (cfs)	0.5	= CV Daily
0.2	= Q discharge (MGD)	0.5	= CV Hourly
30	= no. samples	0.011	= AFC_Partial Mix Factor
0.3	= Chlorine Demand of Stream	0.075	= 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)	0	=Decay Coefficient (K)

Source	Reference	AFC Calculations	Reference	CFC Calculations
TRC	1.3.2.iii	WLA afc = 26.584	1.3.2.iii	WLA cfc = 176.592
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 9.906	5.1d	LTA_cfc = 102.662

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)**