pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0248037**
Facility Type	**Municipal**	APS ID	**568712**
Major / Minor	**Minor**	Authorization ID	**1182667**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Bethel Township Municipal Authority**	Facility Name	**Bethel Village STP**
Applicant Address	PO Box 274 (60 Klahr Road)	Facility Address	8275 Lancaster Avenue
	Bethel, PA 19507		Bethel, PA 19507
Applicant Contact	Harold Gruber	Facility Contact	Michael Kreiser
Applicant Phone	(717) 933-8813	Facility Phone	(610) 589-4023
Client ID	243378	Site ID	663972
Ch 94 Load Status	Not Overloaded	Municipality	Bethel Township
Connection Status	No Limitations	County	Berks
Date Application Received	May 2, 2017	EPA Waived?	Yes
Date Application Accepted	July 13, 2017	If No, Reason	

Purpose of Application: NPDES 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 a treatment plant that serves the Village of Bethel area in Bethel Township, Berks County. Bethel Township Municipal Authority owns, operates, and maintains the wastewater treatment plant known as the Bethel Village STP. The facility is located in Bethel Township, Berks County. The sewer collection system is not combined in these areas and there are no bypasses or overflows approved in the collection system. The plant is a dual train Dutchland extended aeration secondary treatment plant with capability to nitrify and denitrify using Modified Ludzack-Ettinger (MLE) process and discharges to Little Swatara Creek, which is classified for cold water fishes (CWF) and Migratory Fishes (MF). The treatment plant has an annual average design flow of 0.205 MGD and organic design capacity of 427 lbs/day- BOD5. The plant also accepts residential septage and holding tank waste into a manhole upstream of headworks of the plant. The existing NPDES permit was issued on October 26, 2012 with an effective date of November 1, 2012 and expiration date of October 31, 2017. The facility submitted a timely permit renewal application to the Department and has been operating under the terms and conditions in the existing permit pending Department action on the renewal application.

A topographic map showing the discharge location is presented in attachment A.

1.1 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-

Approve	Deny	Signatures	Date
X		*J. Pascal Kwedza* J. Pascal Kwedza, P.E. / Environmental Engineer	January 13, 2021
X		Daniel W. Martin, P.E. / Environmental Engineer Manager	January 25, 2021
X		Maria Bebenek, P.E.,/ Program Manager	January 25, 2021

Summary of Review

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.

1.2 Existing Permit Limits and Monitoring Requirements

Discharge Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Monthly Average	Weekly Average	Minimum	Monthly Average	Weekly Average	Instantaneous Maximum		
Flow (mgd)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
D.O	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
TSS	51	76	XXX	30	45	60	1/Week	24-hr comp
$CBOD_5$	26	39	XXX	15	22.5	30	1/Week	24-hr comp
Fecal Coliform (5/1 to 9/30)[(5)]	XXX	XXX	XXX	200	XXX	1,000	1/Week	Grab
Fecal Coliform (10/1 to 4/30)	XXX	XXX	XXX	2,000	XXX	10,000	1/Week	Grab
Ammonia Nov 1 - Apr 30	25	XXX	XXX	15.0	XXX	30	1/week	24-Hr Composite
Ammonia May 1 - Oct 31	8.5	XXX	XXX	5.0	XXX	10	1/week	24-Hr Composite
Kjeldahl---N	Report	XXX	XXX	Report	XXX	XXX	1/month	24-hr Comp
Nitrate-Nitrite as N	Report	XXX	XXX	Report	XXX	XXX	1/month	24-hr Comp
Total Nitrogen	Report	XXX	XXX	Report	XXX	XXX	1/month	Calculate
Total Phosphorus	Report	XXX	XXX	Report	XXX	XXX	1/month	24-hr Comp

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	.205
Latitude	40º 27' 36.12"	Longitude	-76º 16' 54.88"
Quad Name		Quad Code	
Wastewater Description:	Sewage Effluent		
Receiving Waters	Little Swatara Creek (CWF, MF)	Stream Code	09888
NHD Com ID	56395553	RMI	16.57
Drainage Area	19.86	Yield (cfs/mi^2)	0.0656
Q_{7-10} Flow (cfs)	1.3	Q_{7-10} Basis	USGS gauging station No 01573000
Elevation (ft)		Slope (ft/ft)	
Watershed No.	7-D	Chapter 93 Class.	CWF, MF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment			
Source(s) of Impairment			
TMDL Status		Name	

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

Nearest Downstream Public Water Supply Intake	PA American Water Company		
PWS Waters	Swatara Creek	Flow at Intake (cfs)	39
PWS RMI		Distance from Outfall (mi)	

Changes Since Last Permit Issuance: None

1.5 Water Supply Intake:

The closest water supply intake located downstream from the discharge is Pennsylvania American Water Company in South Hanover Township, Dauphin County on Swatara Creek. The distance downstream from the discharge to the intake is approximately 39 miles. No impact is expected from this discharge.

2.0 Treatment Facility Summary

Treatment Facility Name: Bethel Village STP & Sewer System

WQM Permit No.	Issuance Date
0606407	January 5, 2007

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary With Total Nitrogen Reduction	Extended Aeration	Ultraviolet	0.205

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.205	427	Not Overloaded	Aerobic Digestion	Combination of methods

Changes Since Last Permit Issuance:

2.1 Treatment Facility

The treatment plant consists of comminutor, an influent lift station, mechanical fine screen/bar screen, flow splitter, equalization tank, 2 anoxic tanks, 2 aeration basins, 2 clarifiers, UV for disinfection, a sludge holding tank and post aeration. The plant operates dual trains utilizing the MLE process for biological nutrient removal.

2.2 Chemicals

Soda ash is used for PH adjustment as needed and Poly Aluminum Carbonate is used for Phosphorus removal and settling.

3.0 Compliance History

3.1 DMR Data for Outfall 001 (from December 1, 2019 to November 30, 2020)

Parameter	NOV-20	OCT-20	SEP-20	AUG-20	JUL-20	JUN-20	MAY-20	APR-20	MAR-20	FEB-20	JAN-20	DEC-19
Flow (MGD) Average Monthly	0.0345	0.0382	0.0489	0.0723	0.0551	0.0575	0.0562	0.053	0.0585	0.0476	0.0548	0.0528
Flow (MGD) Daily Maximum	0.0723	0.0699	0.0888	0.1625	0.0975	0.1238	0.1268	0.0998	0.1025	0.072	0.1223	0.0765
pH (S.U.) Minimum	6.89	7.02	7.13	7.02	7.08	6.91	6.99	6.93	6.84	6.94	6.17	6.65
pH (S.U.) Maximum	7.54	7.63	7.61	8.12	7.83	7.55	7.77	7.82	7.87	7.69	7.59	7.72
DO (mg/L) Minimum	7.48	6.58	6.72	7.2	6.61	5.72	7.64	8.1	8.76	9.05	8.58	8.26
CBOD5 (lbs/day) Average Monthly	2	3	1	< 2	1	2	3	< 2	1	< 2	< 2	< 2
CBOD5 (lbs/day) Weekly Average	3	3	2	< 2	2	3	4	4	2	4	3	2
CBOD5 (mg/L) Average Monthly	5.5	6	3.1	< 2.3	2.5	3.7	4.9	< 3.5	2.7	< 4.2	< 3.9	< 3.5
CBOD5 (mg/L) Weekly Average	6.5	6.3	5.4	2.4	2.8	5.7	6.1	6.0	3.0	7.6	5.2	5.8
BOD5 (lbs/day) Raw Sewage Influent Ave. Monthly	140	234	138	139	255	99	144	114	151	150	138	133
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	243	391	200	150	422	127	192	153	172	180	186	174
BOD5 (mg/L) Raw Sewage Influent Ave. Monthly	370	483	387	191	575	227	248	200	290	317	247	253
TSS (lbs/day) Average Monthly	8	16	5	< 4	< 3	7	12	< 7	< 3	< 4	< 5	< 6
TSS (lbs/day) Raw Sewage Influent Ave. Monthly	188	219	147	186	117	112	124	115	203	149	155	120
TSS (lbs/day) Raw Sewage Influent Daily Maximum	335	286	221	229	155	136	148	170	263	170	189	211
TSS (lbs/day) Weekly Average	23	31	9	5	4	16	15	18	4	9	6	11

TSS (mg/L) Average Monthly	26.4	36	13.8	< 5.1	< 6.3	16	20.5	< 11.9	< 5.7	< 9	< 9	< 13.2
TSS (mg/L) Raw Sewage Influent Ave. Monthly	494	479	392	252	243	257	226	201	383	320	286	226
TSS (mg/L) Weekly Average	46	53	20	5.6	10.8	34.8	22.4	30.8	8.4	20.8	12	30
Fecal Coliform (CFU/100 ml) Geometric Mean	181	364	104	35	117	113	107	58	19	14	92	52
Fecal Coliform (CFU/100 ml) Instant. Maximum	2000	3500	1300	85	236	208	261	209	32	32	233	132
Nitrate-Nitrite (mg/L) Average Monthly	48.3	34.6	29.2	16.7	26.4	30.4	24.1	15.1	33.9	28.9	28.2	31.8
Nitrate-Nitrite (lbs) Total Monthly	509	567	493	459	246	432	376	295	369	394	423	593
Total Nitrogen (mg/L) Average Monthly	51.1	37.5	30.2	17.4	27.7	31.7	25.2	16.3	35.6	< 31.4	29.6	33.2
Total Nitrogen (lbs) Total Monthly	538	615	510	478	259	451	394	319	387	< 428	444	619
Total Nitrogen (lbs) Total Annual			< 4898									
Ammonia (lbs/day) Average Monthly	< 0.05	< 0.07	< 0.04	< 0.07	< 0.05	< 0.05	< 0.07	< 0.06	< 0.05	< 0.05	< 0.05	< 0.05
Ammonia (mg/L) Average Monthly	< 0.13	< 0.15	< 0.11	< 0.1	< 0.11	< 0.11	< 0.12	< 0.1	< 0.1	< 0.11	< 0.1	< 0.1
TKN (mg/L) Average Monthly	2.85	2.9	1.04	0.69	1.31	1.34	1.02	1.16	1.7	< 2.5	1.42	1.44
TKN (lbs) Total Monthly	30	48	18	19	12	19	16	23	19	< 34	21	27
Total Phosphorus (mg/L) Ave. Monthly	3.09	3.54	2.77	2.06	3.39	2.61	2.24	1.1	1.95	1.62	1.85	2.01
Total Phosphorus (lbs) Total Monthly	33	58	47	57	32	37	35	22	21	22	28	37
Total Phosphorus (lbs) Total Annual			391									

Compliance History

3.2 Effluent Violations for Outfall 001, from: August 1, 2019 To: November 30, 2020

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
TSS	8/31/19	Avg Mo	32.6	mg/L	30	mg/L
Fecal Coliform	08/31/19	Geometric Mean	743	CFU/100 ml	200	CFU/100 ml
Fecal Coliform	08/31/19	IMAX	2800	CFU/100 ml	1000	CFU/100 ml
TSS	09/30/19	Wkly Avg	51.2	mg/L	45	mg/L
TSS	10/31/20	Avg Mo	36	mg/L	30	mg/L
TSS	11/30/20	Wkly Avg	46	mg/L	45	mg/L
TSS	10/31/20	Wkly Avg	53	mg/L	45	mg/L
Fecal Coliform	09/30/20	IMAX	1300	CFU/100 ml	1000	CFU/100 ml

3.3 DMR summary

DMR summary for the past 12 months of operation are shown in section 3.1 above. Effluent violations summary from August 1, 2019 to November 30, 2020 shown in section 3.2 indicate there were 5 TSS and 3 Fecal Coliform effluent violations during the period These effluent violations were attributed to solids denitrifying and floating and carried over to the UV chamber. Operator shall endeavor to clean tank regularly to address occurrence of these violations. If these violations continue, the permittee will be required to provide a corrective action plan to address them.

3.4 Inspection Summary

The facility has been inspected several times during last permit cycle. No effluent violations noted during plant inspections. The facility appear to be operated and maintained well.

4.0 Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** .205
Latitude 40º 27' 37.00" **Longitude** -76º 16' 56.00"
Wastewater Description: Sewage Effluent

4.1 Basis for Effluent Limitations

In general, the Clean Water Act(AWA) 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.

4.1.1 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: Water-based limits for CBOD5 are more stringent. Refer to Water Quality-Based Limitations section for detail analysis.

4.2 Water Quality-Based Limitations

4.2.1 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

4.2.2 Receiving Stream

The receiving stream is the Little Swatara Creek. 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-D. It has been assigned stream code 09888. According to eMapPA, Little Swatara Creek is attaining its designated uses.

4.2.3 Stream Flows

The Technical Support Document for Water Quality-Based Toxics Control (TSD) (EPA, 1991) and the Pennsylvania Water

Quality Standards (PA WQS) recommend the flow conditions to use in calculating water quality-based effluent limits (WQBELs) using steady-state modeling. DEP utilizes WQM 7.0 which is a steady state model to calculate WQBELs. The TSD and the PA WQS recommended that WQBELs intended to protect aquatic life uses should be based on the lowest seven-day average flow rate expected to occur once every ten years ($Q_{7\text{-}10}$) for chronic criteria and the lowest one-day average flow rate expected to occur once every ten years ($Q_{1\text{-}10}$) for acute criteria. However, because the chronic criterion for ammonia is a 30-day average concentration not to be exceeded more than once every three years, EPA has used the $Q_{30\text{-}10}$ for the chronic ammonia criterion instead of the $Q_{7\text{-}10}$. The $Q_{30\text{-}10}$ is a biologically- based design flow intended to ensure an excursion frequency of once every three years for a 30-day average flow rate. These flows were determined by correlating with the yield of USGS gauging station No 01573000 on Swatara Creek at Harper Tavern. The $Q_{7\text{-}10}$ and drainage area at the gage is 22.1ft3/s and 337 mi^2 respectively. The resulting yields are as follows:

- $Q_{7\text{-}10}$ = (22.1ft^3/s)/337 mi^2 = 0.0656ft^3/s/ mi^2
- $Q_{30\text{-}10}$ / $Q_{7\text{-}10}$ = 1.40
- $Q_{1\text{-}10}$ / $Q_{7\text{-}10}$ = 0.80

The drainage area at discharge calculated by StreamStats =19.86 mi^2
The $Q_{7\text{-}10}$ at discharge = 19.86 mi^2 x 0.0656 $ft^3/s/mi^2$ = 1.30 ft^3/s.

4.2.4 NH_3-N 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 attached computer model of the stream:

- Discharge pH = 7.1 (DMR median Jul – Sept.)
- Discharge Temperature = 25 ^{o} C (Default)
- Stream pH = 7.0 (Default)
- Stream Temperature = 20 ^{o} C (Default)
- Background NH_3-N = 0.0 (default)

4.2.5 $CBOD_5$ & NH_3-N :

The attached results of the WQM 7.0 stream model indicates that an average monthly limit(AML) of 20.83 mg/l CBOD5 is adequate to protect the water quality of the stream. This is less stringent than the existing limit of 15mg/l and will not be written in the permit due to anti-backsliding restriction. The existing AML of 15mg/l and 22.5mg/l weekly average limit (AWL) and IMAX of 50mg/l will remain in the permit. Past DMRs and inspection reports show that the STP has been consistently complying with the limits. Mass limits are calculated as follows:

Mass based AML (lb/day) = 15 (mg/L) × 0.205(mgd) × 8.34 = 26
Mass based AWL (lb/day) = 22.5(mg/L) × 0.205(mgd) × 8.34 = 39

The attached results of the WQM 7.0 stream model indicates also that a summer limit of 7.39 mg/l NH_3 as a monthly average is necessary to protect the aquatic life from toxicity effects This is less stringent than the existing summer limit of 5 mg/l and will not be written in the permit due to anti-backsliding restrictions. The existing summer limit of 5mg/l and a winter limit of 15mg/l will remain in the permit. Winter limit is 3 times the summer limit. This is consistent with the existing permit and the facility has been complying with it. Mass limits are calculated as follows:

Mass based AML (lb/day) = 5.0 (mg/L) × 0.205(mgd) × 8.34 = 8.5
Mass based AWL (lb/day) = 15(mg/L) × 0.205(mgd) × 8.34 = 25

4.2.6 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 per DEP guidance.

4.2.7 Total Suspended Solids(TSS):

There is no water quality criterion for TSS. A limit of 30 mg/l AML in the existing permit will be continue during this renewal. The limit is 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 limits are calculated as follows:

Mass based AML (lb/day) = 30 (mg/L) × 0.205(mgd) × 8.34 = 51
Mass based AWL (lb/day) = 45(mg/L) × 0.205(mgd) × 8.34 = 76

4.2.8 Toxics

A reasonable potential (RP) was done for pollutants submitted with the application (Total Lead, Total Copper and Total Zinc). Total Lead, Total Copper and Total Zinc were entered into DEP's Toxics Management Spreadsheet(TMS) which combines the existing Toxics Screening Analysis Spreadsheet and PENTOXSD Model to calculate WQBELs. WQBELs recommended by the TMS are presented in attachment C. The results of the TMS indicate discharge levels are well below DEP's target quantitation limit for Total Lead and discharge levels for Total Copper and Total Zinc are well below calculated WQBELs, therefore, no monitoring or limitation was recommended.

The recommended limits follows DEPs SOP No BCW-PMT-037 that recommend establishing limits in a 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.

4.2.9 Total Residual Chlorine:

The discharge does not have any reasonable potential to cause or contribute to a water quality standards violation for total residual chlorine since the permittee utilizes UV instead of chlorine for wastewater disinfection. Therefore, the proposed permit does not contain effluent limits for total residual chlorine. The permittee may use chlorine-based chemicals for cleaning and is required to optimize chlorine usage to prevent negative impacts on receiving stream. Daily UV light intensity monitoring (mW/cm^2) will be required in the permit to ensure efficiency of the UV unit.

4.2.10 Chesapeake Bay Strategy

The Department formulated a watershed implementation plan (WIP) to comply with the wasteload allocation to PA from the TMDL developed by EPA to address Chesapeake Bay pollution. The WIP requires reducing point and non-point source loadings of Total Nitrogen (TN) and Total Phosphorus (TP). Sewage discharges have been prioritized by Central Office 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. These limits may be achieved through a combination of treatment technology, credits, or offsets. Phase 4 (0.2 -0.4mgd) will be required to monitor and report TN and TP monthly during permit renewal and Phase 5(below 0.2mdg) will monitor and report TN and TP once a year. However, any facility in Phases 4 and 5 that undergoes expansion is subjected to cap load right away. This facility falls in phase 4, has been monitoring and will continue monitoring Total Phosphorus and Total Nitrogen series once a month for this permit cycle.

4.2.11 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.

4.2.12 Pretreatment Requirements

The design annual average flow of the treatment plant is 0.205 MGD and the facility does not receive flow from any Industrial or commercial 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 Requirements

5.1 The permit contains the following special conditions:

The permit contains the following special conditions:

Stormwater Prohibition, Approval Contingencies, Proper Waste/Solids Management and Restriction on receipt of hauled in waste under certain conditions

5.2 Stormwater

There is no stormwater outfall associated with this facility.

5.3 Biosolids Management

Sludge is hauled out periodically by a licensed hauler to either Greater Hazleton Joint Sewer Authority or Exeter Township sewage treatment plant for further treatment.

5.4 Anti-backsliding

Not applicable to this permit

5.5 Antidegradation (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.

5.6 Class A Wild Trout Fisheries:

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

5.7 303d listed stream

The discharge is not located on a 303d listed stream segment.

5.8 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).

5.9 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" (362-0400-001), SOPs and/or BPJ.

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	Daily 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 Inst Min	XXX	XXX	9.0	1/day	Grab
Dissolved Oxygen	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	26	39	XXX	15	22.5	30	1/week	24-Hr Composite
Biochemical Oxygen Demand (BOD5) Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Total Suspended Solids	51	76	XXX	30	45	60	1/week	24-Hr Composite
Total Suspended Solids 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
Ultraviolet light intensity (mW/cm^2)	XXX	XXX	Report	XXX	XXX	XXX	1/day	Recorded
Nitrate-Nitrite as N	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/month	24-Hr Composite
Total Nitrogen	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/month	Calculation
Ammonia-Nitrogen Nov 1 - Apr 30	25	XXX	XXX	15.0	XXX	30	1/week	24-Hr Composite
Ammonia-Nitrogen May 1 - Oct 31	8.5	XXX	XXX	5.0	XXX	10	1/week	24-Hr Composite

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

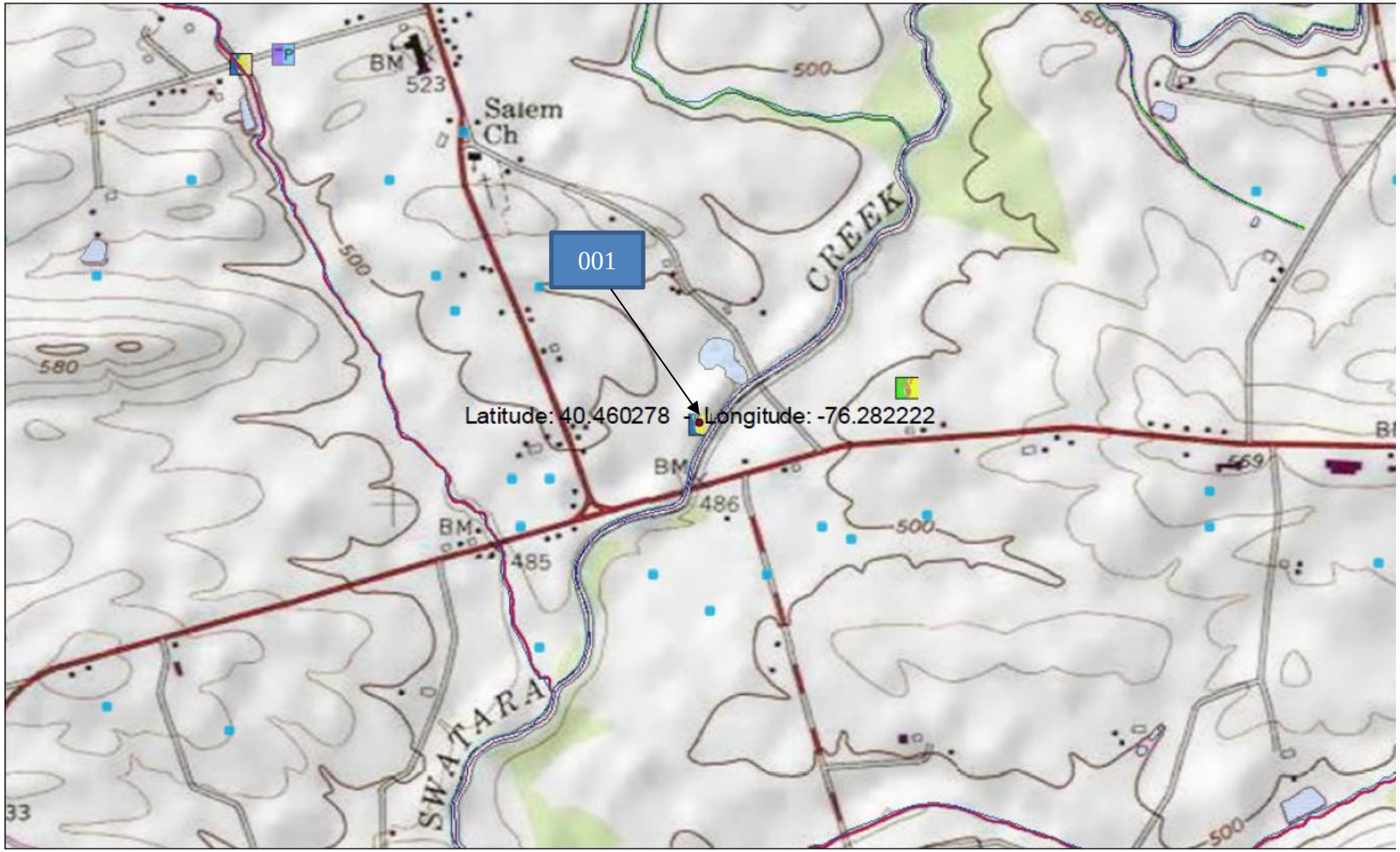
Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Daily Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Total Kjeldahl Nitrogen	XXX	XXX	XXX	XXX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

Compliance Sampling Location: At outfall 001

7.0 Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment)
☐	PENTOXSD for Windows Model (see Attachment)
☐	TRC Model Spreadsheet (see Attachment)
☐	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, 362-0400-001, 10/97.
☐	Policy for Permitting Surface Water Diversions, 362-2000-003, 3/98.
☐	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 362-2000-008, 11/96.
☐	Technology-Based Control Requirements for Water Treatment Plant Wastes, 362-2183-003, 10/97.
☒	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 362-2183-004, 12/97.
☐	Pennsylvania CSO Policy, 385-2000-011, 9/08.
☐	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
☐	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 391-2000-002, 4/97.
☒	Determining Water Quality-Based Effluent Limits, 391-2000-003, 12/97.
☐	Implementation Guidance Design Conditions, 391-2000-006, 9/97.
☒	Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 391-2000-007, 6/2004.
☐	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 391-2000-008, 10/1997.
☐	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 391-2000-010, 3/99.
☐	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 391-2000-011, 5/2004.
☒	Implementation Guidance for Section 93.7 Ammonia Criteria, 391-2000-013, 11/97.
☐	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 391-2000-014, 4/2008.
☐	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 391-2000-015, 11/1994.
☐	Implementation Guidance for Temperature Criteria, 391-2000-017, 4/09.
☐	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 391-2000-018, 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, 391-2000-019, 10/97.
☐	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 391-2000-021, 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, 391-2000-022, 3/1999.
☒	Design Stream Flows, 391-2000-023, 9/98.
☐	Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 391-2000-024, 10/98.
☐	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 391-3200-013, 6/97.
☒	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
☐	Other:
☐	Other:

8.0 Attachments

A. Topographical Map



B. WQM Model Results

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
07D	9888	LITTLE SWATARA CREEK

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)
16.570	Bethel Vill STP	PA0248037	0.205	CBOD5	20.83		
				NH3-N	7.39	14.78	
				Dissolved Oxygen			5

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Permit No. PA0248037

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
07D	9888	LITTLE SWATARA CREEK	**16.570**	486.00	19.86	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	0.066	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.00	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
Bethel Vill STP	PA0248037	0.2050	0.2050	0.2050	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

Permit No. PA0248037

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
07D	9888	LITTLE SWATARA CREEK	**12.060**	460.00	38.01	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	0.066	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.00	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
Frystown STP	PA0247910	0.0724	0.0724	0.0724	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

Permit No. PA0248037

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
07D	9888	LITTLE SWATARA CREEK

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												
16.570	1.30	0.00	1.30	.3171	0.00109	.587	21.94	37.35	0.13	2.193	20.98	7.02
Q1-10 Flow												
16.570	1.04	0.00	1.04	.3171	0.00109	NA	NA	NA	0.11	2.419	21.17	7.02
Q30-10 Flow												
16.570	1.82	0.00	1.82	.3171	0.00109	NA	NA	NA	0.15	1.876	20.74	7.01

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Permit No. PA0248037

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	0.8	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.4	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	5		

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Permit No. PA0248037

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
07D	9888	LITTLE SWATARA CREEK

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
16.570	Bethel Vill STP	8.76	37.54	8.76	37.54	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
16.570	Bethel Vill STP	1.8	12.17	1.8	12.17	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)		
16.57	Bethel Vill STP	20.83	20.83	7.39	7.39	5	5	0	0

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Permit No. PA0248037

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
07D	9888	LITTLE SWATARA CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
16.570	0.205	20.979	7.018
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
21.939	0.587	37.348	0.126
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
5.69	0.456	1.45	0.755
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.608	1.335	Tsivoglou	5
Reach Travel Time (days)			
2.193			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.219	5.12	1.23	6.36
0.439	4.61	1.04	5.63
0.658	4.16	0.88	5.26
0.877	3.74	0.75	5.14
1.096	3.37	0.63	5.19
1.316	3.04	0.54	5.34
1.535	2.74	0.45	5.55
1.754	2.46	0.39	5.80
1.973	2.22	0.33	6.06
2.193	2.00	0.28	6.32

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C. Toxics Management Spreadsheet(TMS)

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.1, October 2020

Model Results

Bethel Village STP, NPDES Permit No. PA0248037, Outfall 001

Instructions | Results | RETURN TO INPUTS | SAVE AS PDF | PRINT | ◉ All ○ Inputs ○ Results ○ Limits

☐ *Hydrodynamics*

☑ *Wasteload Allocations*

☑ *AFC* CCT (min): 15 PMF: 0.722 Analysis Hardness (mg/l): 100 Analysis pH: 7.02

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 Copper	0	0		0	13.439	14.0	55.7	Chem Translator of 0.96 applied
Total Lead	0	0		0	64.581	81.6	325	Chem Translator of 0.791 applied
Total Zinc	0	0		0	117.180	120	477	Chem Translator of 0.978 applied

☑ *CFC* CCT (min): 28.813 PMF: 1 Analysis Hardness (mg/l): 100 Analysis pH: 7.02

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 Copper	0	0		0	8.956	9.33	47.9	Chem Translator of 0.96 applied
Total Lead	0	0		0	2.517	3.18	16.3	Chem Translator of 0.791 applied
Total Zinc	0	0		0	118.139	120	615	Chem Translator of 0.986 applied

☑ *THH* CCT (min): 28.813 PMF: 1 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 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): 12.780 PMF: 1 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 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	

Model Results 1/11/2021 Page 1

☑ ***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 Copper	35.7	µg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	N/A	N/A	Discharge Conc < TQL
Total Zinc	306	µg/L	Discharge Conc ≤ 10% WQBEL