Pennsylvania Department of Environmental Protection

Southcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0247910**
Facility Type	**Municipal**	APS ID	**562641**
Major / Minor	**Minor**	Authorization ID	**1482234**

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Bethel Township Municipal Authority Berks County**	Facility Name	**Bethel Township Frystown STP**
Applicant Address	60 Klahr Road	Facility Address	1711 Camp Swatara Road
	Bethel, PA 19507-9652		Myerstown, PA 17067-1904
Applicant Contact	Jacob Meyer	Facility Contact	Douglas Kopp
Applicant Phone	(717) 933-8813	Facility Phone	(484) 525-4553
Client ID	243378	Site ID	660904
Ch 94 Load Status	Not Overloaded	Municipality	Bethel Township
Connection Status	No Limitations	County	Berks
Date Application Received	April 25, 2024	EPA Waived?	No
Date Application Accepted	May 9, 2024	If No, Reason	DEP Discretion
Purpose of Application	NPDES permit renewal.		

Summary of Review

ARRO Consulting, Inc., on behalf of the Bethel Township Frystown (Authority/Permittee), applied to the Pennsylvania Department of Environmental Protection (DEP) for issuance of the NPDES permit. The permit was reissued on July 25, 2019, and became effective on August 1, 2019. The permit expires on July 31, 2024. but the terms and conditions of the permit have been extended since that time.

Bethel Township Municipal Authority owns and operates the Bethel Township Frystown sanitary wastewater treatment facility located in Bethel Township, Berks County. The facility serves only the Village of Frystown, all wastes are residential in nature, and all sewer systems are 100% separated.

The permit PA0247910 major amendment was issued on 5/24/2021 to increase the annual average design flow and hydraulic design capacity from 0.0767 MGD to 0.113 MGD. The Organic design capacity changed from 145 lbs BOD_5/day to 235 lbs BOD_5/day.

WQM Part II No. 0606402 was issued on 8/29/2006, and 0606402 A-1 amendment was issued 5/24/2021. WQM No. 0616403 was issued on 10/06/2016.

Sludge use and disposal description and location(s): N/A because sludge is hauled by the facility's contractor.

Changes from the previous permit: The E. Coli monitoring and report requirements will add to the proposed permit.

Based on the review outlined in this fact sheet, it is recommended that the permit be drafted. A public notice of the draft permit will be published in the *Pennsylvania Bulletin* for public comments for 30 days.

Approve	Deny	Signatures	Date
X		*Hilaryle* Hilary H. Le / Environmental Engineering Specialist	January 29, 2025
X		Maria D. Bebenek for Daniel W. Martin, P.E. / Environmental Engineer Manager	February 6, 2025

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	001	Design Flow (MGD)	0.113
Latitude	40º 26' 39.0"	Longitude	-76º 19' 51.0"
Quad Name	Bethel	Quad Code	
Wastewater Description:	Sewage Effluent		
Receiving Waters	Little Swatara Creek (CWF, MF)	Stream Code	09888
NHD Com ID	56395743	RMI	12.4
Drainage Area	37.9 sq.mi.	Yield (cfs/mi^2)	0.05
Q_{7-10} Flow (cfs)	1.86	Q_{7-10} Basis	USGS StreamStats
Elevation (ft)	450	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	
Nearest Downstream Public Water Supply Intake	PA American Water Company		
PWS Waters	Swatara Creek	Flow at Intake (cfs)	
PWS RMI	16.4 miles	Distance from Outfall (mi)	Approximate 35.0 miles

Drainage Area
The discharge is to Little Swatara Creek at RMI 12.4 mile. A drainage area upstream of the discharge is estimated to be 37.9 mi.^{2}, according to USGS PA StreamStats available at https://streamstats.usgs.gov/ss/.

Stream Flow
According to USGS StreamStats, the discharge point has a Q_{7-10} of 1.86 cfs and a drainage area of 37.9 mi.^{2}, which results in a Q_{7-10} low flow yield of 0.05 cfs/mi.^{2}. This information is used to obtain a chronic or 30-day (Q_{30-10}), and an acute or 1-day (Q_{1-10}) exposure stream flow for the discharge point as follows (Guidance No. 391-2000-023):

Q_{7-10} = 1.86 cfs
Low Flow Yield = 1.86 cfs / 37.9 mi.^{2} ≈ 0.05 cfs/mi.^{2}
Q_{30-10} = 1.36 * 1.86 cfs ≈ 2.53 cfs
Q_{1-10} = 0.64 * 1.86 cfs ≈ 1.19 cfs

The resulting Q_{7-10} dilution ratio is: Q_{stream} / $Q_{discharge}$ = 1.86 cfs / [0.113 MGD * (1.55 cfs/MGD)] = 10.6:1

Little Swatara Creek
25 Pa Code 93.9o classifies Little Swatara Creek as cold-water fishes (CWF) surface water. Based on the 2024 Integrated Report, Little Swatara Creek, is not impaired. A TMDL currently does not exist for this stream segment, therefore, no TMDL has been taken into consideration during this review.

Public Water Supply
The nearest downstream public water supply intake is the Pennsylvania American Water Company on the Swatara Creek, approximately 35.0 miles downstream of this discharge. Considering distance and dilution, the discharge is not expected to impact the water supply.

Class A Wild Trout Streams
The receiving stream is not a Class A Wild Trout stream; therefore, no Class A Wild Trout Fishery is impacted by this discharge.

Treatment Facility Summary				

Treatment Facility Name: Frystown System

WQM Permit No.	Issuance Date
0606402	8/29/2006
0616403	10/06/2016
0606402 A-1	5/24/2021

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Tertiary	Extended Aeration With Solids Removal	Ultraviolet	0.113

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.113	235	Not Overloaded	Aerobic Digestion	Combination of methods

Changes Since Last Permit Issuance:

Other Comments:

The WWTP consists of a comminutor, two lift pumps, a mechanical fine screen, an EQ tank, three anoxic tanks, three aeration tanks, three clarifiers, a UV disinfection system, a post-aeration chamber and the outfall.

Soda ash (pH adjustment) and Poly Aluminum Chloride (phosphorus precipitation) are both utilized at the facility.

Solids are hauled offsite for disposal.

Compliance History	
Summary of DMRs:	DMRs reported last 12 months in the next page.
Summary of Inspections:	12/07/2022: Heather Dock & Adam Aponte, DEP WQSs, conducted compliance evaluation inspection. Effluent was clear. The field test results were within permitted limits. There were no violations noted during inspection. Recommendations were: 1. maintain a NIST- traceable thermometer in composite sampler to ensure samples are properly preserved in an environment of 4 – 6 C. 2. Set up influent composite sampler to collect sample aliquots of at least 100 mL. 3. Locate discharge pipe to the stream. 4. Replace D.O. cap and i-button on site's D.O. meter.
Other Comments:	There are no open violations associated with this facility or permittee.

Other Comments:

Compliance History

DMR Data for Outfall 001 (from December 1, 2023 to November 30, 2024)

Parameter	NOV-24	OCT-24	SEP-24	AUG-24	JUL-24	JUN-24	MAY-24	APR-24	MAR-24	FEB-24	JAN-24	DEC-23
Flow (MGD) Average Monthly	0.0264	0.0321	0.0338	0.0362	0.0346	0.0345	0.0349	0.0451	0.0419	0.0416	0.0449	0.043
Flow (MGD) Daily Maximum	0.0393	0.0511	0.0599	0.0869	0.0546	0.0586	0.0577	0.1255	0.0923	0.0632	0.0984	0.1174
pH (S.U.) Instantaneous Minimum	6.98	6.97	7.13	7.17	6.96	7.12	7.15	7.17	6.95	6.95	6.95	7.04
pH (S.U.) Instantaneous Maximum	7.81	7.84	7.81	8.01	7.95	8.44	8.0	7.77	7.72	7.75	7.97	7.79
DO (mg/L) Instantaneous Minimum	6.19	5.81	6.42	6.75	6.14	6.91	6.42	7.63	7.9	9.39	9.64	9.38
CBOD5 (lbs/day) Average Monthly	< 0.5	0.5	< 0.6	0.7	< 0.6	0.8	< 0.7	< 4	0.6	1	0.9	0.7
CBOD5 (lbs/day) Weekly Average	0.7	0.6	1	0.8	< 0.7	9.0	1	7	0.8	1	1	0.8
CBOD5 (mg/L) Average Monthly	< 3.0	2.3	< 2.4	2.5	< 2.2	3.1	< 2.4	< 4.5	2.5	2.9	2.7	4.1
CBOD5 (mg/L) Weekly Average	5.0	3.0	3.0	3.0	3.0	3.0	3.0	7.0	3.0	3.0	3.0	5.0
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	90	60	45	64	50	45	55	65	60	47	65	35
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	171	98	70	98	77	54	84	75	61	51	77	41
BOD5 (mg/L) Raw Sewage Influent Average Monthly	457	255	190	231	170.1	165	186	129.6	255	140	190	211
TSS (lbs/day) Average Monthly	< 0.9	< 1	< 1	< 1	< 1	2.0	1	22	2	5	4	2
TSS (lbs/day) Raw Sewage Influent Average Monthly	48	56	69	88	73	66	86	119	78	74	78	37
TSS (lbs/day) Raw Sewage Influent Daily Maximum	75	100	109	121	97	96	137	136	80	86	84	51

TSS (lbs/day) Weekly Average	< 1	2	3	2	2	3.0	2	42	3	5	5	3
TSS (mg/L) Average Monthly	< 5.0	< 6.0	< 6.0	< 4.0	< 5.0	8.0	5.0	22.3	8.7	14.4	11.6	11.6
TSS (mg/L) Raw Sewage Influent Average Monthly	247	234.5	306.2	324	251	257.8	290	242	330	218	231	211
TSS (mg/L) Weekly Average	5.0	9.0	9.0	6.0	7.0	11.0	6.0	41.0	9.0	14.0	15.0	12.0
Fecal Coliform (No./100 ml) Geometric Mean	3	7	6	6	11	< 4	5	< 3	1	16	< 1	< 13
Fecal Coliform (No./100 ml) Instantaneous Maximum	8	16	8	20	32	20	17	12	1	33	< 1	164
UV Intensity (mW/cm²) Instantaneous Minimum	4.7	2.6	5.6	3.1	2.1	3.9	4.7	4.5	4	3	3	3.1
Nitrate-Nitrite (mg/L) Average Monthly	24.6	21.6	16.5	17.6	16.9	16.1	21	19.1	23.2	20.7	21.3	21
Nitrate-Nitrite (lbs) Total Monthly	151	152	110	149	154	132	186	354	179	203	223	105
Total Nitrogen (mg/L) Average Monthly	< 25.5	< 22.7	< 17.3	18.4	< 17.78	< 17	< 21.8	21.2	24.4	21.8	22.2	21.7
Total Nitrogen (lbs) Effluent Net Total Monthly	< 156	< 160	< 116	156	< 162	< 139	< 194	406	188	214	232	110
Total Nitrogen (lbs) Total Monthly	< 156	< 160	< 116	156	< 162	< 139	< 194	406	188	214	232	110
Total Nitrogen (lbs) Effluent Net Total Annual			< 20.09									
Total Nitrogen (lbs) Total Annual			< 7.5									
Ammonia (lbs/day) Average Monthly	< 0.02	< 0.02	< 0.02	< 0.03	< 0.03	< 0.03	< 0.03	< 0.07	< 0.03	< 0.03	< 0.03	< 0.02
Ammonia (mg/L) Average Monthly	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.11	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Ammonia (lbs) Total Monthly	< 0.6	< 0.7	< 0.7	< 0.8	< 0.9	< 0.8	< 1	< 2	< 0.8	< 1	< 1	< 0.5
Ammonia (lbs) Total Annual			< 0.04									
TKN (mg/L) Average Monthly	< 0.89	< 1.12	< 0.83	0.84	< 0.89	< 0.85	< 0.83	2.15	1.16	1.09	0.91	< 1.03

TKN (lbs) Total Monthly	< 5	< 8	< 6	7	< 8	< 0.2	< 7	52	9	11	10	< 6
Total Phosphorus (lbs/day) Average Monthly	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.7	0.2	0.2	0.2	0.1
Total Phosphorus (mg/L) Average Monthly	1	1.43	0.88	0.66	0.67	0.91	0.68	0.91	0.71	0.72	0.54	0.6
Total Phosphorus (lbs) Effluent Net Total Monthly	5	10	6	6	6	7	6	21	6	7	6	3
Total Phosphorus (lbs) Total Monthly	5	10	6	6	6	7	6	21	6	7	6	3
Total Phosphorus (lbs) Effluent Net Total Annual			0.73									
Total Phosphorus (lbs) Total Annual			0.3									

Existing Effluent Limitations and Monitoring Requirements

Outfall 001,

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Instantaneous 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	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
UV Intensity (mW/cm²)	XXX	XXX	Report	XXX	XXX	XXX	1/day	Metered
CBOD5	24	**38**	XXX	25.0	40.0	50	1/week	24-Hr Composite
BOD5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	24-Hr Composite
TSS	28	42	XXX	30.0	45.0	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
Ammonia-Nitrogen	Report	XXX	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Total Phosphorus	Report	XXX	XXX	Report	XXX	XXX	1/week	24-Hr Composite

Outfall 001, Pennsylvania's Chesapeake Bay

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Monthly	Annual	Monthly	Monthly Average	Maximum	Instant. Maximum		
Ammonia--N	Report	Report	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Kjeldahl--N	Report	XXX	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Nitrate-Nitrite as N	Report	XXX	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Total Nitrogen	Report	Report	XXX	Report	XXX	XXX	1/month	Calculation
Total Phosphorus	Report	Report	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Net Total Nitrogen	Report	8,045	XXX	XXX	XXX	XXX	1/month	Calculation
Net Total Phosphorus	Report	188	XXX	XXX	XXX	XXX	1/month	Calculation

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.113
Latitude 40º 26' 39.00" **Longitude** -76º 19' 51.00"
Wastewater Description: Sewage Effluent

Technology-Based Limitations

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

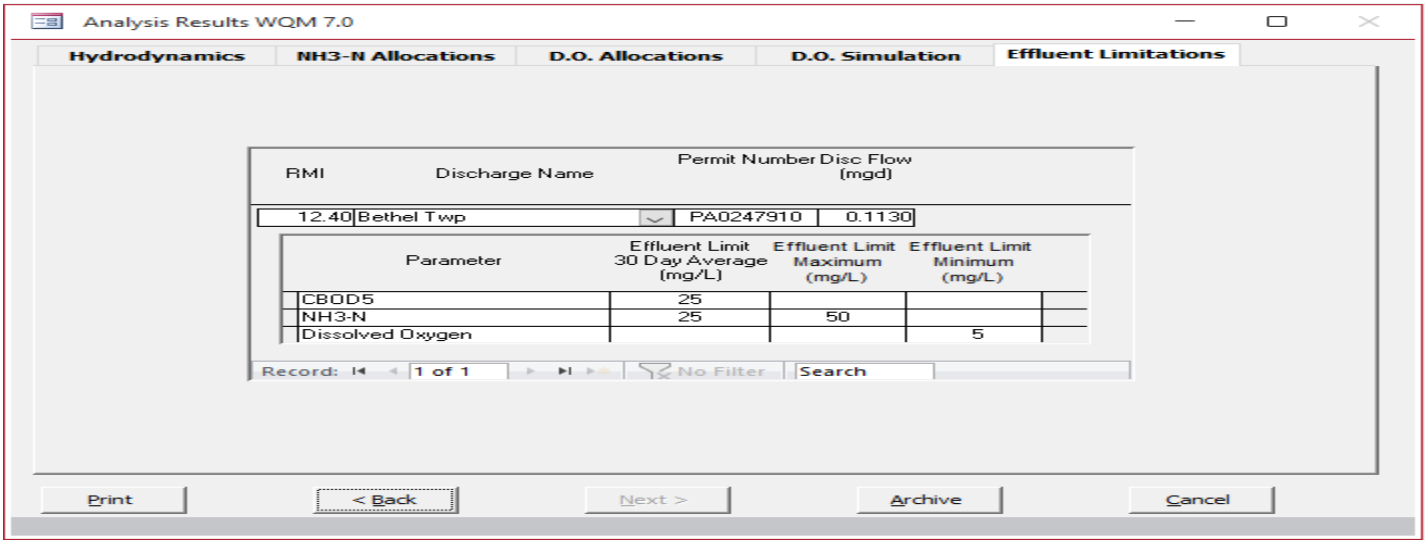
Pollutant	Limit (mg/l)	SBC	Federal Regulation	State Regulation
$CBOD_5$	25	Average Monthly	133.102(a)(4)(i)	92a.47(a)(1)
	40	Average Weekly	133.102(a)(4)(ii)	92a.47(a)(2)
Total Suspended Solids	30	Average Monthly	133.102(b)(1)	92a.47(a)(1)
	45	Average Weekly	133.102(b)(2)	92a.47(a)(2)
pH	6.0 – 9.0 S.U.	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: The Total Residual Chlorine is not applicable because the facility uses UV for disinfection.

Water Quality-Based Limitations

Ammonia (NH_3-N):
NH_3-N calculations are 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 in-stream NH_3-N criteria used in the attached WQM 7.0 computer model of the stream:

- Discharge pH = 7.0 (Default)
- Discharge Temperature = 25°C (Default)
- Stream pH = 7.0 (Default)
- Stream Temperature = 20ºC (Default)
- Background NH_3-N = 0 mg/L (Default)



Regarding NH_3-N limits, the attached computer printout of the WQM 7.0 stream model (version 1.1) indicates that a limit of 25.0 mg/L as a monthly average is necessary to protect the aquatic life from toxicity effects at the point of discharge. Therefore, the existing summer & winter monitoring and report concentration & mass average monthly will remain in the proposed permit.

Dissolved Oxygen (D.O.):
The minimum D.O. of 5.0 mg/L is required per 25 Pa. Code § 93.7. It is recommended that this limit be maintained in the proposed permit to ensure the protection of water quality standards.

Carbonaceous Biochemical Oxygen Demand ($CBOD_5$):
The attached computer printout of the WQM 7.0 stream model (ver. 1.1) indicates that a monthly average limit of 25.0 mg/L, or secondary treatment, is adequate to protect the water quality of the stream. Therefore, the existing summer permit 25.0 mg/L as AML, 40.0 mg/L as weekly average limit (AWL), & 50.0 mg/L as IMAX will remain in the proposed permit. Recent DMRs and inspection reports show that the facility has typically been achieving concentrations below this limit. Mass limits are calculated as follows:

Summer Average monthly mass limit: 25.0 mg/L x 0.113 MGD x 8.34 = 23.56 (24.0) lbs/day
Summer Average weekly mass limit: 40.0 mg/L x 0.113 MGD x 8.34 = 37.7 (38.0) lbs/day

These values are rounded down to 24.0 lbs/day and 38.0 lbs/day, respectively. The minimum monitoring frequency will remain the same as 1/week.

pH:
The effluent discharge pH should remain above 6.0 and below 9.0 standard units according to 25 Pa. Code § 95.2(1).

Total Suspended Solids (TSS):
The existing technology-based limits of 30.0 mg/L average monthly, 45.0 mg/L weekly average, and 60.0 mg/L IMAX will remain in the proposed permit based on the minimum level of effluent quality attainable by secondary treatment based on 25 Pa. Code § 92a.47. Recent DMRs and inspection reports show that the facility has been consistently achieving these limits. Mass limits are calculated as follows:

Average monthly mass limit: 30.0 mg/L x 0.113 MGD x 8.34 = 28.27 (28.0) lbs/day
Average weekly mass limit: 45.0 mg/L x 0.113 MGD x 8.34 = 42.41 (42.0) lbs/day

The average monthly and weekly average mass loadings will be rounded down to 28.0 lbs/day and 42.0 lbs/day, respectively. The minimum monitoring frequency will remain the same as 1/week.

Fecal Coliform:
The recent coliform guidance in 25 Pa. Code § 92a.47.(a)(4) requires a summer technology limit of 200/100 ml as a geometric mean and an instantaneous maximum not greater than 1,000/100ml and § 92a.47.(a)(5) requires a winter limit of 2,000/100ml as a geometric mean and an instantaneous maximum not greater than 10,000/100ml.

E. Coli:
As recommended by DEP's SOP No. BCW-PMT-033, version 2.0 revised February 5, 2024, a routine monitoring for E. Coli will be included in the proposed permit under 25 Pa. Code § 92a.61. This requirement applies to all sewage dischargers greater than 0.002 MGD in their new and reissued permits. A monitoring frequency of 1/quarter will be included in the permit to be consistent with the recommendation from this SOP.

Raw Sewage Influent Monitoring:
As a result of negotiation with EPA, influent monitoring of TSS and BOD_5 are required for any POTWs; therefore, influent sampling of BOD_5 and TSS will remain in the proposed permit. A 24-hr composite sample type will be required to be consistent with the proposed sampling frequency for TSS and BOD_5 in the effluent.

Total Phosphorus:
The existing permit monitoring and report average monthly TP concentration, and mass will remain in the proposed permit.

UV:
The UV system daily monitor and report the UV intensity (mW/cm^2) will remain in the proposed permit.

Chesapeake Bay Strategy:

The Department formulated a strategy to comply with the EPA and Chesapeake Bay Foundation requirements by reducing 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 I, II, and III) dischargers will receive annual loading caps based on their design flow on August 29, 2005 and concentrations of 6.0 mg/L TN and 0.8 mg/L TP. These limits may be achieved through a combination of treatment technology, credits, or offsets. Phase IV (0.2 - 0.4 MGD) will be required to monitor and report TN and TP during permit renewal monthly and Phase V (below 0.2 MGD) will monitor during current permit renewal once a year. However, any facility in Phases IV and V that undergoes expansion is subjected to cap load right away.

This plant is classified as a phase V. For Phase V sewage facilities (average annual design flow on August 29, 2005 > 0.002 MGD and < 0.2 MGD), renewed or amended permits that include an increase in design flow will contain Cap Loads based on the lesser of a) existing TN and TP concentrations at current design average annual flow or b) 7,306 lbs./yr. TN and 974 lbs./yr. TP.

The 8,045 lbs/yr TN and 188 lbs/yr TP will remain in the proposed permit.

Toxic:

DEP's current permit renewal application for minor sewage facilities requires sampling of Total Copper, Total Lead, and Total Zinc for facilities with a design flow greater than or equal to 0.1 MGD. The application indicated there are no industrial or commercial wastewater contributions. Consequently, DEP determined that there is no toxic pollutant of concern for this facility at this time.

Additional Considerations

Flow Monitoring

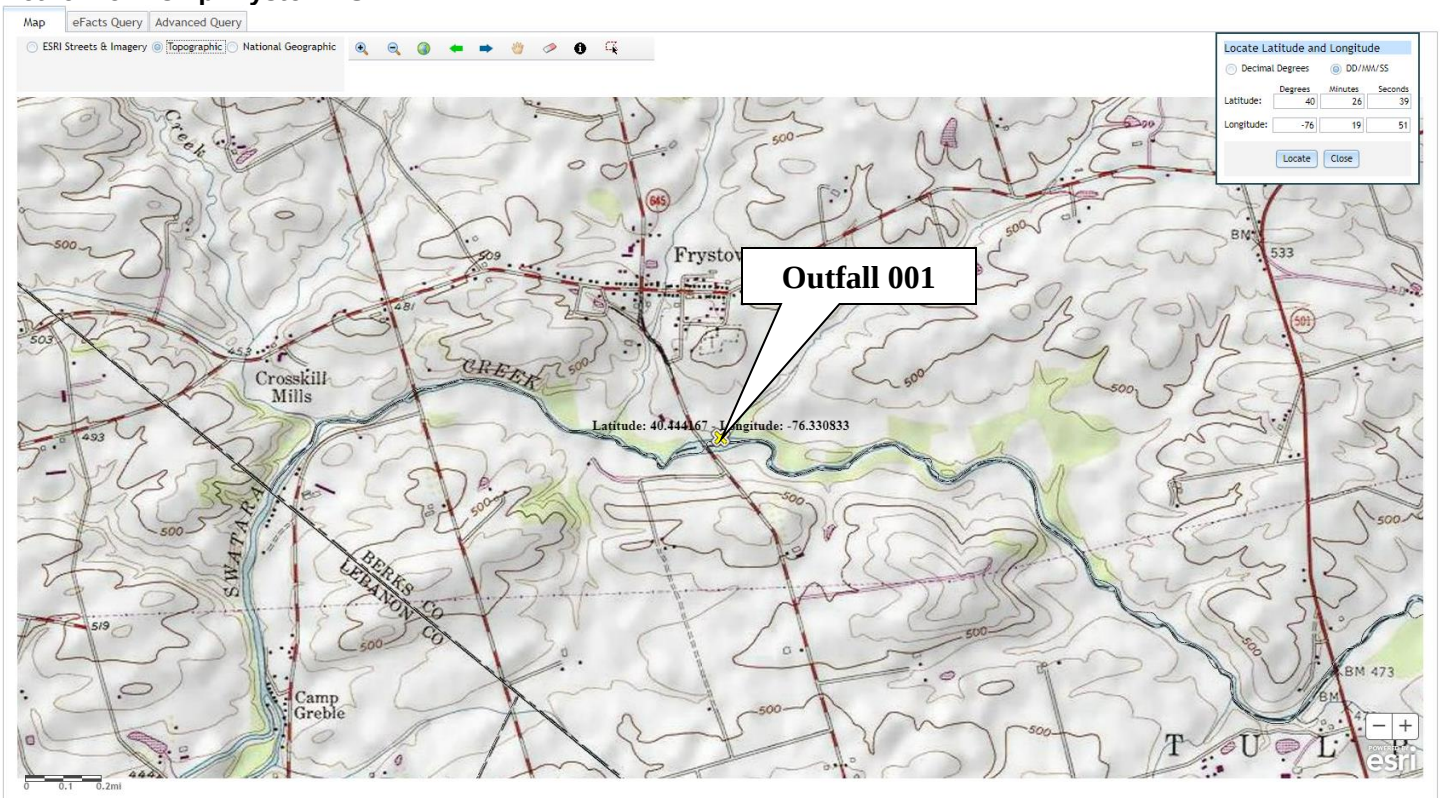
The requirement to monitor the volume of effluent will remain in the draft permit per 40 CFR § 122.44(i)(1)(ii).

Antidegradation Requirements

All effluent limitations and monitoring requirements 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.

Anti-backsliding Requirement

All effluent limits proposed in this fact sheet are as stringent as effluent limits specified in the existing permit renewal. This approach is in accordance with 40 CFR §122.44(l(1).



WQM 7.0:

The following data were used in the attached computer model (WQM 7.0) of the stream:

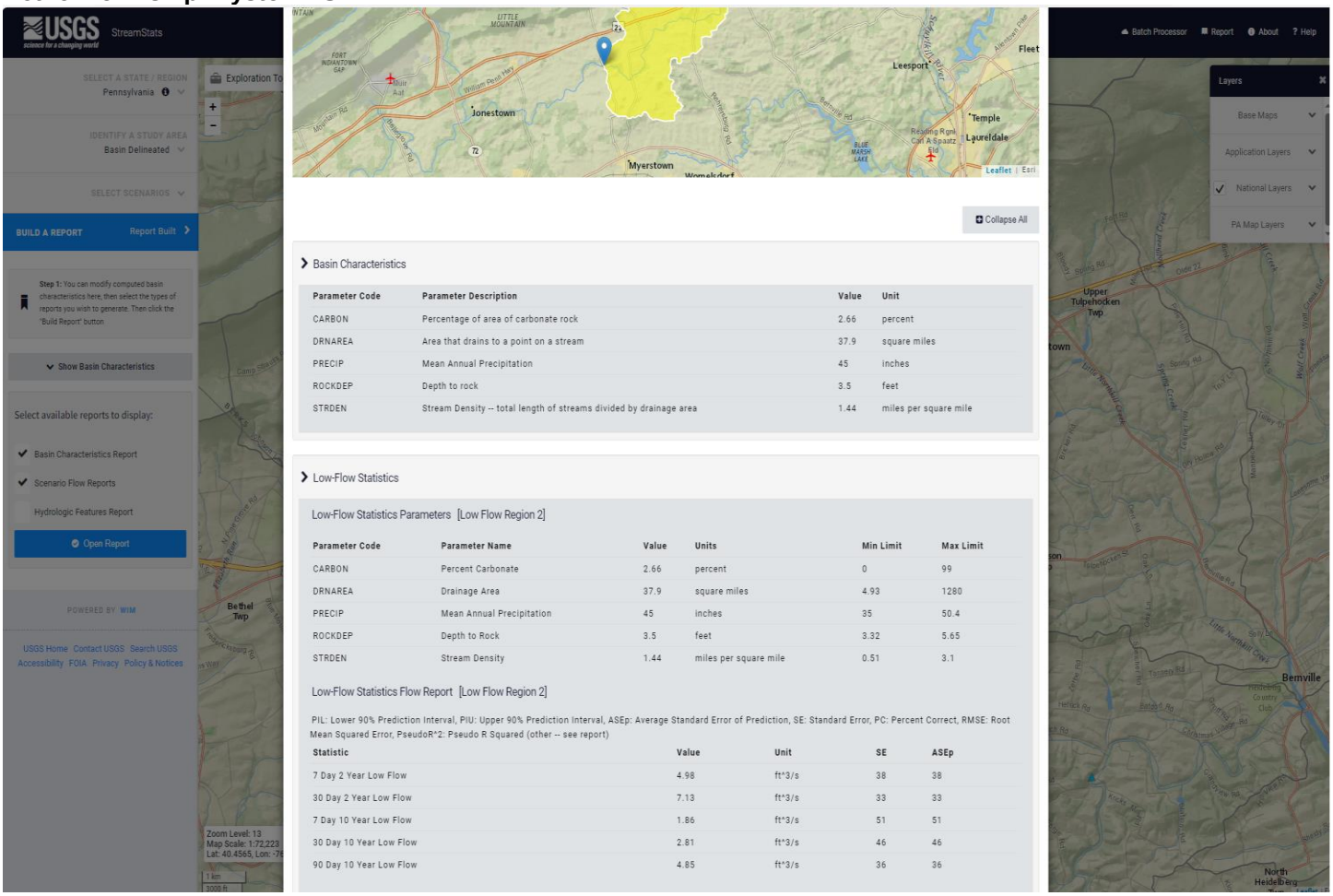
*	Discharge pH	=	7.0	(Default)
*	Discharge Temperature	=	25°C	(Default)
*	Stream pH	=	7.0	(Default)
*	Stream Temperature	=	20°C	(Default)
*	Background NH_3-N	=	0 mg/L	(Default)

Node 1: Outfall 001 Little Swatara Creek (9888)

Elevation:	450.0 ft (USGS National Map Viewer)
Drainage Area:	37.9 mi^2 (USGS PA StreamStats)
River Mile Index:	12.4 (PA DEP eMapPA)
Low Flow Yield:	0.05 cfs/mi^2
Discharge Flow:	0.113 MGD

Node 2: At confluence with Crosskill Creek 9919

Elevation:	435.0 ft (USGS National Map Viewer)
Drainage Area:	40.8 mi^2 (USGS PA StreamStats)
River Mile Index:	11.2 (PA DEP eMapPA)
Low Flow Yield:	0.05 cfs/mi^2
Discharge Flow:	0.0 MGD

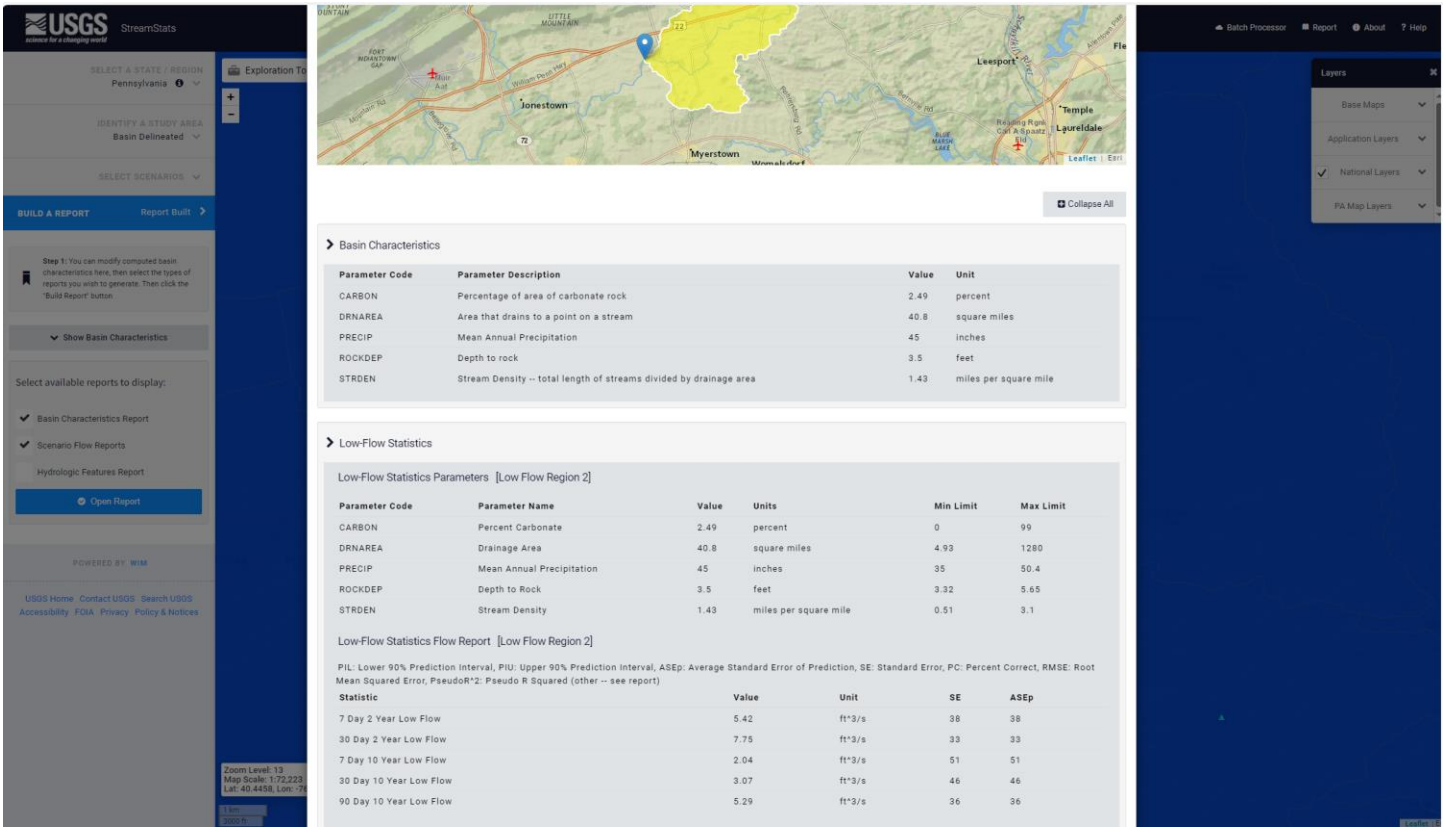


Parameter Code	Parameter Description	Value	Unit
CARBON	Percentage of area of carbonate rock	2.66	percent
DRNAREA	Area that drains to a point on a stream	37.9	square miles
PRECIP	Mean Annual Precipitation	45	inches
ROCKDEP	Depth to rock	3.5	feet
STRDEN	Stream Density -- total length of streams divided by drainage area	1.44	miles per square mile

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
CARBON	Percent Carbonate	2.66	percent	0	99
DRNAREA	Drainage Area	37.9	square miles	4.93	1280
PRECIP	Mean Annual Precipitation	45	inches	35	50.4
ROCKDEP	Depth to Rock	3.5	feet	3.32	5.65
STRDEN	Stream Density	1.44	miles per square mile	0.51	3.1

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	4.98	ft^3/s	38	38
30 Day 2 Year Low Flow	7.13	ft^3/s	33	33
7 Day 10 Year Low Flow	1.86	ft^3/s	51	51
30 Day 10 Year Low Flow	2.81	ft^3/s	46	46
90 Day 10 Year Low Flow	4.85	ft^3/s	36	36

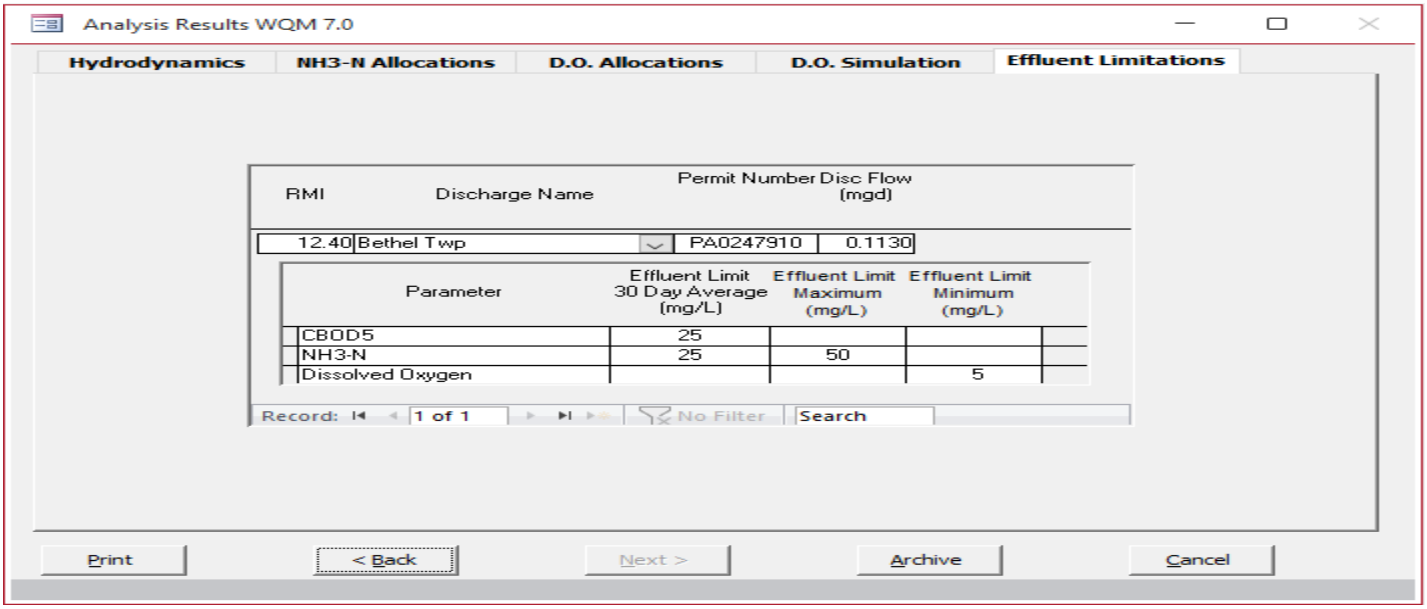


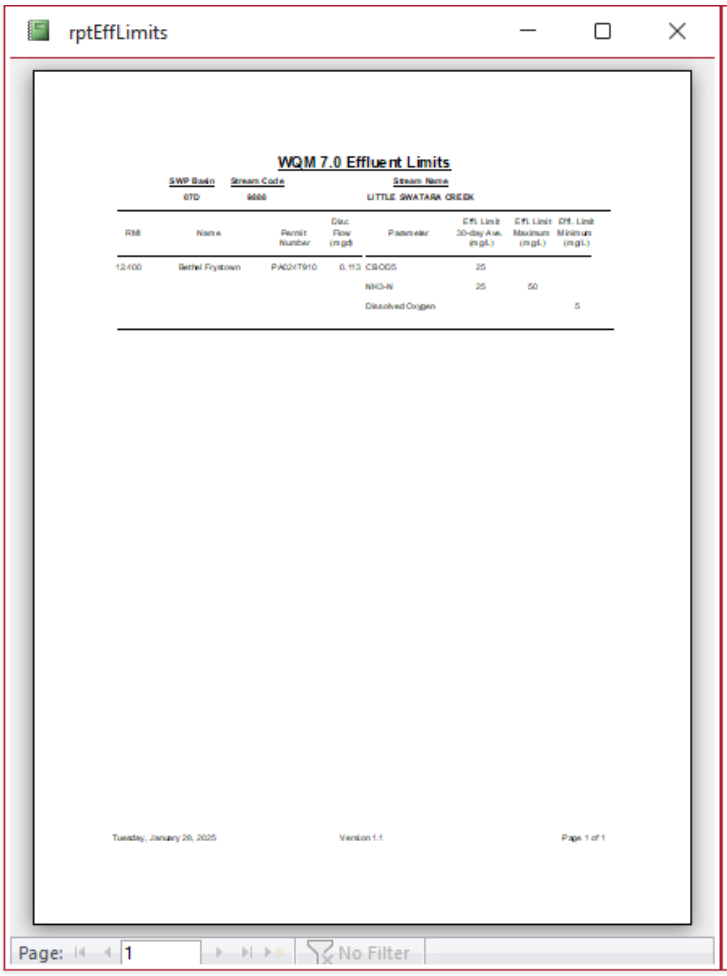
Parameter Code	Parameter Description	Value	Unit
CARBON	Percentage of area of carbonate rock	2.49	percent
DRNAREA	Area that drains to a point on a stream	40.8	square miles
PRECIP	Mean Annual Precipitation	45	inches
ROCKDEP	Depth to rock	3.5	feet
STRDEN	Stream Density -- total length of streams divided by drainage area	1.43	miles per square mile

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
CARBON	Percent Carbonate	2.49	percent	0	99
DRNAREA	Drainage Area	40.8	square miles	4.93	1280
PRECIP	Mean Annual Precipitation	45	inches	35	50.4
ROCKDEP	Depth to Rock	3.5	feet	3.32	5.65
STRDEN	Stream Density	1.43	miles per square mile	0.51	3.1

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	5.42	ft^3/s	38	38
30 Day 2 Year Low Flow	7.75	ft^3/s	33	33
7 Day 10 Year Low Flow	2.04	ft^3/s	51	51
30 Day 10 Year Low Flow	3.07	ft^3/s	46	46
90 Day 10 Year Low Flow	5.29	ft^3/s	36	36


Analysis Results WQM 7.0
Hydrodynamics
NH3-N Allocations
D.O. Allocations
D.O. Simulation
Effluent Limitations
RMI
Discharge Name
Permit Number
Disc Flow (mgd)
12.40
Bethel Twp
PA0247910
0.1130
Parameter
Effluent Limit 30 Day Average (mg/L)
Effluent Limit Maximum (mg/L)
Effluent Limit Minimum (mg/L)
CBOD5
25
NH3-N
25
50
Dissolved Oxygen
5
Record: 1 of 1
No Filter
Search
Print
< Back
Next >
Archive
Cancel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WQM 7.0 Effluent Limits
SWP Basin
Stream Code
Stream Name
07D
9999
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)
12.400
Bethel Frystown
PA0247910
0.113
CBOD5
25
NH3-N
25
50
Dissolved Oxygen
5
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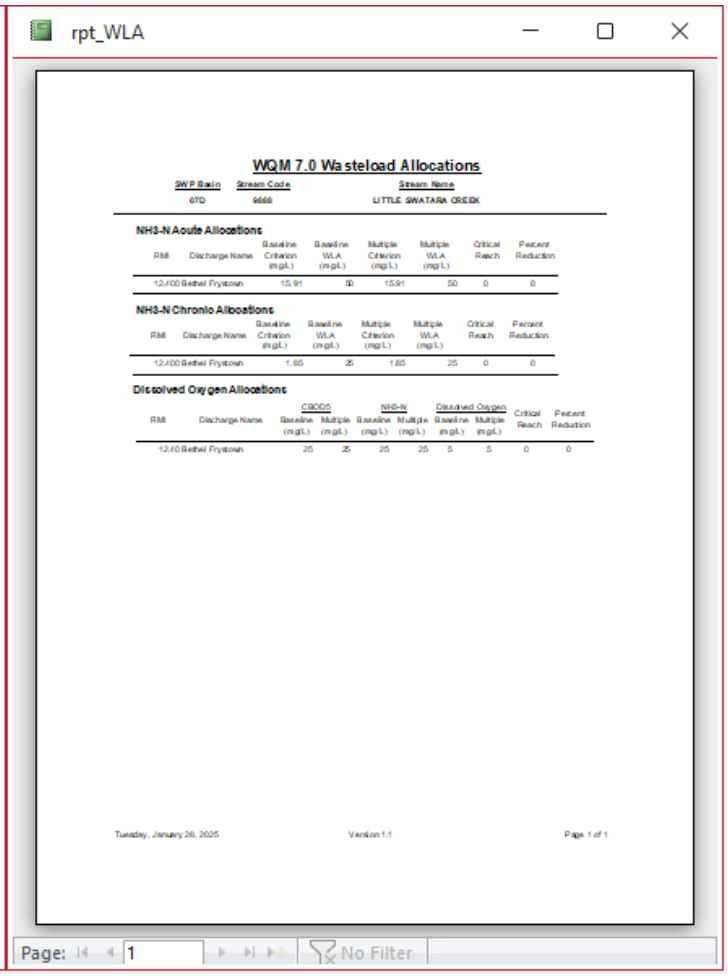
rpt_WLA
WQM 7.0 Wasteload Allocations
SWP Basin
Stream Code
Stream Name
07D
9999
LITTLE SWATARA CREEK
NH3-N Acute Allocations
RMI
Discharge Name
Baseline Criterion (mg/L)
Baseline WLA (mg/L)
Multiple Criterion (mg/L)
Multiple WLA (mg/L)
Critical Reach
Percent Reduction
12.400 Bethel Frystown
15.91
50
15.91
50
0
0
NH3-N Chronic Allocations
12.400 Bethel Frystown
1.65
25
1.65
25
0
0
Dissolved Oxygen Allocations
CBOD5
NH3-N
Dissolved Oxygen
12.40 Bethel Frystown
25
25
25
25
5
5
0
0
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rptDOSim

WQM 7.0 D.O. Simulation

SWP Basin	Stream Code	Stream Name
07D	9000	LITTLE SWATARA CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
12.400	0.113	20.422	7.000
Reach Width (ft)	Reach Depth (ft)	Reach W/D Ratio	Reach Velocity (fps)
25.379	0.611	41.506	0.133
Reach CBOD5 (mg/L)	Reach Kc (1/days)	Reach NH3-N (mg/L)	Reach Kn (1/days)
3.94	0.646	2.11	0.723
Reach DO (mg/L)	Reach Kr (1/days)	Kr Equation	Reach DO Goal (mg/L)
7.909	3.031	Tsivoglou	5
Reach Travel Time (days)			
0.550			

Subreach Results			
TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.055	3.80	2.03	7.60
0.110	3.67	1.95	7.31
0.165	3.54	1.87	7.08
0.220	3.41	1.80	6.91
0.275	3.29	1.73	6.78
0.330	3.17	1.66	6.69
0.385	3.06	1.60	6.63
0.440	2.95	1.54	6.59
0.495	2.84	1.48	6.58
0.550	2.74	1.42	6.58

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rptModelSpecs

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	0.64	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.26	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	5		

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rptHydro

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
07D	9000	LITTLE SWATARA CREEK

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Dis. 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												
12.400	1.90	0.00	1.90	.1748	0.00237	.611	25.38	41.51	0.13	0.550	20.42	7.00
Q1-10 Flow												
12.400	1.21	0.00	1.21	.1748	0.00237	NA	NA	NA	0.11	0.668	20.63	7.00
Q30-10 Flow												
12.400	2.58	0.00	2.58	.1748	0.00237	NA	NA	NA	0.16	0.469	20.32	7.00

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rptGeneral

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	9000	LITTLE SWATARA CREEK	12.400	450.00	37.90	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	W/D Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.050	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 Frystown	PA0247910	0.1130	0.1130	0.1130	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

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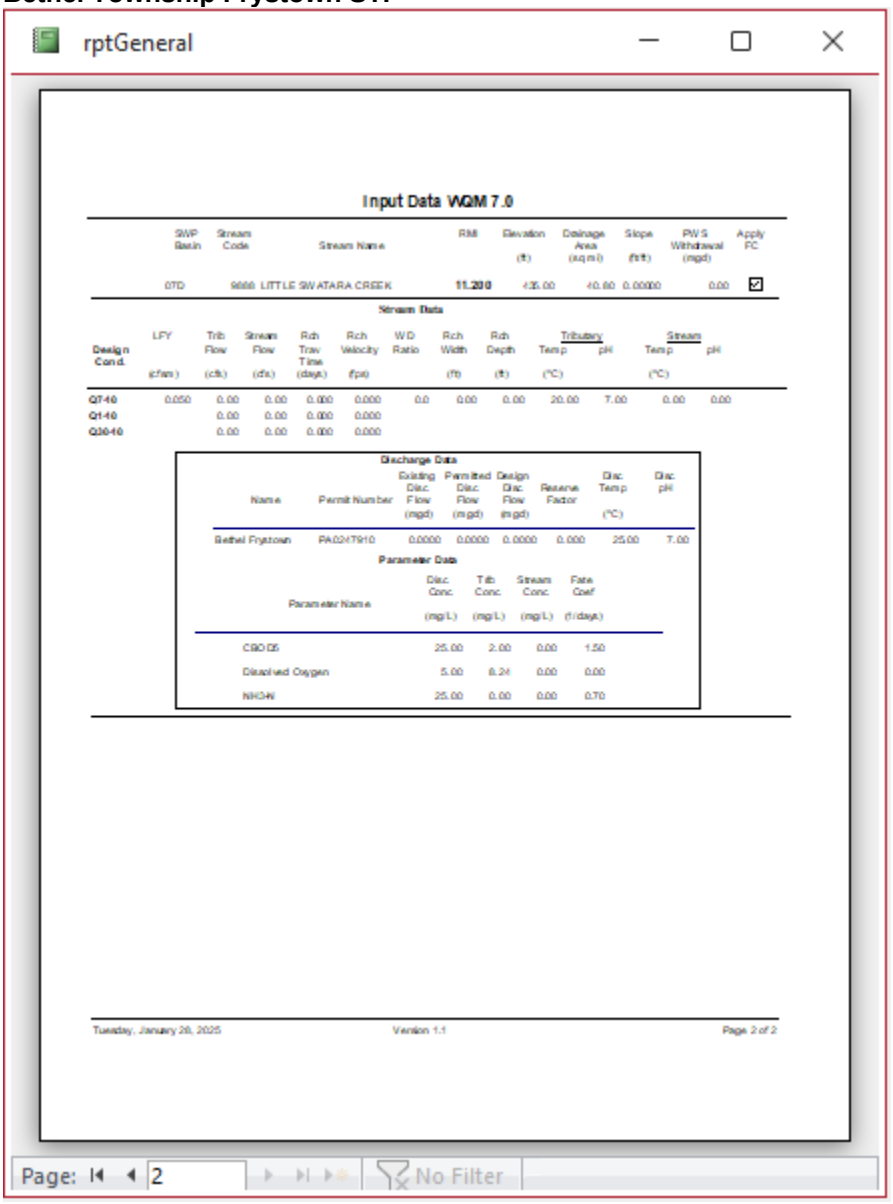
rptGeneral
Input Data WQM 7.0
SWP Basin
Stream Code
Stream Name
RMI
Elevation (ft)
Drainage Area (sq mi)
Slope (ft/ft)
PWS Withdrawal (mgd)
Apply FC
07D
9888
LITTLE SWATARA CREEK
11.200
435.00
40.60
0.00000
0.00
Stream Data
Design Cond.
LFY (cfsm)
Trib Flow (cfs)
Stream Flow (cfs)
Rch Trav Time (days)
Rch Velocity (fps)
WD Ratio
Rch Width (ft)
Rch Depth (ft)
Tributary Temp (°C)
Tributary pH
Stream Temp (°C)
Stream pH
Q7-10 0.050 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 Frystown
PA0247910
0.0000
0.0000
0.0000
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
Tuesday, January 28, 2025
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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	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	XXX	XXX	9.0	1/day	Grab
D.O.	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
UV Intensity (mW/cm²)	XXX	XXX	Report	XXX	XXX	XXX	1/day	Metered
$CBOD_5$	24.0	38.0	XXX	25.0	40.0	50.0	1/week	24-Hr Composite
BOD_5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	24-Hr Composite
TSS	28.0	42.0	XXX	30.0	45.0	60.0	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	2,000 Geo Mean	XXX	10,000	1/week	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	1/week	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/quarter	Grab
Ammonia-Nitrogen	Report	XXX	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Total Phosphorus	Report	XXX	XXX	Report	XXX	XXX	1/week	24-Hr Composite

Compliance Sampling Location:

Other Comments:

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
	Monthly	Annual	Monthly	Monthly Average	Maximum	Instant. Maximum		
Ammonia--N	Report	Report	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Kjeldahl--N	Report	XXX	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Nitrate-Nitrite as N	Report	XXX	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Total Nitrogen	Report	Report	XXX	Report	XXX	XXX	1/month	Calculation
Total Phosphorus	Report	Report	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Net Total Nitrogen	Report	8,045	XXX	XXX	XXX	XXX	1/month	Calculation
Net Total Phosphorus	Report	188	XXX	XXX	XXX	XXX	1/month	Calculation

Compliance Sampling Location:

Other Comments:

Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment)
☒	Toxics Management Spreadsheet (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, 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: BCW-PMT-033
☐	Other: