Pennsylvania Department of Environmental Protection

Southeast Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0058572**
Facility Type	**Non-Municipal**	APS ID	**1110915**
Major / Minor	**Minor**	Authorization ID	**1479508**

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Aqua Pennsylvania Wastewater, Inc.**	Facility Name	**Penn Township WWTP**
Applicant Address	762 W Lancaster Avenue	Facility Address	1017 W Baltimore Pike
	Bryn Mawr, PA 19010-3402		West Grove, PA 19390
Applicant Contact	Todd Duerr	Facility Contact	Kyle Roberts
Applicant Phone	(610) 645-4204	Facility Phone	(610) 520-6384
Client ID	62614	Site ID	543466
Ch 94 Load Status	Not Overloaded	Municipality	Penn Township
Connection Status	No Limitations	County	Chester
Date Application Received	April 2, 2024	EPA Waived?	Yes
Date Application Accepted	May 8, 2024	If No, Reason	

Purpose of Application: NPDES permit renewal application.

Summary of Review

The Pa Department of Environmental Protection (PADEP/Department) received an NPDES permit renewal application from Aqua Pennsylvania Wastewater, Inc. (permittee) on April 2, 2024 for Permittee's Penn Township STP (facility). This is a minor sewage facility with a design flow of 0.35 MGD that discharges into an UNT to E. Br. Big Elk Creek (HQ-TSF, MF) in state watershed 7-K. The current permit expired on September 30, 2024. The terms and conditions of the current permit is automatically extended since the renewal application was received at least 180 days prior to expiration date. Renewal NPDES permit application under Clean Water Program are not covered by PADEP's PDG per 021-2100-001. This fact sheet is developed in accordance with 40 CFR §124.56.

Changes to existing permit: Added: Total Zinc, E. Coli.

Sludge use and disposal description and location(s): Digested sludge are hauled-off by licensed hauler.

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.

Approve	Deny	Signatures	Date
√		Reza H. Chowdhury, E.I.T. / Project Manager	November 19, 2024
X		Pravin Patel Pravin C. Patel, P.E. / Environmental Engineer Manager	11/19/2024

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	001	Design Flow (MGD)	.39
Latitude	39º 49' 37.35"	Longitude	-75º 53' 21.46"
Quad Name	Oxford	Quad Code	2038
Wastewater Description:	Sewage Effluent		
Receiving Waters	Unnamed Tributary of East Branch Big Elk Creek (HQ-TSF, MF)	Stream Code	06751
NHD Com ID	112188662	RMI	0.62
Drainage Area	0.51 mi^2	Yield (cfs/mi^2)	0.1
Q_{7-10} Flow (cfs)	0.051	Q_{7-10} Basis	StreamStats
Elevation (ft)	458.99	Slope (ft/ft)	
Watershed No.	7-K	Chapter 93 Class.	HQ-TSF, MF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	ORGANIC ENRICHMENT, ORGANIC ENRICHMENT, ORGANIC ENRICHMENT, ORGANIC ENRICHMENT		
Source(s) of Impairment	GRAZING IN RIPARIAN OR SHORELINE ZONES, GRAZING IN RIPARIAN OR SHORELINE ZONES, GRAZING IN RIPARIAN OR SHORELINE ZONES, GRAZING IN RIPARIAN OR SHORELINE ZONES		
TMDL Status		Name	

Background/Ambient Data		Data Source
pH (SU)	7.0	Default
Temperature (°C)	20	Default
Hardness (mg/L)	100	Default
Other:		

Nearest Downstream Public Water Supply Intake: None before PA-MD border

Changes Since Last Permit Issuance: WQM permit 1501401 was amended on March 21, 2022 to approve installation of 2 final clarifiers and associated sludge pumping facilities at the facility's BESST system. This was a part of first phase of modifications at the facility.

Other Comments:

Streamflow:

The USGS's web based watershed delineation tool StreamStats (accessible at https://streamstats.usgs.gov/ss/, accessed on November 13, 2024) was utilized to determine the drainage area at discharge point. The drainage area at Outfall 001 was found to be 0.51 mi^2. A default yield of 0.1 cfs/mi^2 will be utilized to calculate the Q7-10 at the outfall 001.

Q_{7-10} at Outfall 001: 0.51*0.1 or 0.051 cfs.

Default Q_{1-10}:Q_{30-10} of 0.64 and default Q_{30-10}:Q_{7-10} of 1.36 (per 391-2000-007) will be used for modeling.

PWS Intake:

There's no downstream PWS intake before PA-MD border.

Wastewater Characteristics:

Default pH of 7.0, default discharge temperature of 25°C, and default hardness of 100 mg/l will be used for modeling.

Background data:

Default pH of 7.0, default temperature of 20°C, and default hardness of 100 mg/l will be used for modeling, as appropriate.

Antidegradation (93.4):

The effluent limits for this discharge have been developed to ensure that existing in-stream water uses and the level of water quality necessary to protect the existing uses are maintained and protected. The receiving streams are designated as High-Quality Trout Stocking (HQ-TSF) and Migratory Fishes (MF.) The ABACT limits was considered during the development of final effluent limits.

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

Treatment Facility Summary

Treatment Facility Name: Penn Township WWTP

WQM Permit No.	Issuance Date
1501401 A-1	3/21/2022
1501401	01/07/2020

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary With Total Nitrogen Reduction	Sequencing Batch Reactor, BESTT	Ultraviolet	0.35

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.429	976	Not Overloaded	Aerobic Digestion	Other WWTP

Treatment Plant Description

The wastewater treatment facility (WWTF), as currently constructed, incorporates two different biologic wastewater treatment processes; Sequencing Batch Reactor (SBR) and Biologically Engineered Single Sludge Treatment (BESST®). Both treatment processes are products of Purestream®, Walton, KY.

The treatment processes consists of: two prefabricated steel sequencing batch reactor (SBR) each having a rated capacity of 0.125 MGD, two cast-in-place concrete Biologically Engineered Single Sludge Treatment (BESST®) each having a rated capacity of 0.175 MGD, a Lakeside Rotomat® screen with parallel by-pass bar screen, a variable speed BESSAT® system effluent pump station, a decant equalization/reaeration tank, two alternating ultraviolet (UV) disinfection units, an effluent pump station with a meter to measure the total flow from the wastewater treatment plant, and immediately downstream for the effluent pump station is a flow diversion valve pit employed to direct treated effluent to either the four (4) existing RIBs or to the Conard-Pyle storage pond.

There are two (2) prefabricated steel SBRs, each having a rated capacity of 0.125 MGD, which operate in parallel and two (2) cast-in-place concrete BESST® systems, each having a rated capacity of 0.175 MGD, set back to back which also operate in parallel. The total treatment capacity associated with these four (4) treatment units is therefore 0.600 MGD.

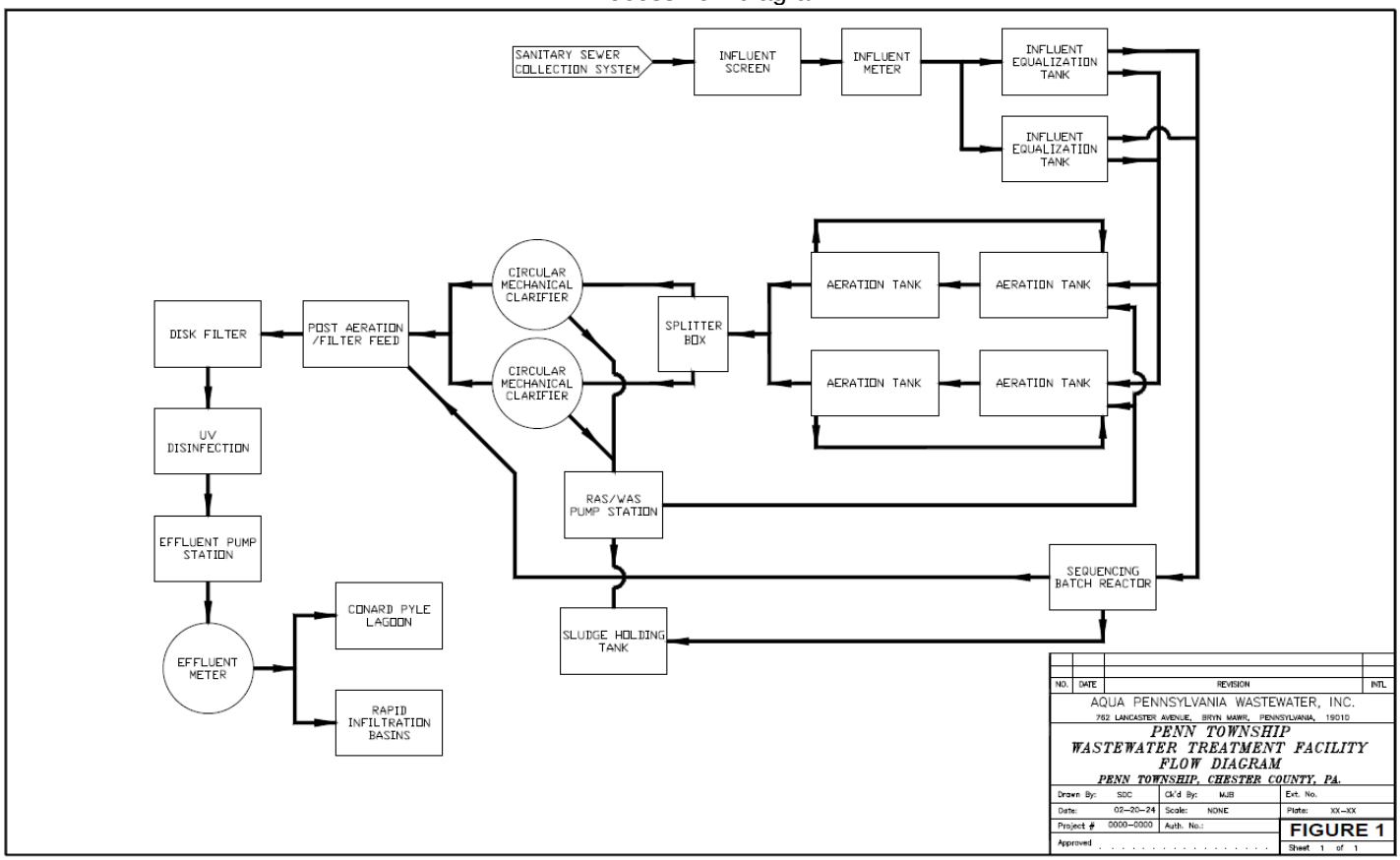
The current permit limits overall system capacity to 0.390 MGD to be treated at the facility, however, the discharge flow to the stream is limited to 0.35 MGD. The current WQM Permit provides for up to 0.390 MGD of reclamation capacity. However, Aqua has the option of directing the entire amount to the Conad-Pyle facility or some to the Conrad-Pyle and some to the existing Rapid Infiltration Basins (RIBs). The permitted maximum organic load is 976 lbs./day. Due to various operational considerations, both the BESST® system (both treatment units) and SBRs (one of the two systems) have been used throughout the year. Use of both systems and three of the four treatment trains ensures that all components are functioning properly and exercised routinely.

In addition to the biological treatment units, the WWTF includes: a Lakeside Rotomat® screen with parallel by-pass bar screen; a variable speed BESST® system, effluent pump station; a decant equalization/reaeration tank; two (2) alternating ultraviolet (UV) disinfection units; and an effluent pump station with a meter to measure the total flow from the WWTF.

Immediately downstream of the effluent pump station is a flow diversion valve pit. This valve is employed to direct treated effluent to either the four (4) existing RIBs or to the 12.7 MG treated effluent storage pond on the Conard-Pyle property; the effective storage capacity is 9.1 MG. Currently all flow is directed to Conrad-Pyle where it is used to irrigate potted plants.

The storage pond will overflow via an outlet structure to a smaller on-stream pond that was used by Conard-Pyle for irrigation. This discharge from the pond is to an unnamed tributary of East Branch Big Elk Creek, a HQ-TSF stream in the Chesapeake Bay watershed.

Process flow diagram



The agreement to discharge into Conard-Pyle property will expire on October 19, 2026 and the permittee was issued a PTR on April 23, 2024 with limits developed to discharge all of the treated effluent to the UNT to East Branch Big Elk Creek. The receiving stream is special protection water for being HQ and a Chesapeake Bay watershed. The PTR provided limits that were developed to maintain the existing stream quality and non-degrading. The discharge flow is below CB's significant discharger cutoff of 0.4 MGD and no Cap loads were assigned to this facility. However, TN and TP mass limits were proposed in the PTR as a non-degrading measure. The permittee will be required to amend the NPDES permit in the future if they plan to discharge the treated effluent directly to the stream.

The facility uses the following wastewater treatment chemicals:

Wastewater Treatment Chemical	Purpose	Maximum Usage Rate	Units
Polyaluminum Chloride	Coagulant - Phosphorus Reduction	48	gal/day
Sodium Bicarbonate	Alkalinity Adjustment	200	lbs/week
Sodium Hypochlorite	Cleaning	32	oz/week

Biosolids management:
The digested biosolids are hauled-off site by HydroTech Environmental, LLC for further processing and disposal.

Compliance History

DMR Data for Outfall 001 (from October 1, 2023 to September 30, 2024)

Parameter	SEP-24	AUG-24	JUL-24	JUN-24	MAY-24	APR-24	MAR-24	FEB-24	JAN-24	DEC-23	NOV-23	OCT-23
Flow (MGD) Average Monthly	0.1833	0.2003	0.1893	0.1952	0.2115	0.2449	0.2353	0.2173	0.2303	0.2213	0.1935	0.1660
pH (S.U.) IMIN	7.3	7.2	7.3	7.2	7.2	7.2	7.1	7.2	7.1	7.1	7.3	7.1
pH (S.U.) IMAX	8.0	8.0	7.8	8.0	7.7	7.7	8.0	8.0	7.7	7.8	7.9	7.9
DO (mg/L) IMIN	7.2	7.0	6.6	7.0	7.6	8.9	7.5	8.4	8.2	9.0	8.5	7.6
CBOD5 (lbs/day) Average Monthly	< 3.4	< 4	< 3.3	< 3.3	< 3.8	< 4.4	< 4.0	< 3.7	< 4.7	< 4.4	< 4.1	< 3.0
CBOD5 (lbs/day) Raw Sewage Influent Average Monthly	694.87	589	508	763	690	652	536	604	561	552	375	316
CBOD5 (lbs/day) Raw Sewage Influent Daily Maximum	907.47	787	588	974	1255	1087	613	910	734	634	573	400
CBOD5 (mg/L) Average Monthly	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2.28	< 3	< 2
CBOD5 (mg/L) Raw Sewage Influent Average Monthly	311.25	237	235	342	266	204	192	241	254	258	261	198
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	862.99	762	586	841	742	906	924	768	678	697	409	389
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	1001.96	902	607	1111	1257	1307	1352	938	1192	914	591	413
BOD5 (mg/L) Raw Sewage Influent Average Monthly	382.50	315	273	376	287	291	327	305	319	313	281	244
TSS (lbs/day) Average Monthly	4.0	< 2	< 2.6	< 2.6	3.5	< 2.2	< 2.2	< 2.0	2.9	< 1.2	2.9	< 1.6
TSS (lbs/day) Raw Sewage Influent Average Monthly	787.12	735	501	473	591	745	968	577	509	576	382	457
TSS (lbs/day) Raw Sewage Influent Daily Maximum	1058.54	1060	682	529	736	863	1398	1053	769	884	646	570
TSS (mg/L) Average Monthly	2	< 1	< 2	< 2	2	< 1	< 1	< 1.1	1.28	< 1	2	< 1

TSS (mg/L) Raw Sewage Influent Average Monthly	341.00	298	232	210	230	248	344	223	247	258	279	285
Fecal Coliform (CFU/100 ml) Geometric Mean	< 5	< 1	< 2	< 1	< 1	< 1	< 4	12	< 6	< 5	5	3
Fecal Coliform (CFU/100 ml) IMAX	58	3	10	1	< 1	1	41	75	24	76	96	13
UV Transmittance (%) Minimum	73.5	77.0	75.3	71.7	73.9	73.4	75.4	78.0	78.5	76.8	74.5	71.8
Nitrate-Nitrite (mg/L) Average Monthly	8.41	< 4.52	< 4.26	< 4.87	< 4.17	< 5.63	4.71	< 4.76	5.42	< 6.48	< 7.14	< 6.68
Nitrate-Nitrite (lbs) Total Monthly	426	< 255	218.34	< 237.84	< 240.56	< 362.11	289.82	< 258.65	410.48	< 390.52	349.07	< 304.72
Total Nitrogen (mg/L) Average Monthly	< 9.27	< 5.44	< 5.02	< 5.79	< 5.04	< 6.75	6.06	< 6.38	< 6.42	< 7.44	< 8.15	< 7.44
Total Nitrogen (lbs) Total Monthly	< 469.45	< 307	258.24	< 282.93	< 290.96	< 434.73	377.5	< 345.22	< 473.84	< 449.56	< 398.79	< 339.70
Ammonia (lbs/day) Average Monthly	< 0.8	< 0.9	< 0.8	< 0.8	< 0.9	< 1.1	< 1.7	< 1.0	< 1.1	< 1.0	< 0.8	< 0.7
Ammonia (mg/L) Average Monthly	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.8	< 0.6	< 0.5	< 0.5	< 0.5	< 0.5
Ammonia (lbs) Total Monthly	< 25.27	< 28	< 25.65	< 24.42	< 29.07	< 33.17	< 51.88	< 30.30	< 34.92	< 30.54	< 24.4	< 22.82
TKN (mg/L) Average Monthly	0.86	0.93	< 0.76	< 0.92	< 0.88	1.12	1.36	1.62	1.00	0.97	1.01	0.76
TKN (lbs) Total Monthly	43	52	< 39.9	< 45.08	< 50.71	72.62	87.68	86.57	63.36	59.04	49.72	34.98
Total Phosphorus (lbs./day) Average Monthly	1.0	0.4	0.4	0.5	0.7	0.5	0.2	0.2	0.3	0.2	0.1	< 0.1
Total Phosphorus (mg/L) Average Monthly	0.6	0.2	0.2	0.3	0.4	0.3	0.1	0.1	0.1	0.1	0.1	< 0.1
Total Phosphorus (lbs.) Total Monthly	29.96	12	11.84	15.57	21.45	15.21	6.06	6.01	8.55	4.94	4.28	< 2.52

Facility inspection summary:

04/25/2024: CEI conducted. No violation noted.
05/31/2023: CEI conducted. No violation noted.
06/15/2022: CEI conducted. No violation noted.

Existing Limits

The following limits were applied for Outfall 001 for the permit term October 1, 2019 through September 30, 2024:

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	Report	XXX	XXX	XXX	XXX	XXX	Continuous	Recorded
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
Dissolved Oxygen	XXX	XXX	6.0 Inst Min	XXX	XXX	XXX	1/day	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5) Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Carbonaceous Biochemical Oxygen Demand (CBOD5)	29.2	XXX	XXX	10	XXX	20	1/week	24-Hr Composite
Biochemical Oxygen Demand (BOD5) Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Total Suspended Solids	29.2	XXX	XXX	10	XXX	20	1/week	24-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Fecal Coliform (CFU/100 ml)	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/week	Grab
Ultraviolet light transmittance (%)	XXX	XXX	Report	XXX	XXX	XXX	1/day	Measured
Ammonia-Nitrogen Nov 1 - Apr 30	13.1	XXX	XXX	4.5	XXX	9	1/week	24-Hr Composite
Ammonia-Nitrogen May 1 - Oct 31	4.4	XXX	XXX	1.5	XXX	3	1/week	24-Hr Composite
Total Phosphorus	2.9	XXX	XXX	1.0	XXX	2	1/week	24-Hr Composite

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** .35
Latitude 39º 49' 38.00" **Longitude** -75º 53' 21.00"
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)

ABACT Limitations

Since the receiving stream is a special protection water, ABACT limits were considered. The following table summarizes the ABACT limitations:

Parameter	*Treatment Process Performance Expectations (mg/l)*		
	<2,000	*2,000 to 50,000 gpd*	*>50,000*
$CBOD_5$ (May 1, - Oct. 31)	*10*	*10*	*10*
$CBOD_5$ (Nov. 1, - Apr. 30)	*20*	*20*	*10*
Suspended Solids	*20*	*10*	*10*
NH_3-N (May 1 - Oct. 31)	*5.0*	*3.0*	*1.5*
NH_3-N (Nov. 1 - Apr. 30)	*15.0*	*9.0*	*4.5*
Effective Disinfection	*- - - See footnote below - - - **		
Other Parameters as needed	*- - - Determined by the size and characteristics of the proposed discharge, may include - NO_2/NO_3-N, Total Phosphorus, Copper, Lead, Zinc - - -*		

* Disinfection should be accomplished using a method that leaves no detectable residual. Disinfection using ultra-violet light or other non-chlorine based systems is encouraged and must be considered.

1997 Dry Stream Limits:

The Q7-10 at the discharge point is 0.051 cfs and the average annual design flow if 0.35 MGD or 0.54 cfs. The Q7-10:discharge ratio is 0.051:0.54 or 0.094:1, much lower than threshold 3:1. Therefore, the discharge is considered into a dry stream. Since the facility was permitted in 2001 and constructed in 2002, the 1997 dry stream guidance (391-2000-

014) limits were applicable, not the updated 2008 dry stream guidance. The 2008 guidance may be applicable if the facility wants to expand in the future. The 1997 limits are as follows:

b. The 'minimum treatment" requirements for a discharge into this type of a drainage ditch are:

BOD and TSS -	10 mg/l as a monthly average 20 mg/l as an instantaneous maximum
NH3 - N -	3 mg/l as a monthly average number
D.O. -	3 mg/l or greater, as a monthly average
Bacteria -	(1) For the summertime, provide effective disinfection as described in Sections 95.2 and 95.7 in the Rules and Regulations (2) For the remainder of the year, provide effective wintertime disinfection in the ditch at the point of discharge in accordance with Bac_1, in Section 93.7 in the Rules and Regulations.

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

Water Quality-Based Limitations
Model input data

The following data will be used for modeling, as needed:

- Discharge pH 7.0 (Default)
- Discharge Temperature 25°C (Default)
- Discharge Hardness 100 mg/l (Default)
- Stream pH 7.0 (Default)
- Stream Temperature 20.0°C (Default)
- Stream Hardness 100 mg/l (Default)

The following two nodes were used in modeling:

Node 1: At the outfall 001 on UNT to East Branch Big Elk Creek (06751)

Elevation:	458.99 ft (National Map-Advanced Viewer, 11/13/2024)
Drainage Area:	0.51 mi^2 (StreamStat Version 3.0, 11/13/2024)
River Mile Index:	0.62 (PA DEP eMapPA)
Low Flow Yield:	0.1 cfs/mi^2
Q_{7-10}:	0.051 cfs
Discharge Flow:	0.35 MGD

Node 2: At confluence with UNT 06750

Elevation:	422.9 ft (National Map-Advanced Viewer, 11/13/2024)
Drainage Area:	2.47 mi^2 (StreamStat Version 3.0, 11/13/2024)
River Mile Index:	0.0 (PA DEP eMapPA)
Low Flow Yield:	0.1 cfs/mi^2
Discharge Flow:	0.0 MGD

WQM 7.0 Model

WQM 7.0 version 1.11 is a water quality model designed to assist DEP to determine appropriate effluent limits for $CBOD_5$, NH_3-N and DO. The model simulates two basic processes. In the NH_3-N module, the model simulates the 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. In the D.O. module, the model simulates the 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. The model was utilized for this permit renewal by using Q_{7-10} and current background water quality levels of the stream.

NH_3-N
WQM 7.0 suggested NH_3-N limit of 1.5 mg/l as monthly average and 3.0 mg/l as IMAX limit during summer to protect water quality standards. The limits are the same as existing permit and will be carried over.

CBOD5
WQM 7.0 suggests CBOD5 limit of 10.0 mg/l as AML which is the same as existing limit. Existing AML, MDL, and IMAX will be carried over, along with their respective mass limits.

DO
WQM 7.0 suggests minimum DO of 6.0 mg/l which is the model input and same as existing limit. Existing limit will be carried over.

General Discussion on Toxics Management Spreadsheet (TMS)
Based on the available data, PADEP utilizes Toxics Management Spreadsheet (TMS) to (1) evaluate reasonable potential for toxic pollutants to cause or contribute to an excursion above the water quality standards and (2) develop WQBELs for those such toxic pollutants (i.e., 40 CFR § 122.44(d)(1)(i)). It is noteworthy that some of these pollutants that may be reported as "non-detect", but still exceeded the criteria, were determined to be candidates for modeling because the method detection levels used to analyze those pollutants were higher than target QLs and/or the most stringent Chapter 93 criteria. The model then recommended the appropriate action for the Pollutants of Concerns based on the following logic as stated in PADEP's SOP titled *"Establishing Water Quality-Based Effluent Limitations (WQBELs) and Permit Conditions for Toxic Pollutants in NPDES Permits for Existing Dischargers (DEP SOP No.: BCW-PMT-037, Revised May 20, 2021)"*:

1. In general, establish limits in the draft permit where the effluent concentration determined in B.1 or B.2 equals or exceeds 50% of the WQBEL (i.e., RP is demonstrated). Use the average monthly, maximum daily and instantaneous maximum (IMAX) limits for the permit as recommended by the TMS (or, if appropriate, use a multiplier of 2 times the average monthly limit for the maximum daily limit and 2.5 times the average monthly limit for IMAX).

2. For non-conservative pollutants, in general, establish monitoring requirements where the effluent concentration determined in B.1 or B.2 is between 25% - 50% of the WQBEL.

3. For conservative pollutants, in general, establish monitoring requirements where the effluent concentration determined in B.1 or B.2 is between 10% - 50% of the WQBEL.

NOTE 4 – If the effluent concentration determined in B.1 or B.2 is "non-detect" at or below the target quantitation limit (TQL) for the pollutant as specified in the TMS and permit application, the pollutant may be eliminated as a candidate for WQBELs or monitoring requirements unless 1) a more sensitive analytical method is available for the pollutant under 40 CFR Part 136 where the quantitation limit for the method is less than the applicable water quality criterion and 2) a detection at the more sensitive method may lead to a determination that an effluent limitation is necessary, considering available dilution at design conditions.

NOTE 5 – If the effluent concentration determined in B.1 or B.2 is a detection below the TQL but above or equal to the applicable water quality criterion, WQBELs or monitoring may be established for the pollutant.

4. Application managers may, on a site- and pollutant-specific basis, deviate from these guidelines where there is specific rationale that is documented in the fact sheet.

Major sewage facilities are required to sample for pollutants group 1-5, at a minimum, and 6 and/or 7, if applicable. TMDL parameters, as applicable, are also required to be sampled if they aren't covered in any pollutant groups or by Part A of the permit. Pollutants groups 2-7 are modeled through TMS. The facility is required to provide at least three sample results of the effluent from outfall(s) discharging processed wastewater. The permittee submitted at least three sample results of all pollutants in groups 1-5. Maximum sample results of a given pollutant is the input of the model if the sample size is less than 10. For pollutants with sample size ≥ 10, PADEP utilizes TOXCONC to calculate Average Monthly Effluent Concentration (AMEC) and Coefficient of Variation (CoV) to refine the model input. The statistical methodologies used in this spreadsheet are taken from EPA's *TSD for Water Quality-based Toxics Control, Appendix E* and are

consistent with PADEP's technical guidance 391-2000-024. The pollutants are modeled through TMS and output from the TMS is provided below:

☑ ***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
Total Zinc	Report	Report	Report	Report	Report	mg/L	0.12	AFC	Discharge Conc > 10% WQBEL (no RP)

Total Zinc:
TMS model suggests monitoring requirements for Total Zinc from a model input value of 0.029 mg/l. A quarterly monitoring will be added.

Total Phosphorus:
The current permit has a Total Phosphorus limit of 1.0 mg/l as ABACT and will be continued.

Fecal Coliform:
The current permit has a year-round Fecal Coliform limit of 200 CFU/100 ml and IMAX limit of 1000 CFU/100 ml which will be carried over.

E. Coli:
Pa Code 25 § 92a. 61 requires monitoring of E. Coli. DEP's SOP titled "Establishing Effluent Limitations for Individual Sewage Permits (BCW-PMT-033, revised March 24, 2021) recommends quarterly E. Coli monitoring. This requirement will be applied from this permit term.

pH:
The TBEL for pH is above 6.0 and below 9.0 S.U. (40 CFR §133.102(c) and Pa Code 25 §§ 95.2(1), 92a.47) which are existing limits and will be carried over.

Total Suspended Solids (TSS):
There is no water quality criterion for TSS. The limits of 30 mg/L average monthly, 45 mg/l average weekly, and 60 mg/L instantaneous maximum are the minimum level of effluent quality attainable by secondary treatment, 25 Pa. Code § 92a.47 and 40CFR 133.102(b). However, ABACT and Dry Stream Guidance limits are more stringent. The current permit reflects the ABACT and Dry Stream Guidance limits which will be carried over.

UV Disinfection:
PADEP's SOP BCW-PMT-033 recommends UV parameter monitoring where UV is used as a method of disinfection, with the same frequency as would be if Chlorine is used for disinfection. The current permit has UV Transmittance in % reporting requirement which will be carried over in this renewal.

Total Nitrogen and its constituents:
PADEP's SOP BCW-PMT-033 recommends monitoring for Total Nitrogen for facilities with design flow more than 2000-GPD, which is also supported by Pa Code 25 Ch. 92a.61. Current permit has monitoring requirements for TN and its constituents which will be carried over.

Chesapeake Bay Nutrients Monitoring:
The facility is considered a non-significant Phase 4 CB discharger, based on its flow of 0.35 MGD. The Phase 3 Watershed Implementation Plan (Phase 3 WIP), dated July 29, 2022, details the nutrients monitoring requirements for non-significant facilities. The current permit has monitoring requirements for CB Nutrients and will be carried over.

Monitoring Frequency and Sample Types:
Otherwise specified above, the monitoring frequency and sample type of compliance monitoring for existing parameters are recommended by DEP's SOP and Permit Writers Manual and/or on a case-by-case basis using best professional judgment (BPJ).

Flow and Influent BOD_5 and TSS Monitoring Requirement:
The requirement to monitor the volume of effluent will remain in the draft permit per 40 CFR § 122.44(i)(1)(ii). Influent BOD_5 and TSS monitoring requirements are established in the permit per the requirements set in Pa Code 25 Chapter 94.

Anti-Backsliding

Anti-backsliding prohibition is justified in sections where an exception is justified for the affected pollutant(s). For remaining pollutants, this prohibition isn't applicable since the proposed limits are at least as stringent as were in current permit.

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	Daily Maximum	Daily Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	Report	XXX	XXX	XXX	XXX	XXX	Continuous	Recorded
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	6.0 Inst Min	XXX	XXX	XXX	1/day	Grab
CBOD5	29.2	XXX	XXX	10	XXX	20	1/week	24-Hr Composite
CBOD5 Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	1/week	24-Hr Composite
BOD5 Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	1/week	24-Hr Composite
TSS Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	1/week	24-Hr Composite
TSS	29.2	XXX	XXX	10	XXX	20	1/week	24-Hr Composite
Fecal Coliform (No./100 ml)	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
UV Transmittance (%)	XXX	XXX	Report	XXX	XXX	XXX	1/day	Measured
Nitrate-Nitrite	XXX	XXX	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Nitrate-Nitrite (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
Total Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	1/month	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	Daily Maximum	Daily Minimum	Average Monthly	Maximum	Instant. Maximum		
Total Nitrogen (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
Ammonia Nov 1 - Apr 30	13.1	XXX	XXX	4.5	XXX	9	1/week	24-Hr Composite
Ammonia May 1 - Oct 31	4.4	XXX	XXX	1.5	XXX	3	1/week	24-Hr Composite
Ammonia (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
TKN	XXX	XXX	XXX	Report	XXX	XXX	1/week	24-Hr Composite
TKN (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
Total Phosphorus	2.9	XXX	XXX	1.0	XXX	2	1/week	24-Hr Composite
Total Phosphorus (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation

Compliance Sampling Location: At Outfall 001

Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, to comply with Pennsylvania's Chesapeake Bay Tributary Strategy.

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

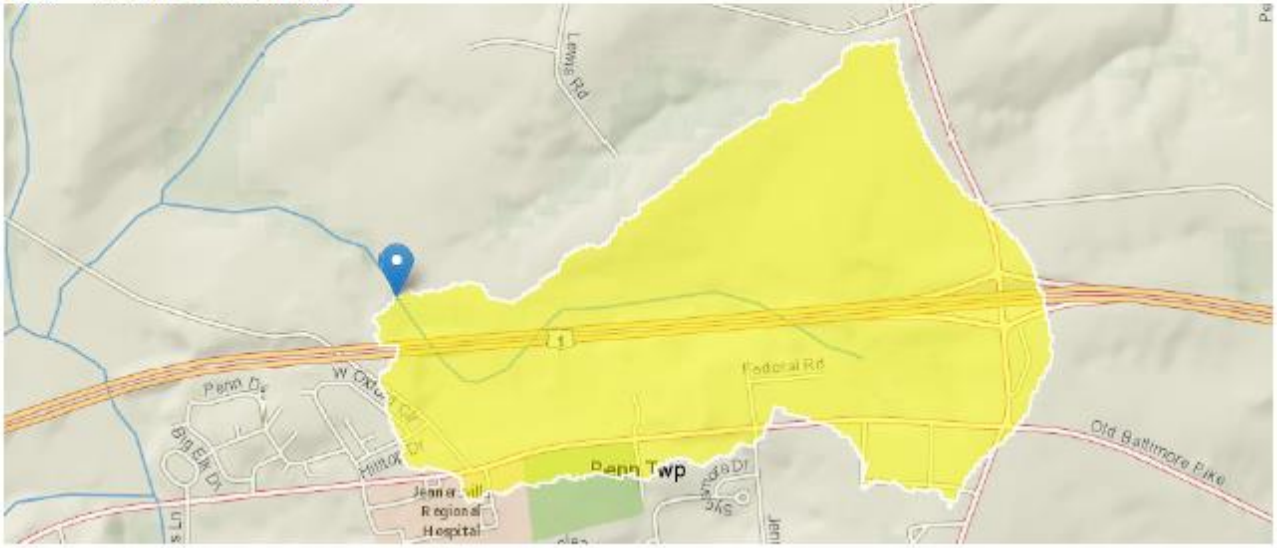
Compliance Sampling Location: At Outfall 001

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:
☐	Other:

StreamStats at Outfall 001

StreamStats Report

Region ID: PA
Workspace ID: PA20241113151548569000
Clicked Point (Latitude, Longitude): 39.82716, -75.88926
Time: 2024-11-13 10:16:11 -0500



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
BSLOPD	Mean basin slope measured in degrees	2.4493	degrees
DRNAREA	Area that drains to a point on a stream	0.51	square miles
ROCKDEP	Depth to rock	5	feet
URBAN	Percentage of basin with urban development	17.8776	percent

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region 1]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.51	square miles	4.78	1150
BSLOPD	Mean Basin Slope degrees	2.4493	degrees	1.7	6.4
ROCKDEP	Depth to Rock	5	feet	4.13	5.21
URBAN	Percent Urban	17.8776	percent	0	89

Low-Flow Statistics Disclaimers [Low Flow Region 1]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Low-Flow Statistics Flow Report [Low Flow Region 1]

Statistic	Value	Unit
7 Day 2 Year Low Flow	0.076	ft^3/s
30 Day 2 Year Low Flow	0.112	ft^3/s
7 Day 10 Year Low Flow	0.0279	ft^3/s
30 Day 10 Year Low Flow	0.0435	ft^3/s
90 Day 10 Year Low Flow	0.0915	ft^3/s

Low-Flow Statistics Citations

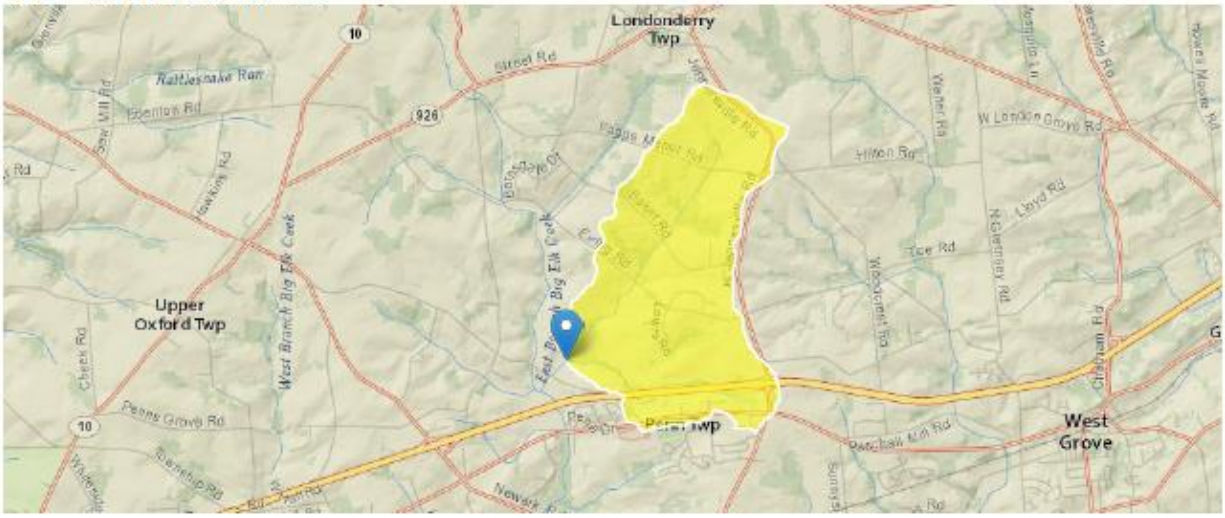
Stuckey, M.H.,2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p. (http://pubs.usgs.gov/sir/2006/5130/)

Application Version: 4.24.0
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

StreamStats at node 2

StreamStats Report at node 2

Region ID: PA
Workspace ID: PA20241113175347173000
Clicked Point (Latitude, Longitude): 39.82947, -75.89725
Time: 2024-11-13 12:54:09 -0500



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
BSLOPD	Mean basin slope measured in degrees	2.7125	degrees
DRNAREA	Area that drains to a point on a stream	2.47	square miles
ROCKDEP	Depth to rock	5	feet
URBAN	Percentage of basin with urban development	4.5445	percent

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region 1]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	2.47	square miles	4.78	1150
BSLOPD	Mean Basin Slope degrees	2.7125	degrees	1.7	6.4
ROCKDEP	Depth to Rock	5	feet	4.13	5.21
URBAN	Percent Urban	4.5445	percent	0	89

Low-Flow Statistics Disclaimers [Low Flow Region 1]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Low-Flow Statistics Flow Report [Low Flow Region 1]

Statistic	Value	Unit
7 Day 2 Year Low Flow	0.333	ft^3/s
30 Day 2 Year Low Flow	0.477	ft^3/s
7 Day 10 Year Low Flow	0.128	ft^3/s
30 Day 10 Year Low Flow	0.191	ft^3/s
90 Day 10 Year Low Flow	0.379	ft^3/s

Low-Flow Statistics Citations

Stuckey, M.H.,2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p. (http://pubs.usgs.gov/sir/2006/5130/)

Application Version: 4.24.0
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

WQM 7.0

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	6751	Trib 06751 of E Branch Big Elk Cr	**0.620**	458.99	0.51	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	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
Aqua Penn TWP	PA0058572	0.3500	0.3500	0.3500	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	10.00	2.00	0.00	1.50
Dissolved Oxygen	6.00	8.24	0.00	0.00
NH3-N	1.50	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	6751	Trib 06751 of E Branch Big Elk Cr	**0.000**	422.90	2.47	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	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
		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	3.00	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	6751	Trib 06751 of E Branch Big Elk Cr

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												
0.620	0.05	0.00	0.05	.5414	0.01102	.477	6.4	13.4	0.19	0.195	24.57	7.00
Q1-10 Flow												
0.620	0.03	0.00	0.03	.5414	0.01102	NA	NA	NA	0.19	0.199	24.72	7.00
Q30-10 Flow												
0.620	0.07	0.00	0.07	.5414	0.01102	NA	NA	NA	0.20	0.192	24.43	7.00

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	1.36	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	6		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
07K	6751	Trib 06751 of E Branch Big Elk Cr

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
0.620	Aqua Penn TWP	11.34	3	11.34	3	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
0.620	Aqua Penn TWP	1.42	1.5	1.42	1.5	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)		
0.62	Aqua Penn TWP	10	10	1.5	1.5	6	6	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
07K	6751	Trib 06751 of E Branch Big Elk Cr

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
0.620	0.350	24.570	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
6.396	0.477	13.400	0.194
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
9.31	1.467	1.37	0.995
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.193	31.669	Owens	6
Reach Travel Time (days)			
0.195			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.020	8.99	1.34	6.78
0.039	8.68	1.32	7.11
0.059	8.38	1.29	7.30
0.078	8.08	1.27	7.41
0.098	7.80	1.24	7.49
0.117	7.53	1.22	7.54
0.137	7.27	1.20	7.58
0.156	7.02	1.17	7.59
0.176	6.78	1.15	7.59
0.195	6.54	1.13	7.59

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
07K	6751	Trib 06751 of E Branch Big Elk Cr

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)
0.620	Aqua Penn TWP	PA0058572	0.350	CBOD5	10		
				NH3-N	1.5	3	
				Dissolved Oxygen			6

TMS

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.4, May 2023

Discharge Information

Instructions | Discharge | Stream

Facility: Aqua Penn Township STP NPDES Permit No.: PA0058572 Outfall No.: 001

Evaluation Type: Major Sewage / Industrial Waste Wastewater Description: Treated 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
0.35	100	7						

					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											
	Chloride (PWS)	mg/L											
	Bromide	mg/L											
	Sulfate (PWS)	mg/L											
	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	mg/L		0.001									
	Free Cyanide	µg/L											
	Total Cyanide	µg/L											
	Dissolved Iron	µg/L											
	Total Iron	µg/L											
	Total Lead	mg/L	<	0.001									
	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	mg/L		0.029									
	Total Molybdenum	µg/L											
	Acrolein	µg/L	<										
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<										
	Benzene	µg/L	<										
	Bromoform	µg/L	<										
	Carbon Tetrachloride	µg/L	<										

Group 3	Chlorobenzene	µg/L											
	Chlorodibromomethane	µg/L	<										
	Chloroethane	µg/L	<										
	2-Chloroethyl Vinyl Ether	µg/L	<										
	Chloroform	µg/L	<										
	Dichlorobromomethane	µg/L	<										
	1,1-Dichloroethane	µg/L	<										
	1,2-Dichloroethane	µg/L	<										
	1,1-Dichloroethylene	µg/L	<										
	1,2-Dichloropropane	µg/L	<										
	1,3-Dichloropropylene	µg/L	<										
	1,4-Dioxane	µg/L	<										
	Ethylbenzene	µg/L	<										
	Methyl Bromide	µg/L	<										
	Methyl Chloride	µg/L	<										
	Methylene Chloride	µg/L	<										
	1,1,2,2-Tetrachloroethane	µg/L	<										
	Tetrachloroethylene	µg/L	<										
	Toluene	µg/L	<										
	1,2-trans-Dichloroethylene	µg/L	<										
	1,1,1-Trichloroethane	µg/L	<										
	1,1,2-Trichloroethane	µg/L	<										
	Trichloroethylene	µg/L	<										
	Vinyl Chloride	µg/L	<										
Group 4	2-Chlorophenol	µg/L	<										
	2,4-Dichlorophenol	µg/L	<										
	2,4-Dimethylphenol	µg/L	<										
	4,6-Dinitro-o-Cresol	µg/L	<										
	2,4-Dinitrophenol	µg/L	<										
	2-Nitrophenol	µg/L	<										
	4-Nitrophenol	µg/L	<										
	p-Chloro-m-Cresol	µg/L	<										
	Pentachlorophenol	µg/L	<										
	Phenol	µg/L	<										
	2,4,6-Trichlorophenol	µg/L	<										
Group 5	Acenaphthene	µg/L	<										
	Acenaphthylene	µg/L	<										
	Anthracene	µg/L	<										
	Benzidine	µg/L	<										
	Benzo(a)Anthracene	µg/L	<										
	Benzo(a)Pyrene	µg/L	<										
	3,4-Benzofluoranthene	µg/L	<										
	Benzo(ghi)Perylene	µg/L	<										
	Benzo(k)Fluoranthene	µg/L	<										
	Bis(2-Chloroethoxy)Methane	µg/L	<										
	Bis(2-Chloroethyl)Ether	µg/L	<										
	Bis(2-Chloroisopropyl)Ether	µg/L	<										
	Bis(2-Ethylhexyl)Phthalate	µg/L	<										
	4-Bromophenyl Phenyl Ether	µg/L	<										
	Butyl Benzyl Phthalate	µg/L	<										
	2-Chloronaphthalene	µg/L	<										
	4-Chlorophenyl Phenyl Ether	µg/L	<										
	Chrysene	µg/L	<										
	Dibenzo(a,h)Anthrancene	µg/L	<										
	1,2-Dichlorobenzene	µg/L	<										
	1,3-Dichlorobenzene	µg/L	<										
	1,4-Dichlorobenzene	µg/L	<										
	3,3-Dichlorobenzidine	µg/L	<										
	Diethyl Phthalate	µg/L	<										
	Dimethyl Phthalate	µg/L	<										
	Di-n-Butyl Phthalate	µg/L	<										
	2,4-Dinitrotoluene	µg/L	<										
	2,6-Dinitrotoluene	µg/L	<										
	Di-n-Octyl Phthalate	µg/L	<										

	1,2-Diphenylhydrazine	µg/L	<										
	Fluoranthene	µg/L	<										
	Fluorene	µg/L	<										
	Hexachlorobenzene	µg/L	<										
	Hexachlorobutadiene	µg/L	<										
	Hexachlorocyclopentadiene	µg/L	<										
	Hexachloroethane	µg/L	<										
	Indeno(1,2,3-od)Pyrene	µg/L	<										
	Isophorone	µg/L	<										
	Naphthalene	µg/L	<										
	Nitrobenzene	µg/L	<										
	n-Nitrosodimethylamine	µg/L	<										
	n-Nitrosodi-n-Propylamine	µg/L	<										
	n-Nitrosodiphenylamine	µg/L	<										
	Phenanthrene	µg/L	<										
	Pyrene	µg/L	<										
	1,2,4-Trichlorobenzene	µg/L	<										
Group 6	Aldrin	µg/L	<										
	alpha-BHC	µg/L	<										
	beta-BHC	µg/L	<										
	gamma-BHC	µg/L	<										
	delta BHC	µg/L	<										
	Chlordane	µg/L	<										
	4,4-DDT	µg/L	<										
	4,4-DDE	µg/L	<										
	4,4-DDD	µg/L	<										
	Dieldrin	µg/L	<										
	alpha-Endosulfan	µg/L	<										
	beta-Endosulfan	µg/L	<										
	Endosulfan Sulfate	µg/L	<										
	Endrin	µg/L	<										
	Endrin Aldehyde	µg/L	<										
	Heptachlor	µg/L	<										
	Heptachlor Epoxide	µg/L	<										
	PCB-1016	µg/L	<										
	PCB-1221	µg/L	<										
	PCB-1232	µg/L	<										
	PCB-1242	µg/L	<										
	PCB-1248	µg/L	<										
	PCB-1254	µg/L	<										
	PCB-1260	µg/L	<										
	PCBs, Total	µg/L	<										
	Toxaphene	µg/L	<										
	2,3,7,8-TCDD	ng/L	<										
Group 7	Gross Alpha	pCi/L											
	Total Beta	pCi/L	<										
	Radium 226/228	pCi/L	<										
	Total Strontium	µg/L	<										
	Total Uranium	µg/L	<										
	Osmotic Pressure	mOs/kg											

Discharge Information 11/19/2024 Page 3

Instructions | Discharge | *Stream*

Receiving Surface Water Name: UNT to E Br Big Elk Crk

No. Reaches to Model: 1

- (•) Statewide Criteria
- ( ) Great Lakes Criteria
- ( ) ORSANCO Criteria

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi²)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	006751	0.62	458.99	0.51			Yes
End of Reach 1	006751	0	422.9	2.47			Yes

$Q_{7\text{-}10}$

Location	RMI	LFY (cfs/mi²)*	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	0.62	0.1										100	7		
End of Reach 1	0	0.1										100	7		

Q_h

Location	RMI	LFY (cfs/mi²)	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	0.62														
End of Reach 1	0														

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

☐ *Hydrodynamics*

☑ *Wasteload Allocations*

☑ *AFC* CCT (min): 0.012 PMF: 1 Analysis Hardness (mg/l): 100 Analysis pH: 7.00

Pollutants	Stream Conc	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	15.3	Chem Translator of 0.96 applied
Total Lead	0	0		0	64.581	81.6	89.3	Chem Translator of 0.791 applied
Total Zinc	0	0		0	117.180	120	131	Chem Translator of 0.978 applied

☑ *CFC* CCT (min): 0.012 PMF: 1 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 Copper	0	0		0	8.956	9.33	10.2	Chem Translator of 0.96 applied
Total Lead	0	0		0	2.517	3.18	3.48	Chem Translator of 0.791 applied
Total Zinc	0	0		0	118.139	120	131	Chem Translator of 0.986 applied

☑ *THH* CCT (min): 0.012 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): 0.275 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	

☑ *Recommended WQBELs & Monitoring Requirements*

No. Samples/Month: 4

Pollutants	Mass Limits AML (lbs/day)	Mass Limits MDL (lbs/day)	Concentration Limits AML	Concentration Limits MDL	Concentration Limits IMAX	Concentration Limits Units	Governing WQBEL	WQBEL Basis	Comments
Total Zinc	Report	Report	Report	Report	Report	mg/L	0.12	AFC	Discharge Conc > 10% WQBEL (no RP)

☑ *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	0.01	mg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	N/A	N/A	Discharge Conc < TQL