Pennsylvania Department of Environmental Protection

Southcentral Regional Office
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Application Type	**Renewal**	Application No.	**PA0035653**
Facility Type	**Non-Municipal**	APS ID	**763592**
Major / Minor	**Minor**	Authorization ID	**1497065**

Applicant and Facility Information

Applicant Name	**PA DOT**	Facility Name	**PA DOT I70 Site 3 Rest Area**
Applicant Address	400 North Street, 6th Floor	Facility Address	Interstate I70 Eb Brush Creek Twp
	Harrisburg, PA 17120		Fulton Co, PA 17563
Applicant Contact	Nicholaus Sahd	Facility Contact	Dennis Clark
Applicant Phone	(717) 951-8685	Facility Phone	(717) 485-3816
Client ID	134834	Site ID	456184
Ch 94 Load Status	Not Overloaded	Municipality	Brush Creek Township
Connection Status		County	Fulton
Date Application Received	August 27, 2024	EPA Waived?	Yes
Date Application Accepted	August 29, 2024	If No, Reason	

Purpose of Application: NPDES permit renewal.

Summary of Review

PA Department of Transportation Rest Area Site 3 wastewater treatment plant has applied to the Department of Environmental Protection (DEP) for reissuance of its National Pollutant Discharge Elimination System (NPDES) permit No. PA0035653. The permit was issued on February 24, 2020, and became effective on March 1, 2020. The Department received the NPDES renewal permit application on August 29, 2024. The existing permit expiration date was February 28, 2025.

The permit authorized discharge of treated sewage from the existing wastewater treatment plant (WWTP) located in Brush Creek Township, Fulton County to Unnamed Tributary to Brush Creek.

This facility has a current hydraulic design capacity flow and average annual design flow of 0.0065 MGD.

The original WQM Part II 2991402 was issued on February 26, 1992.

Sludge use and disposal description and location(s): N/A because sludge hauling by Smith's Septic & Kline's Septic Services.

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

Based on the review outline in this fact sheet, it is recommended that the permit be drafted and published in the Pennsylvania Bulletin for public comments for 30 days.

Approve	Deny	Signatures	Date
X		*Hilaryle* Hilary H. Le / Environmental Engineering Specialist	January 31, 2025
X		Maria D. Bebenek for Daniel W. Martin, P.E. / Environmental Engineer Manager	February 4, 2025

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	001	Design Flow (MGD)	0.0065
Latitude	39º 55' 22.40"	Longitude	-78º 14' 8.34"
Quad Name	Breezewood	Quad Code	
Wastewater Description:	Sewage Effluent		
Receiving Waters	Unnamed Tributary to Brush Creek (HQ-CWF)	Stream Code	14178
NHD Com ID	65849449	RMI	0.34
Drainage Area	0.84 mi.^{2}	Yield (cfs/mi^2)	See comments below
Q_{7-10} Flow (cfs)	See comments below	Q_{7-10} Basis	USGS StreamStats
Elevation (ft)	1240	Slope (ft/ft)	
Watershed No.	11-C	Chapter 93 Class.	HQ-CWF
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	Saxton Borough Municipal Authority, Bedford County		
PWS Waters	Raystown Branch Juniata River	Flow at Intake (cfs)	
PWS RMI	42.5 miles	Distance from Outfall (mi)	Approximate 52 miles

Changes Since Last Permit Issuance:

Drainage Area
The discharge is to Unnamed Tributary (14334) to Brush Creek (14178) at RMI 0.34 mile. A drainage area upstream of the discharge is estimated to be 0.84 mi.^{2}, according to USGS PA StreamStats available at https://streamstats.usgs.gov/ss/.

Streamflow
There are no nearby stream gages with low flow data that have extensive or recent periods of record. Since USGS PA StreamStats estimated the drainage area that is below the minimum value allowed by USGS's regression equations, the USGS gage station No. 01565000 on Juniata River watershed located in Mifflin Borough will be used to calculate the Q_{7-10} at the point of discharge using a low flow yield method. The Q_{7-10} here is 336 cfs and the drainage area is 2,840 mi.^{2} which results in a Q_{7-10} low flow yield of 0.12 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):

$$\text{Low Flow Yield} = Q_{7-10gage} / \text{Drainage Area}_{gage} = 336 \text{ cfs} / 2840 \text{ mi.}^2 = 0.12 \text{ cfs/mi.}^2$$
$$Q_{7-10discharge} = 0.12 \text{ cfs/mi.}^2 * \text{Drainage Area}_{discharge} = 0.12 \text{ cfs/mi.}^2 * 0.84 \text{ mi.}^2 = 0.10 \text{ cfs}$$
$$Q_{30-10} = 1.36 * Q_{7-10discharge} = 1.36 * 0.1 \text{ cfs} = 0.136 \text{ cfs}$$
$$Q_{1-10} = 0.64 * Q_{7-10discharge} = 0.64 * 0.1 \text{ cfs} = 0.064 \text{ cfs}$$

Unnamed Tributary 14178 to Brush Creek
Under 25 Pa Code § 93.9n, the unnamed tributary to Brush Creek is designated as High Quality-Cold Water Fishes (HQ-CWF). However, the discharge has existed since 1970 and does not require compliance in HQ requirements until an expansion or upgrade would be requested.

Potable Water Supply Intake
The nearest downstream public water supply intake is the Saxton Borough Municipal Authority intake on the Raystown Branch Juniata River, Bedford County approximately 52 miles from the point of discharge. Given the nature and dilution, the discharge is not expected to significantly impact the water supply.

Treatment Facility Summary				
Treatment Facility Name: PA DOT - Rest Area 3 - I-70				
WQM Permit No.	**Issuance Date**			
2991402	2/26/1992			
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Secondary	Extended Aeration	Hypochlorite	
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.0065		Not Overloaded	Aerobic Digestion	Combination of methods

Changes Since Last Permit Issuance:

Other Comments:

The treatment process is as follows: Comminutor (1) - Bar Screen (1) – Equalization Tank (1) – Splitter Box (1) - Aeration Tanks (2) – Clarifiers (2) - Dosing Tank (1) – Sand Filters (4) - Chlorine Contact Tank (1) – Post Aeration Tank (1) – Sludge Holding Tank (1) - Discharge (Outfall to Unnamed Tributary to Brush Creek).

Magnesium hydroxide is used for alkalinity supplementation and sodium hypochlorite is used for disinfection. A sludge holding tank is used for solids storage.

Compliance History	
Summary of DMRs:	DMRs reported last 12 months are summarized in the next page.
Summary of Inspections:	9/26/2024: Mr. Clark, DEP Water Quality Specialist, conducted a compliance evaluation inspection. The effluent looks clear and field test results were within the permit limits. The facility needs to repair the composite sampler or start taking composite samples by hand. Effluent samples can be composited by hand by combining four different grab samples, taken every two hours, over an eight-hour period. The four individual grab times need to be recorded in the operations logbook. There was violation noted during the inspection such as failure to monitor pollutants as required by the NPDES permit (not collecting 8-hour composite sample).
Other Comments:	There are currently 5 open violations associated with the permittee or the facility. - 6/22/2022: three violations codes: 92A.41(A)8, 271.918, & 92A.41(A)12B. - 8/17/2023: one violation code 92A.44. - 9/26/2024: one violation code 92A.61(C).

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	0.01460	0.001646	0.002194	0.001985	0.001162	0.002349	0.001972	0.000872	0.001390	0.001544	0.001350	0.000952
Flow (MGD) Daily Maximum	0.003587	0.003948	0.003449	0.009159	0.002367	0.004653	0.003380	0.001391	0.002304	0.002271	0.003277	0.002146
pH (S.U.) Daily Minimum	6.2	7.1	6.9	7.2	7.1	7.2	7.3	7.2	7.1	7.3	7.1	7.5
pH (S.U.) Instantaneous Maximum	8.1	7.9	7.8	7.8	7.8	8.0	7.8	8.1	7.6	7.8	7.5	7.9
DO (mg/L) Daily Minimum	8.6	8.6	7.8	4.9	5.2	7.8	9.7	8.4	9.4	10.2	9.6	8.8
TRC (mg/L) Average Monthly	0.23	0.23	0.23	0.23	0.25	0.16	0.23	0.23	0.23	0.23	0.23	0.23
TRC (mg/L) Instantaneous Maximum	0.35	0.26	0.40	0.43	0.51	0.28	0.26	0.26	0.27	0.29	0.26	0.26
CBOD5 (mg/L) Average Monthly	< 5.5	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
TSS (mg/L) Average Monthly	2.2	6.8	< 1.6	< 3.4	< 2.8	< 1.6	2.4	< 2.4	4.6	< 3.2	< 1.6	< 3.0
Fecal Coliform (No./100 ml) Geometric Mean	< 1	3	< 1	< 1	< 2	1773	< 5	< 3	< 1	< 1	26	328
Fecal Coliform (No./100 ml) Instantaneous Maximum	< 1	6	< 1	< 1	< 4	2420	21	9	< 1	< 1	689	579
Total Nitrogen (lbs/day) Total Annual												< 0.405
Total Nitrogen (mg/L) Annual Average												< 41.59
Ammonia (mg/L) Average Monthly	< 0.56	0.68	< 0.10	< 0.21	< 0.71	< 0.10	< 0.10	< 0.27	< 0.16	< 0.10	< 0.10	< 0.10
Total Phosphorus (lbs/day) Total Annual												0.023

Total Phosphorus (mg/L) Annual Average												2.34

Existing Effluent Limitations and Monitoring Requirements

Outfall 001,

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Maximum	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
TRC	XXX	XXX	XXX	0.23	XXX	0.74	1/day	Grab
$CBOD_5$	XXX	XXX	XXX	25	XXX	50	2/month	8-Hr Composite
TSS	XXX	XXX	XXX	30	XXX	60	2/month	8-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2,000 Geo Mean	XXX	10,000	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	2/month	Grab
Ammonia Nov 1 - Apr 30	XXX	XXX	XXX	21	XXX	42	2/month	8-Hr Composite
Ammonia May 1 - Oct 31	XXX	XXX	XXX	7.0	XXX	14	2/month	8-Hr Composite
Total Nitrogen	XXX	Report Total Annual	XXX	Report Annl Avg	XXX	XXX	1/year	Calculation
Total Phosphorus	XXX	Report Total Annual	XXX	Report Annl Avg	XXX	XXX	1/year	8-Hr Composite

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.0065
Latitude 39º 55' 22.40" **Longitude** -78º 14' 8.34"
Wastewater Description: Sewage Effluent

Technology-Based Limitations

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

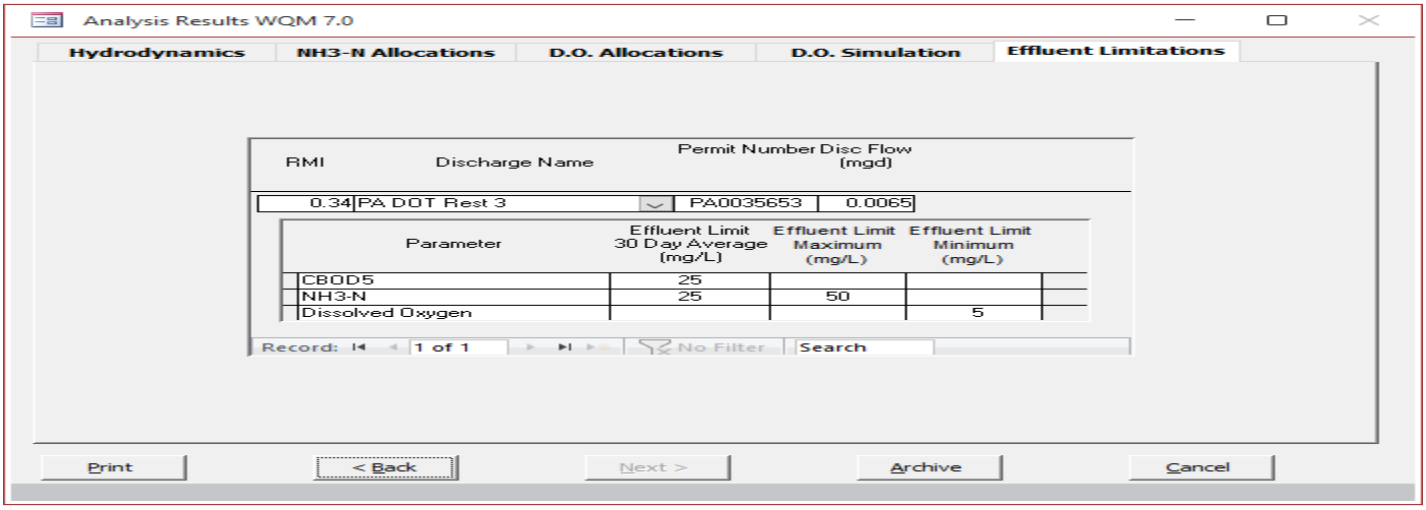
Pollutant	Limit (mg/l)	SBC	Federal Regulation	State Regulation
$CBOD_5$	25	Average Monthly	133.102(a)(4)(i)	92a.47(a)(1)
	40	Average Weekly	133.102(a)(4)(ii)	92a.47(a)(2)
Total Suspended Solids	30	Average Monthly	133.102(b)(1)	92a.47(a)(1)
	45	Average Weekly	133.102(b)(2)	92a.47(a)(2)
pH	6.0 – 9.0 S.U.	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:

Water Quality-Based Limitations

Ammonia (NH_3-N):
NH_3-N calculations were first 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 computer model of the stream:

- Discharge pH = 7.0 (Default)
- Discharge Temperature = 25^{0}C (Default)
- Stream pH = 7.0 (Default)
- Stream Temperature = 20^{0}C (Default)
- Background NH_3-N = 0 (Default)



The printout of the WQM 7.0 output indicates that at a discharge of 0.0065 MGD, limits (rounded according to the NPDES Technical Guidance 362-0400-001) of 25.0 mg/L NH_3-N as a monthly average and 50.0 mg/L NH_3-N instantaneous maximum are necessary to protect the aquatic life from toxicity effects. Winter limit is 3 times the summer limit. Therefore, the existing summer limits 7.0 mg/L AML & 14.0 mg/L IMAX are more stringent and will remain in the proposed permit.

Carbonaceous Biochemical Oxygen Demand ($CBOD_5$):
Only the minimum treatment requirements of secondary treatment will be necessary to protect water quality. The existing limits of 25.0 mg/L average monthly and 50.0 mg/L instantaneous maximum will remain in the renewal permit. Past DMRs and inspection reports show that the facility has been consistently achieving concentrations under these limits.

Dissolved Oxygen (D.O.):
A minimum D.O. of 5.0 mg/L is required per 25 Pa. Code § 93.7. This is consistent with the previous permit and current Department criteria.

Total Suspended Solids (TSS):
The existing limits of 30.0 mg/L average monthly and 60.0 mg/L instantaneous maximum will remain in the renewal permit based on the minimum level of effluent quality attainable by secondary treatment based on 25 Pa. Code § 92a.47. Past DMRs and inspection reports show that the facility has been consistently achieving concentrations under these limits.

pH:
The effluent discharge pH should remain above 6 and below 9 standard units according to 25 Pa. Code § 95.2(2).

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 1,000/100 ml and 25 Pa Code § 92a.47.(a)(5) requires a winter limit of 2,000/100 ml as a geometric mean and an instantaneous maximum not greater than 10,000/100 ml.

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/year will be included in the permit to be consistent with the recommendation from this SOP.

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 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, will be required to monitor and report TP and TN once a year.

Toxic:
This is a minor sewage facility receiving domestic wastewater only and the current application does not require sampling of toxic pollutants (or heavy metals) for those facilities with design flows less than 0.1 MGD. Therefore, no reasonable potential analysis for toxic pollutants has been performed for this permit renewal.

Total Residual Chlorine (TRC):
Based on the attached TRC Excel Spreadsheet calculator, which uses the equations and calculations from the Department's May 1, 2003 Implementation Guidance for Total Residual Chlorine (ID No. 391-2000-015), indicated a monthly average limit of 0.5 mg/L and an instantaneous maximum limit of 1.64 mg/L. Therefore, the existing limits 0.23 mg/L AML & 0.74 mg/L IMAX were more stringent and will remain in the proposed permit. Based on the DMRs from the past year, the facility has been consistently achieving this limit.

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

0.1	= Q stream (cfs)	0.5	= CV Daily
0.0065	= Q discharge (MGD)	0.5	= CV Hourly
30	= no. samples	1	= AFC_Partial Mix Factor
0.3	= Chlorine Demand of Stream	1	= CFC_Partial Mix Factor
0	= Chlorine Demand of Discharge	15	= AFC_Criteria Compliance Time (min)
0.5	= BAT/BPJ Value	720	= CFC_Criteria Compliance Time (min)
0	= % Factor of Safety (FOS)		=Decay Coefficient (K)

Source	Reference	AFC Calculations	Reference	CFC Calculations
TRC	1.3.2.iii	WLA afc = 3.191	1.3.2.iii	WLA cfc = 3.104
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 1.189	5.1d	LTA_cfc = 1.804

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

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

Additional Consideration

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

Monitoring Frequency and Sample Type
The facility currently is required to collect daily effluent grab samples for D.O., TRC, and pH; bi-monthly effluent 8-hr composite samples of $CBOD_5$, TSS, and ammonia-nitrogen; bi-monthly effluent grab samples of fecal coliform, annually effluent 8-hr composite samples of TP; and annually effluent calculation samples of TN. Based on the best professional judgement of the author, the existing monitoring frequencies are sufficient and necessary. Therefore, the renewal permit monitoring frequencies will remain the same as those specified in the existing permit.

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. No Exceptional Value Waters are impacted by this discharge.

303d Listed Streams
This discharge is not located on a 303d listed stream segment.

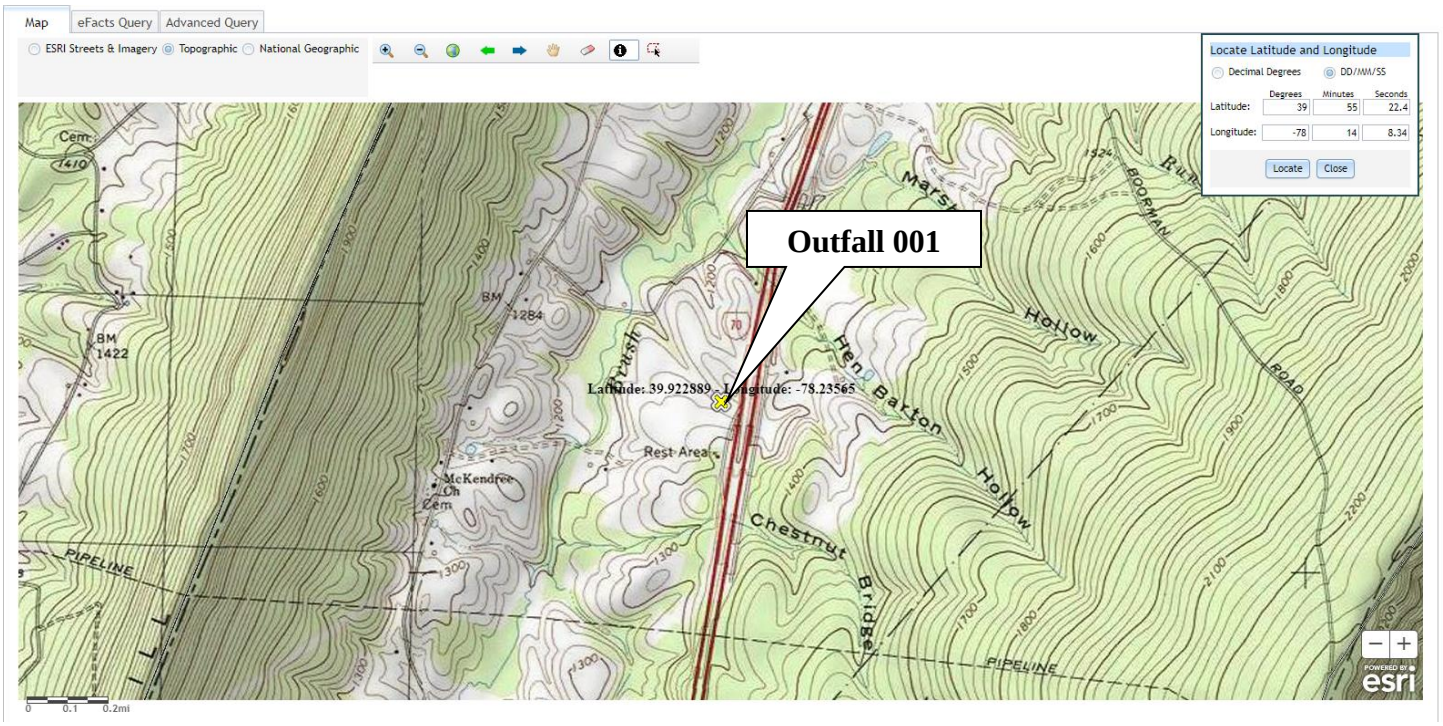
Class A Wild Trout Fisheries
No Class A Wild Trout Fisheries are impacted by this discharge.

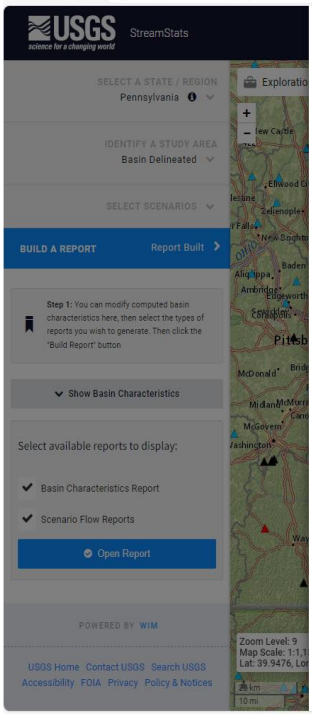
Anti-Backsliding

Unless stated otherwise in this fact sheet, all permit requirements proposed in this fact sheet are at least as stringent as existing permit requirements in accordance with 40 CFR §122.44(l)(1).

- Discharge pH = 7 (Default)
- Discharge Temperature = 25^{0}C (Default)
- Stream pH = 7.0 (Default)
- Stream Temperature = 20^{0}C (Default)
- Background NH_3-N = 0 (Default)

1. Outfall 001 on Unnamed Trib (14334) to Brush Creek (14178)
    a. Elevation: 1240 ft
    b. RMI: 0.34 mile
    c. Drainage Area: 0.84 mi.^{2}
    d. Low Flow Yield: 0.12 cfs/mi.^{2}
    e. Discharge Flow: 0.0065 MGD
2.
    a. Elevation: 1170 ft
    b. RMI: 0.10 mile
    c. Drainage Area: 0.93 mi.^{2}
    d. Low Flow Yield: 0.12 cfs/mi.^{2}
    e. Discharge Flow: 0.000 MGD.





Parameter Code	Parameter Description	Value	Unit
CARBON	Percentage of area of carbonate rock	18.67	percent
DRNAREA	Area that drains to a point on a stream	2840	square miles
PRECIP	Mean Annual Precipitation	39	inches
ROCKDEP	Depth to rock	4.5	feet
STRDEN	Stream Density -- total length of streams divided by drainage area	1.94	miles per square mile

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region 2]

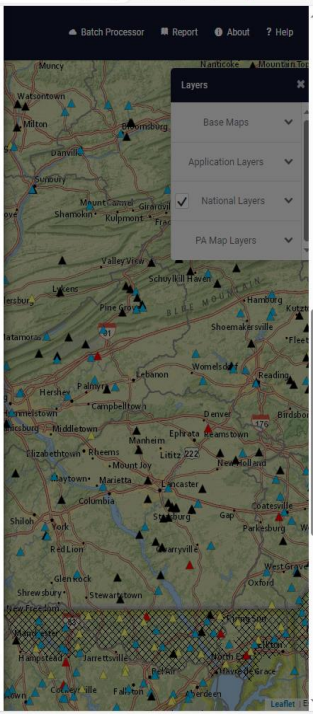
Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	2840	square miles	4.93	1280
PRECIP	Mean Annual Precipitation	39	inches	35	50.4
STRDEN	Stream Density	1.94	miles per square mile	0.51	3.1
ROCKDEP	Depth to Rock	4.5	feet	3.32	5.65
CARBON	Percent Carbonate	18.67	percent	0	99

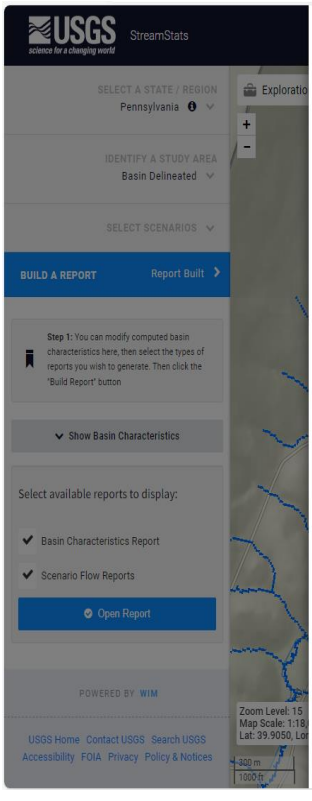
Low-Flow Statistics Disclaimers [Low Flow Region 2]

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 2]

Statistic	Value	Unit
7 Day 2 Year Low Flow	504	ft^3/s
30 Day 2 Year Low Flow	609	ft^3/s
7 Day 10 Year Low Flow	336	ft^3/s
30 Day 10 Year Low Flow	407	ft^3/s
90 Day 10 Year Low Flow	521	ft^3/s





Parameter Code	Parameter Description	Value	Unit
CARBON	Percentage of area of carbonate rock	0	percent
DRNAREA	Area that drains to a point on a stream	0.84	square miles
PRECIP	Mean Annual Precipitation	40	inches
ROCKDEP	Depth to rock	4.5	feet
STRDEN	Stream Density -- total length of streams divided by drainage area	1.26	miles per square mile

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region 2]

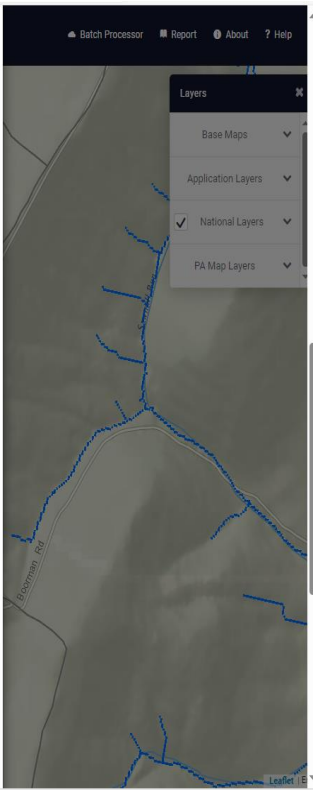
Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.84	square miles	4.93	1280
PRECIP	Mean Annual Precipitation	40	inches	35	50.4
STRDEN	Stream Density	1.26	miles per square mile	0.51	3.1
ROCKDEP	Depth to Rock	4.5	feet	3.32	5.65
CARBON	Percent Carbonate	0	percent	0	99

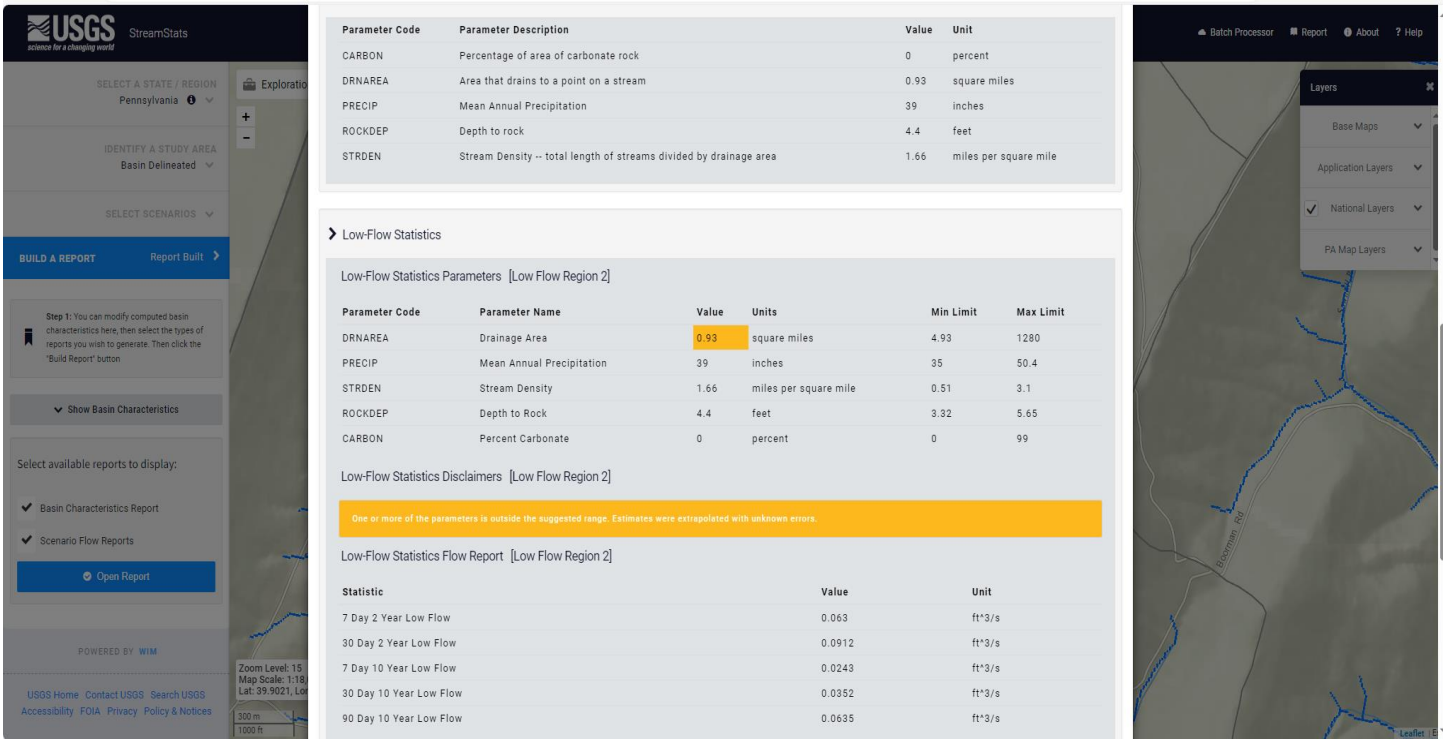
Low-Flow Statistics Disclaimers [Low Flow Region 2]

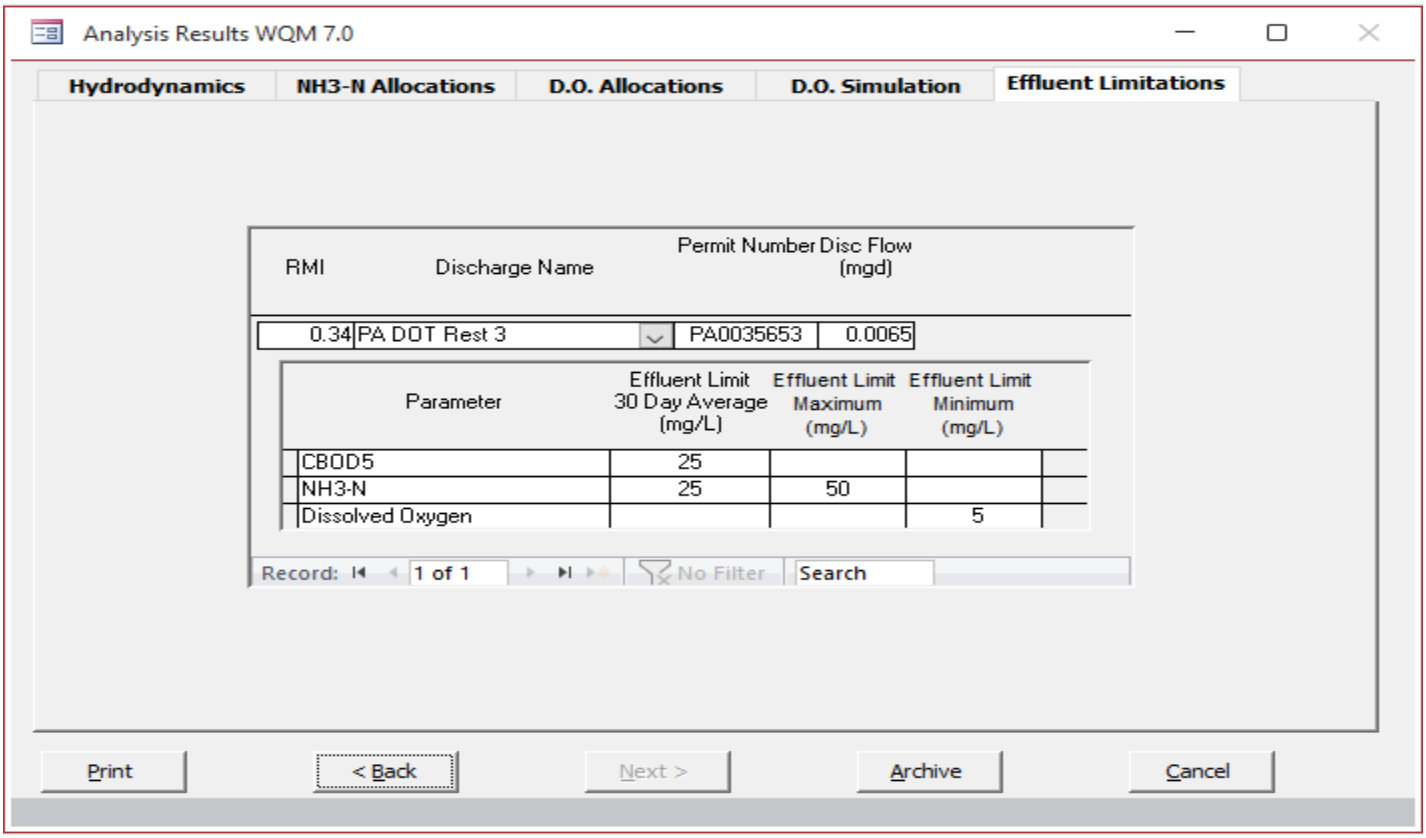
One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Low-Flow Statistics Flow Report [Low Flow Region 2]

Statistic	Value	Unit
7 Day 2 Year Low Flow	0.0832	ft^3/s
30 Day 2 Year Low Flow	0.117	ft^3/s
7 Day 10 Year Low Flow	0.0338	ft^3/s
30 Day 10 Year Low Flow	0.0476	ft^3/s
90 Day 10 Year Low Flow	0.0835	ft^3/s




USGS StreamStats
SELECT A STATE / REGION
Pennsylvania
IDENTIFY A STUDY AREA
Basin Delineated
SELECT SCENARIOS
BUILD A REPORT
Report Built
Show Basin Characteristics
Select available reports to display:
Basin Characteristics Report
Scenario Flow Reports
Open Report
Parameter Code | Parameter Description | Value | Unit
CARBON | Percentage of area of carbonate rock | 0 | percent
DRNAREA | Area that drains to a point on a stream | 0.93 | square miles
PRECIP | Mean Annual Precipitation | 39 | inches
ROCKDEP | Depth to rock | 4.4 | feet
STRDEN | Stream Density -- total length of streams divided by drainage area | 1.66 | miles per square mile
Low-Flow Statistics
Low-Flow Statistics Parameters [Low Flow Region 2]
Parameter Code | Parameter Name | Value | Units | Min Limit | Max Limit
DRNAREA | Drainage Area | 0.93 | square miles | 4.93 | 1280
PRECIP | Mean Annual Precipitation | 39 | inches | 35 | 50.4
STRDEN | Stream Density | 1.66 | miles per square mile | 0.51 | 3.1
ROCKDEP | Depth to Rock | 4.4 | feet | 3.32 | 5.65
CARBON | Percent Carbonate | 0 | percent | 0 | 99
Low-Flow Statistics Disclaimers [Low Flow Region 2]
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 2]
Statistic | Value | Unit
7 Day 2 Year Low Flow | 0.063 | ft^3/s
30 Day 2 Year Low Flow | 0.0912 | ft^3/s
7 Day 10 Year Low Flow | 0.0243 | ft^3/s
30 Day 10 Year Low Flow | 0.0352 | ft^3/s
90 Day 10 Year Low Flow | 0.0635 | ft^3/s
Batch Processor
Report
About
Help
Layers
Base Maps
Application Layers
National Layers
PA Map Layers


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)
0.34
PA DOT Rest 3
PA0035653
0.0065
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
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Cancel

rptEffLimits

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
11C	14178	BRUSH 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)
0.340	PA DOT Site 3	PA0035653	0.007	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
11C	14178	BRUSH 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
0.340	PA DOT Site 3	15.85	50	15.85	50	0	0

NH3-N Chronic Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
0.340	PA DOT Site 3	1.65	25	1.65	25	0	0

Dissolved Oxygen Allocations

RMI	Discharge Name	CBOD5 Baseline (mg/L)	CBOD5 Multiple (mg/L)	NH3-N Baseline (mg/L)	NH3-N Multiple (mg/L)	Dissolved Oxygen Baseline (mg/L)	Dissolved Oxygen Multiple (mg/L)	Critical Reach	Percent Reduction
0.34	PA DOT Site 3	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
11C	14178	BRUSH CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
0.340	0.007	20.454	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WD Ratio**	**Reach Velocity (fps)**
3.724	0.383	9.728	0.078
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
1.09	0.779	2.27	0.725
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.919	23.409	Owens	5
Reach Travel Time (days)			
0.189			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.019	4.03	2.24	8.17
0.038	3.97	2.21	8.17
0.057	3.91	2.18	8.17
0.075	3.85	2.15	8.17
0.094	3.79	2.12	8.17
0.113	3.73	2.09	8.17
0.132	3.68	2.06	8.17
0.151	3.62	2.03	8.17
0.170	3.57	2.01	8.17
0.189	3.52	1.98	8.17

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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	1.36	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
11C	14178	BRUSH 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												
0.340	0.10	0.00	0.10	.0101	0.0552M	.383	3.72	9.73	0.08	0.169	20.45	7.00
Q1-10 Flow												
0.340	0.06	0.00	0.06	.0101	0.0552M	NA	NA	NA	0.06	0.256	20.67	7.00
Q30-10 Flow												
0.340	0.14	0.00	0.14	.0101	0.0552M	NA	NA	NA	0.09	0.101	20.34	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
11C	14178	BRUSH CREEK	0.340	1260.00	0.64	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfs/m)	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	0.120	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
PA DOT Site 3	PA0035653	0.0065	0.0065	0.0065	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
11C	14178	BRUSH CREEK	0.100	1170.00	0.93	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfs/m)	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	0.120	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
PA DOT Site 3	PA0035653	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

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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	Average Weekly	Minimum	Average Monthly	Maximum	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
TRC	XXX	XXX	XXX	0.23	XXX	0.74	1/day	Grab
$CBOD_5$	XXX	XXX	XXX	25.0	XXX	50.0	2/month	8-Hr Composite
TSS	XXX	XXX	XXX	30.0	XXX	60.0	2/month	8-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2,000 Geo Mean	XXX	10,000	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	2/month	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/year	Grab
Ammonia Nov 1 - Apr 30	XXX	XXX	XXX	21.0	XXX	42.0	2/month	8-Hr Composite
Ammonia May 1 - Oct 31	XXX	XXX	XXX	7.0	XXX	14.0	2/month	8-Hr Composite
Total Nitrogen	XXX	Report Total Annual	XXX	Report Annl Avg	XXX	XXX	1/year	Calculation
Total Phosphorus	XXX	Report Total Annual	XXX	Report Annl Avg	XXX	XXX	1/year	8-Hr Composite

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: