

Application Type

Renewal

Facility Type

Non-Municipal

Major / Minor

Minor

Application No.

PA0035602

APS ID

1103691

Authorization ID

1467167

**NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE**

Applicant and Facility Information

Applicant Name	<u>PA DOT Bureau of Project Delivery</u>	Facility Name	<u>PA DOT Site 36 I 80 West Rest Area</u>
Applicant Address	<u>400 North Street 6th Floor</u>	Facility Address	<u>Safety Rest Area Site No 36</u>
	<u>Harrisburg, PA 17120</u>		<u>Danville, PA 17554</u>
Applicant Contact	<u>Nicholaus Sahd</u>	Facility Contact	<u>Nicholaus Sahd</u>
Applicant Phone	<u>(717) 886-5395</u>	Facility Phone	<u>(717) 886-5395</u>
Client ID	<u>62162</u>	Site ID	<u>262328</u>
Ch 94 Load Status	<u>Not Overloaded</u>	Municipality	<u>Liberty Township</u>
Connection Status	<u>No Limitations</u>	County	<u>Montour</u>
Date Application Received	<u>January 2, 2024</u>	EPA Waived?	<u>Yes</u>
Date Application Accepted	<u>January 17, 2024</u>	If No, Reason	
Purpose of Application	<u>Application for the renewal of the existing individual NPDES permit.</u>		

Summary of Review

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
X		 Jonathan P. Peterman / Project Manager	March 7, 2025
X		 Nicholas W. Hartranft, P.E. / Environmental Engineer Manager	March 10, 2025

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	001	Design Flow (MGD)	0.007
Latitude	40° 59' 22.67"	Longitude	-76° 43' 44.39"
Quad Name	Riverside	Quad Code	1132
Wastewater Description:	Sewage Effluent		
Receiving Waters	Unnamed Tributary of Beaver Run (WWF)	Stream Code	18739
NHD Com ID	66919867	RMI	0.4100
Drainage Area	n/a	Yield (cfs/mi ²)	n/a
Q ₇₋₁₀ Flow (cfs)	0	Q ₇₋₁₀ Basis	Intermittent stream
Elevation (ft)	600	Slope (ft/ft)	n/a
Watershed No.	10-D	Chapter 93 Class.	WWF, MF
Existing Use	WWF	Existing Use Qualifier	n/a
Exceptions to Use	None	Exceptions to Criteria	None
Assessment Status	Impaired		
Cause(s) of Impairment	SILTATION		
Source(s) of Impairment	AGRICULTURE		
TMDL Status	Name		
Nearest Downstream Public Water Supply Intake	Sunbury Municipal Authority		
PWS Waters	Susquehanna River	Flow at Intake (cfs)	1740
PWS RMI	124	Distance from Outfall (mi)	17.5

Changes Since Last Permit Issuance: None.

Other Comments: No modeling was previously conducted for this facility. However, discharge should be evaluated to ensure that the effluent limits are protective of water quality where the effluent meets Beaver Run. The Q₇₋₁₀ calculations, for this stream are attached in Appendix A.

Chesapeake Bay Requirements

Since this facility's annual average design flow is 0.007 MGD, the permittee was required to monitor and report TN and TP throughout the permit term at a frequency no less than annually in accordance with the Phase III WIP Chesapeake Bay Strategy for Phase V facilities (0.002 MGD to 0.2 MGD) unless 1) the facility has already conducted at least two years of nutrient monitoring and 2) a summary of the monitoring results are included in the next permit's fact sheet. During previous permit cycles, the required sampling was conducted. Since the permittee conducted this monitoring in a previous permit term and the data is summarized in the fact sheet below, the conditions have been met and Chesapeake Bay monitoring will not be required.

Parameter	Instantaneous Maximum (mg/l)	Total Annual (lbs)
Total Nitrogen (TN)	108	460
Total Phosphorus (TP)	5.0	21

Anti-Backsliding

In accordance with 40 CFR 122.44(l)(1) and (2), this permit does not contain effluent limitations, standards, or conditions that are less stringent than the previous permit.

Treatment Facility Summary

Treatment Facility Name: PA DOT - Rest Area 36 - I-80 West

WQM Permit No.	Issuance Date	Comments
4790402 A-1	4/19/2022	Replacement of existing tablet chlorinator with a new liquid sodium hypochlorite feed.
4790402	1/28/1991	Original construction.

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Tertiary	Activated Sludge With Solids Removal	Hypochlorite	0.007
0.007	--	Not Overloaded	Aerobic Digestion	Other WWTP

Treatment System Components:

- One (1) Equalization Tank with Manual Screen.
- One (1) Splitter Box.
- Two (2) Aeration Tanks.
- Two (2) Clarifiers.
- One (1) Dosing Tank.
- Two (2) Sand Filters.
- One (1) Chlorine Disinfection System.
- One (1) Chlorine Contact Tank.
- One (1) Flow Meter.
- One (1) Outfall 001.
- One (1) Aerobic Digester.

Existing Effluent Limitations and Monitoring Requirements

Existing Limits

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	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Metered
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	9.0	XXX	1/day	Grab
Dissolved Oxygen	XXX	XXX	Report Daily Min	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.5	1.6	XXX	1/day	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	XXX	XXX	XXX	10.0	20.0	XXX	2/month	Grab
Total Suspended Solids	XXX	XXX	XXX	10.0	20.0	XXX	2/month	Grab
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/month	Grab

*The existing effluent limits for Outfall 001 were based on a design flow of 0.007 MGD.

Development of Effluent Limitations

Outfall No. 001
Latitude 40° 59' 22.67"
Wastewater Description: Sewage Effluent

Design Flow (MGD) 0.007
Longitude -76° 43' 44.39"

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	10,000 / 100 ml	IMAX	-	92a.47(a)(5)

(10/1 – 4/30)				
Total Residual Chlorine	0.5	Average Monthly	-	92a.48(b)(2)

Water Quality-Based Limitations

To establish whether or not water-quality based effluent limitations (WQBELs) are required, the Department models in-stream conditions. In order to determine limitations for CBOD₅, ammonia-N and dissolved oxygen, the Department utilizes the WQM 7.0 v1.0b model and in order to determine limitations for toxics, the Department utilizes Toxics Management Spreadsheet (TMS). The TMS was not utilized or this review.

WQM 7.0 for Windows, Version 1.0b, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen

The model was run using the Q7-10 stream flow, background water quality, average annual design flow, and other discharge characteristics. The existing technology based effluent limit (advanced treatment standards) for CBOD₅ (10 mg/l) and the technology-based effluent limits for NH₃-N (25.0 mg/l) were used as inputs for the modeling. The DO minimum daily average criterion from §93.7 (5.0 mg/L for WWF) was used for the in-stream objective for the model. The summary of the output is as follows:

Parameter	Effluent Limit		
	30 Day Average	Maximum	Minimum
CBOD5	10	N/A	N/A
Ammonia-N	25	50	N/A
Dissolved Oxygen	N/A	N/A	3

The model did not recommend water-quality based effluent limitations with regards to CBOD₅, ammonia, and dissolved oxygen. Refer to the Appendix B for the previous WQM 7.0 inputs and results. The existing effluent limits will remain.

Best Professional Judgment (BPJ) Limitations

See the D.O. section below.

Comments: None.

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 the abovementioned technology, water quality, and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (362-0400-001) 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	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Metered
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	9.0	XXX	1/day	Grab
Dissolved Oxygen	XXX	XXX	Report Daily Min	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.5	1.6	XXX	1/day	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	XXX	XXX	XXX	10.0	20.0	XXX	2/month	Grab

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	Daily Maximum	Instant. Maximum		
Total Suspended Solids	XXX	XXX	XXX	10.0	20.0	XXX	2/month	Grab
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/month	Grab
Ammonia-Nitrogen	XXX	XXX	XXX	Report	XXX	Report	2/month	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/year	Grab

*The proposed effluent limits for Outfall 001 were based on a design flow of 0.007 MGD.

General Information

All of the limits proposed above are consistent with other permits issued for wastewater treatment plants in the region. The associated mass-based limits (lbs/day) for all parameters were based on the formula: design flow (average annual) (MGD) x concentration limit (mg/L) at design flow x conversion factor (8.34). All effluent limits were then rounded down in accordance with the rounding rules established in the *Technical Guidance for the Development and Specification of Effluent Limitations* (362-0400-001), Chapter 5 - Specifying Effluent Limitations in NPDES Permits.

Flow

Reporting of the average monthly flow and daily maximum is consistent with monitoring requirements for other treatment plants of this size.

Carbonaceous Biochemical Oxygen Demand (CBOD₅)

The results of the WQM 7.0 model show that the existing advanced treatment requirements for CBOD₅ as stipulated in the *Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers* (391-2000-014) are protective of water quality and will remain.

Total Suspended Solids (TSS)

The previously applied advanced treatment requirements stipulated in the *Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers* (391-2000-014) for TSS will remain as well.

pH

CFR Title 40 §133.102(c) and 25 PA Code §95.2(1) provide the basis of effluent limitations for pH. The existing limits will remain.

Total Residual Chlorine (TRC)

In accordance with 25 Pa. Code 92a.48(b)(2), a best available technology (BAT) value of 0.5 mg/l was used in the TRC Spreadsheet. This is also the existing effluent limit. The attached TRC model indicates that the technology based effluent limit of 0.5 mg/L (Average Monthly) and 1.6 mg/L (Instantaneous Maximum) are still protective of water quality and will remain.

Fecal Coliforms

The existing fecal coliform limits with I-max limits were updated from the previous Chapter 92 code to correspond with what is specified in the updated 25 PA Code § 92a.47 (a)(4)&(5).

Dissolved Oxygen (DO)

Given results of the WQM 7.0 model, a discharge of effluent from this facility with a DO concentration of 3 mg/l would not result in an exceedance of water quality requirements for this stream. Therefore, based on BPJ, only monitoring will be required for this facility.

Ammonia-Nitrogen (NH3-N)

The results of the WQM 7.0 model show that the technology based effluent limits for ammonia-nitrogen are protective of water quality. Therefore, the permittee will only be required to monitor for ammonia-nitrogen. The sample type (Grab) for NH3-N corresponds with the *Technical Guidance for the Development and Specification of Effluent Limitations* (362-0400-001) Table 6-3.

E. Coli

25 PA Code § 92a.61 provide the basis of monitoring requirements for E. Coli. Yearly monitoring will be required going forward.

Compliance History

Summary of Inspections -The last inspection of the facility was conducted on 2/25/25 by the Department. This inspection revealed no issues with the facility.

WMS Query Summary - A WMS Query was run at *Reports - Violations & Enforcements – Open Violations for Client Report* to determine whether there are any unresolved violations associated with the client that will affect issuance of the permit (per CSL Section 609). This query revealed no open violations.

eDMRs Summary - Upon review of the eDMR results the facility has been operating within the required effluent limits.

Compliance History

DMR Data for Outfall 001 (from February 1, 2024 to January 31, 2025)

Parameter	JAN-25	DEC-24	NOV-24	OCT-24	SEP-24	AUG-24	JUL-24	JUN-24	MAY-24	APR-24	MAR-24	FEB-24
Flow (MGD)	0.00045	0.00077		0.00027	0.00138	0.00293	0.00136	0.00127	0.00137	0.00091	0.00133	0.00079
Average Monthly	9	4	0.00065	5	04	6	6	9	3	8	4	2
Flow (MGD)	0.00095	0.00180	0.00142	0.00101	0.00190	0.00654	0.00269	0.00463	0.00415	0.00676		0.00196
Daily Maximum	2	0	4	8	4	6	8	8	1	1	0.00365	3
pH (S.U.)												
Daily Minimum	7.8	7.9	7.9	7.8	7.8	7.6	7.5	7.4	7.5	7.6	7.6	7.7
pH (S.U.)												
Daily Maximum	8.0	8.1	8.0	8.0	7.9	7.8	7.8	7.8	7.9	7.9	7.9	7.9
DO (mg/L)												
Daily Minimum	10.79	10.54	9.13	8.38	7.99	7.42	7.4	7.59	7.43	9.33	9.31	10.84
TRC (mg/L)												
Average Monthly	0.13	0.10	0.06	0.06	0.04	0.04	0.04	0.05	0.06	0.05	0.08	0.11
TRC (mg/L)												
Daily Maximum	0.28	0.16	0.10	0.11	0.06	0.08	0.06	0.09	0.08	0.12	0.15	0.15
CBOD5 (mg/L)												
Average Monthly	< 3.00	< 3.00	< 3.00	< 3.00	< 3.00	< 3.00	< 3.00	3.79	3.24	3.00	< 3.00	< 3.00
CBOD5 (mg/L)												
Daily Maximum	< 3.00	< 3.00	< 3.00	< 3.00	< 3.00	< 3.00	< 3.00	4.58	3.48	3.00	< 3.00	< 3.00
TSS (mg/L)												
Average Monthly	3.60	< 1.60	4.00	3.60	2.00	< 1.60	< 1.60	< 1.60	2.2	2.20	3.8	2.00
TSS (mg/L)												
Daily Maximum	3.60	1.60	4.80	5.60	2.40	< 1.60	1.60	< 1.60	2.8	2.80	6.00	2.40
Fecal Coliform (No./100 ml)												
Geometric Mean	< 1.00	< 1.0	< 1.00	< 1.00	< 1.00	2.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
Fecal Coliform (No./100 ml)												
Instantaneous Maximum	< 1.00	< 1.0	< 1.00	< 1.00	< 1.00	5.2	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00

Tools and References Used to Develop Permit	
<input checked="" type="checkbox"/>	WQM for Windows Model (see Attachment B)
<input type="checkbox"/>	Toxics Management Spreadsheet (see Attachment)
<input checked="" type="checkbox"/>	TRC Model Spreadsheet (see Attachment C)
<input type="checkbox"/>	Temperature Model Spreadsheet (see Attachment)
<input type="checkbox"/>	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
<input checked="" type="checkbox"/>	Technical Guidance for the Development and Specification of Effluent Limitations, 386-0400-001, 10/97.
<input type="checkbox"/>	Policy for Permitting Surface Water Diversions, 386-2000-019, 3/98.
<input checked="" type="checkbox"/>	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 386-2000-018, 11/96.
<input type="checkbox"/>	Technology-Based Control Requirements for Water Treatment Plant Wastes, 386-2183-001, 10/97.
<input type="checkbox"/>	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 386-2183-002, 12/97.
<input type="checkbox"/>	Pennsylvania CSO Policy, 386-2000-002, 9/08.
<input type="checkbox"/>	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
<input type="checkbox"/>	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 386-2000-008, 4/97.
<input type="checkbox"/>	Determining Water Quality-Based Effluent Limits, 386-2000-004, 12/97.
<input type="checkbox"/>	Implementation Guidance Design Conditions, 386-2000-007, 9/97.
<input checked="" type="checkbox"/>	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.
<input type="checkbox"/>	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 386-2000-012, 10/1997.
<input type="checkbox"/>	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 386-2000-009, 3/99.
<input type="checkbox"/>	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 386-2000-015, 5/2004.
<input type="checkbox"/>	Implementation Guidance for Section 93.7 Ammonia Criteria, 386-2000-022, 11/97.
<input type="checkbox"/>	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 386-2000-013, 4/2008.
<input checked="" type="checkbox"/>	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 386-2000-011, 11/1994.
<input type="checkbox"/>	Implementation Guidance for Temperature Criteria, 386-2000-001, 4/09.
<input type="checkbox"/>	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 386-2000-021, 10/97.
<input type="checkbox"/>	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.
<input type="checkbox"/>	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 386-2000-005, 3/99.
<input type="checkbox"/>	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.
<input checked="" type="checkbox"/>	Design Stream Flows, 386-2000-003, 9/98.
<input type="checkbox"/>	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.
<input type="checkbox"/>	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 386-3200-001, 6/97.
<input checked="" type="checkbox"/>	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
<input type="checkbox"/>	SOP:
<input type="checkbox"/>	Other:

APPENDIX A

Q7-10 ANALYSIS AND STREAM DATA

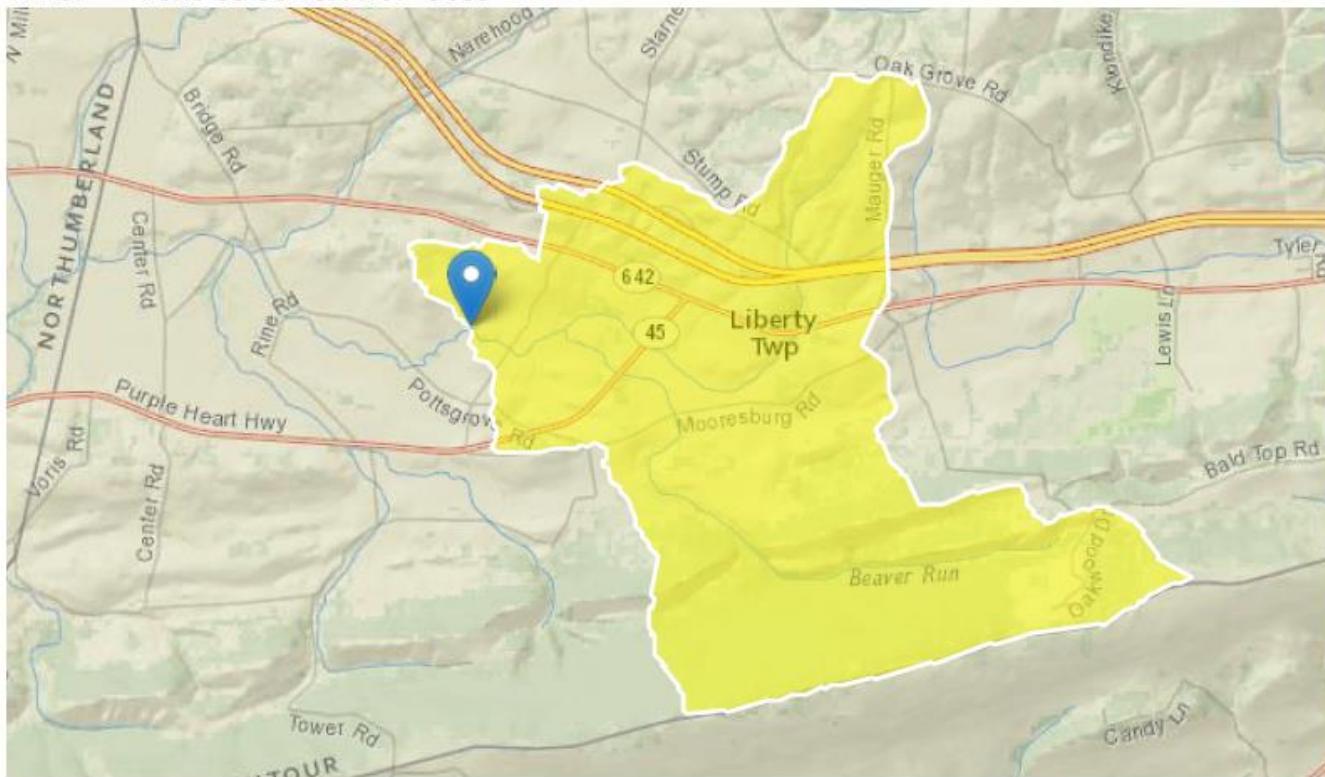
StreamStats Report

Region ID: PA

Workspace ID: PA20250306185526158000

Clicked Point (Latitude, Longitude): 40.98257, -76.74386

Time: 2025-03-06 13:55:59 -0500



[Collapse All](#)

► Basin Characteristics

Parameter	Code	Parameter Description	Value	Unit
CARBON		Percentage of area of carbonate rock	7.88	percent
DRNAREA		Area that drains to a point on a stream	4.69	square miles
PRECIP		Mean Annual Precipitation	41	inches
ROCKDEP		Depth to rock	3.9	feet
STRDEN		Stream Density -- total length of streams divided by drainage area	2.24	miles per square mile

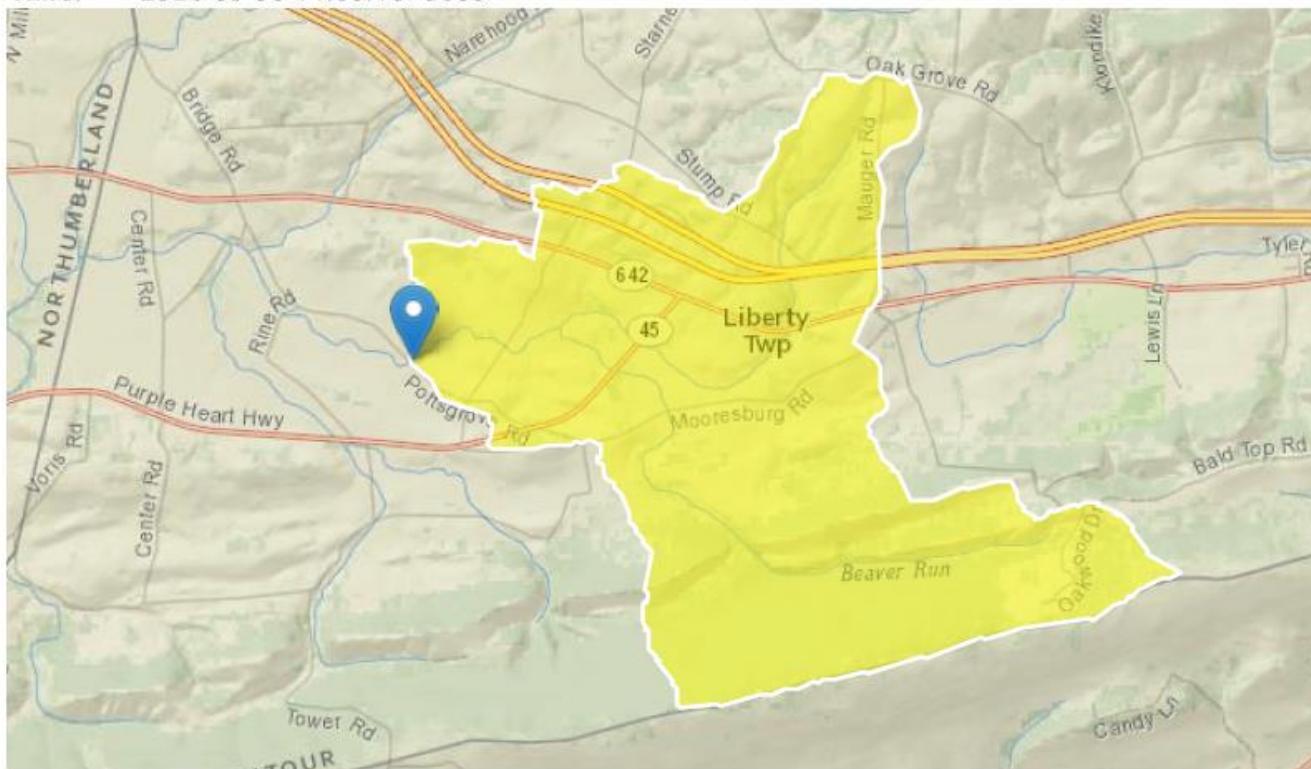
StreamStats Report

Region ID: PA

Workspace ID: PA20250306185952517000

Clicked Point (Latitude, Longitude): 40.98017, -76.74886

Time: 2025-03-06 14:00:18 -0500



 [Collapse All](#)

➤ Basin Characteristics

Parameter

Code	Parameter Description	Value	Unit
CARBON	Percentage of area of carbonate rock	7.68	percent
DRNAREA	Area that drains to a point on a stream	4.81	square miles
PRECIP	Mean Annual Precipitation	41	inches
ROCKDEP	Depth to rock	3.8	feet
STRDEN	Stream Density -- total length of streams divided by drainage area	2.28	miles per square mile

APPENDIX B

WQM 7.0 MODEL INPUT/OUTPUT

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation	Drainage Area	Slope	PWS Withdrawal	Apply FC
				(ft)	(sq mi)	(ft/ft)	(mgd)	
10D	18739	Trib 18739 to Beaver Run	2.510	498.00	4.69	0.00000	0.00	<input checked="" type="checkbox"/>

Stream Data

Design Cond.	LFY	Trib Flow	Stream Flow	Rch Trav Time	Rch Velocity	WD	Rch Width	Rch Depth	Tributary Temp	pH	Stream Temp	pH
	(cfsm)	(cfs)	(cfs)	(days)	(fps)		(ft)	(ft)	(°C)		(°C)	
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	Permitted	Design	Reserve Factor	Disc Temp	Disc pH
		Disc Flow (mgd)	Disc Flow (mgd)	Disc Flow (mgd)			
PADOT REST WES	PA0035602	0.0070	0.0070	0.0070	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		3.00	8.24	0.00	0.00		
NH3-N		25.00	0.00	0.00	0.70		

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
10D	18739	Trib 18739 to Beaver Run	2.060	492.00	4.81	0.00000	0.00	<input checked="" type="checkbox"/>

Stream Data

Design Cond.	LFY	Trib Flow	Stream Flow	Rch Trav Time	Rch Velocity	WD Ratio	Rch Width	Rch Depth	Tributary Temp	pH	Stream Temp	pH
	(cfsm)	(cfs)	(cfs)	(days)	(fps)		(ft)	(ft)	(°C)		(°C)	
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

<u>SWP Basin</u>			<u>Stream Code</u>			<u>Stream Name</u>						
10D			18739			Trib 18739 to Beaver Run						
RMI	Stream Flow	PWS With	Net Stream Flow	Disc Analysis Flow	Reach Slope	Depth	Width	W/D Ratio	Velocity	Reach Trav Time	Analysis Temp	Analysis pH
	(cfs)	(cfs)	(cfs)	(cfs)	(ft/ft)	(ft)	(ft)		(fps)	(days)	(°C)	
Q7-10 Flow												
2.510	0.47	0.00	0.47	.0108	0.00253	.461	11.1	24.06	0.09	0.294	20.11	7.00
Q1-10 Flow												
2.510	0.44	0.00	0.44	.0108	0.00253	NA	NA	NA	0.09	0.304	20.12	7.00
Q30-10 Flow												
2.510	0.55	0.00	0.55	.0108	0.00253	NA	NA	NA	0.10	0.269	20.10	7.00

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	<input checked="" type="checkbox"/>
WLA Method	EMPR	Use Inputted W/D Ratio	<input type="checkbox"/>
Q1-10/Q7-10 Ratio	0.94	Use Inputted Reach Travel Times	<input type="checkbox"/>
Q30-10/Q7-10 Ratio	1.17	Temperature Adjust Kr	<input checked="" type="checkbox"/>
D.O. Saturation	90.00%	Use Balanced Technology	<input checked="" type="checkbox"/>
D.O. Goal	5		

WQM 7.0 Wasteload Allocations

<u>SWP Basin</u>	<u>Stream Code</u>	<u>Stream Name</u>
10D	18739	Trib 18739 to Beaver Run

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
2.510 PADOT REST W		16.59	50	16.59	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
2.510 PADOT REST W		1.88	25	1.88	25	0	0

Dissolved Oxygen Allocations

RMI	Discharge Name	<u>CBOD5</u>		<u>NH3-N</u>		<u>Dissolved Oxygen</u>		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
2.51 PADOT REST WEST		10	10	25	25	3	3	0	0

WQM 7.0 D.O.Simulation

<u>SWP Basin</u>	<u>Stream Code</u>	<u>Stream Name</u>		
10D	18739	Trib 18739 to Beaver Run		
<u>RMI</u> 2.510	<u>Total Discharge Flow (mgd)</u> 0.007	<u>Analysis Temperature (°C)</u> 20.113	<u>Analysis pH</u> 7.000	
<u>Reach Width (ft)</u> 11.103	<u>Reach Depth (ft)</u> 0.461	<u>Reach WDRatio</u> 24.062	<u>Reach Velocity (fps)</u> 0.094	
<u>Reach CBOD5 (mg/L)</u> 2.18	<u>Reach Kc (1/days)</u> 0.128	<u>Reach NH3-N (mg/L)</u> 0.56	<u>Reach Kn (1/days)</u> 0.706	
<u>Reach DO (mg/L)</u> 8.125	<u>Reach Kr (1/days)</u> 18.619	<u>Kr Equation</u> Owens	<u>Reach DO Goal (mg/L)</u> 5	
<u>Reach Travel Time (days)</u> 0.294	Subreach Results			
	TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
	0.029	2.17	0.55	8.23
	0.059	2.16	0.54	8.23
	0.088	2.16	0.53	8.23
	0.117	2.15	0.52	8.23
	0.147	2.14	0.51	8.23
	0.176	2.13	0.50	8.23
	0.206	2.12	0.49	8.23
	0.235	2.12	0.48	8.23
	0.264	2.11	0.47	8.23
	0.294	2.10	0.46	8.23

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name					
		10D	18739	Trib 18739 to Beaver Run			
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)
2.510	PADOT REST WEST	PA0035602	0.007	CBOD5	10		
				NH3-N	25	50	
				Dissolved Oxygen			3

APPENDIX C

TRC ANALYSIS

1A	B	C	D	E	F	G			
2	TRC EVALUATION PA DOT Site 36 PA0035602								
3	Input appropriate values in B4:B8 and E4:E7								
4	0.4	= Q stream (cfs)		0.5	= CV Daily				
5	0.007	= Q discharge (MGD)		0.5	= CV Hourly				
6	30	= no. samples		1	= AFC_Partial Mix Factor				
7	0.3	= Chlorine Demand of Stream		1	= CFC_Partial Mix Factor				
8	0	= Chlorine Demand of Discharge		15	= AFC_Criteria Compliance Time (min)				
9	0.5	= BAT/BPJ Value		720	= CFC_Criteria Compliance Time (min)				
	0	= % Factor of Safety (FOS)		0	= Decay Coefficient (K)				
10	Source	Reference	AFC Calculations	Reference	CFC Calculations				
11	TRC	1.3.2.iii	WLA_afc = 11.802	1.3.2.iii	WLA_cfc = 11.499				
12	PENTOXSD TRG	5.1a	LTAMULT_afc = 0.373	5.1c	LTAMULT_cfc = 0.581				
13	PENTOXSD TRG	5.1b	LTA_afc = 4.398	5.1d	LTA_cfc = 6.685				
14									
15	Source	Effluent Limit Calculations							
16	PENTOXSD TRG	5.1f	AML MULT = 1.231						
17	PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.500	BAT/BPJ					
18			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	$\text{EXP}((0.5^{\text{LN}}(\text{cvh}^2+1))-2.326^{\text{LN}}(\text{cvh}^2+1)^{0.5})$							
	LTA_afc	$\text{wla_afc}^{\text{LTAMULT_afc}}$							
	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	$\text{EXP}((0.5^{\text{LN}}(\text{cvd}^2/\text{no_samples}+1))-2.326^{\text{LN}}(\text{cvd}^2/\text{no_samples}+1)^{0.5})$							
	LTA_cfc	$\text{wla_cfc}^{\text{LTAMULT_cfc}}$							
	AML MULT	$\text{EXP}(2.326^{\text{LN}}((\text{cvd}^2/\text{no_samples}+1)^{0.5})-0.5^{\text{LN}}(\text{cvd}^2/\text{no_samples}+1))$							
	AVG MON LIMIT	$\text{MIN}(\text{BAT_BPJ}, \text{MIN}(\text{LTA_afc}, \text{LTA_cfc})^{\text{AML_MULT}})$							
	INST MAX LIMIT	$1.5^*((\text{av_mon_limit}/\text{AML_MULT})/\text{LTAMULT_afc})$							