

Application Type Renewal
 Facility Type Non-Municipal
 Major / Minor Minor

**NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE**

Application No. PA0032751
 APS ID 1011257
 Authorization ID 1305379

Applicant and Facility Information

Applicant Name	<u>PA DOT Maintenance & Operations Bureau</u>	Facility Name	<u>PA DOT Rest Area 18</u>
Applicant Address	<u>400 North Street 6th Floor Harrisburg, PA 17120-0206</u>	Facility Address	<u>Safety Rest Area Site #18 Hadley, PA 16130</u>
Applicant Contact	<u>Nicholaus Sahd</u>	Facility Contact	<u>Roderick J. Donghia – Operator</u>
Applicant Phone	<u>(717) 951-8685</u>	Facility Phone	<u>(724) 813-8838</u>
Client ID	<u>189304</u>	Site ID	<u>451603</u>
Ch 94 Load Status	<u>Not Overloaded</u>	Municipality	<u>Deer Creek Township</u>
Connection Status	<u>No Limitations</u>	County	<u>Mercer</u>
Date Application Received	<u>January 31, 2020</u>	EPA Waived?	<u>Yes</u>
Date Application Accepted	<u>February 25, 2020</u>	If No, Reason	<u></u>
Purpose of Application	<u>Renewal of an NPDES Permit for an existing discharge of treated sanitary wastewater</u>		

Summary of Review

This application is for a renewal of an NPDES permit, for an existing Minor discharge of treated sewage from a Non-Municipal STP.

Act 14 – Proof of Notification was submitted and received.

There are no open violations regarding sewage treatment facilities for subject client ID (189304) as of 3/30/2021. There are, however, multiple violations regarding storage tanks in the SCRO and 1 storage tank violation in the NWRO.

The previous permit renewal was granted a phase-in period with relaxed monitoring for pH, Dissolved Oxygen, and TRC of 5/week. These three parameters will require daily sampling on the current permit renewal in order to be in compliance with the Department’s SOP entitled “Establishing Effluent Limitations for Discharges of Sewage”, which states, pH, TRC, and D.O. should be sampled daily for facilities with flows over 0.002 MGD.

A part 2 WQM permit is not required at this time.

Sludge use and disposal description and location(s): Septage must be pumped and hauled off-site by a septage hauler for land application under a general permit authorized by DEP or disposal at an STP.

Treatment consist of (WQM Permit No. 4317402): The treatment train will consist of a comminutor w/ a bypass bar screen, equalization tank, (2) extended aeration tanks, final clarifier, aerated sludge holding tank, chlorine contact tank w/ chlor/dechlor, post-aeration and an effluent pump station. The design organic load is 17.5 lb BOD/day. The treated sewage then discharges into Unnamed Tributary to Black Run (WWF).

Approve	Deny	Signatures	Date
X		Jon F. Bucha Jonathan F. Bucha / Civil Engineer General	April 26, 2021
X		Justin C. Dickey Justin C. Dickey, P.E. / Environmental Engineer Manager	April 30, 2021

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	<u>001</u>	Design Flow (MGD)	<u>.0087</u>
Latitude	<u>41° 28' 15"</u>	Longitude	<u>-80° 10' 4"</u>
Quad Name	<u>Hadley</u>	Quad Code	<u>0704</u>
Wastewater Description: <u>Sewage Effluent</u>			
Receiving Waters	<u>Unnamed Tributary to Black Run (WWF)</u>	Stream Code	<u>N/A</u>
NHD Com ID	<u>100476397</u>	RMI	<u>N/A</u>
Drainage Area	<u>4.19 mi² (first point full flowing)</u>	Yield (cfs/mi ²)	<u>0.1 (Default)</u>
Q ₇₋₁₀ Flow (cfs)	<u>0.42</u>	Q ₇₋₁₀ Basis	<u>Calculated</u>
Elevation (ft)	<u>1298</u>	Slope (ft/ft)	<u></u>
Watershed No.	<u>16-G</u>	Chapter 93 Class.	<u>WWF</u>
Existing Use	<u></u>	Existing Use Qualifier	<u></u>
Exceptions to Use	<u></u>	Exceptions to Criteria	<u></u>
Assessment Status	<u>Attaining Use(s)</u>		
Cause(s) of Impairment	<u></u>		
Source(s) of Impairment	<u></u>		
TMDL Status	<u></u>	Name	<u></u>
Background/Ambient Data		Data Source	
pH (SU)	<u>-</u>		<u>-</u>
Temperature (°F)	<u>-</u>		<u>-</u>
Hardness (mg/L)	<u>-</u>		<u>-</u>
Other:	<u>-</u>		<u>-</u>
Nearest Downstream Public Water Supply Intake	<u>Aqua Pennsylvania, Inc. - Emlenton</u>		
PWS Waters	<u>Allegheny River</u>	Flow at Intake (cfs)	<u>1,376</u>
PWS RMI	<u>90.0</u>	Distance from Outfall (mi)	<u>48.0</u>

Changes Since Last Permit Issuance: An instantaneous maximum reporting requirement of 1/year was added for E.Coli to comply with Chapter 92a.61, and the Departments SOP for "Establishing Effluent Limitations for Individual Sewage Permits" (SOP No. BPNPSM-PMT-033, version 1.9, Dated 3/24/2021).

Other Comments: Lake Wilhelm was determined to have algae growth and eutrophication concerns by Department Biologists during the 2010 permit renewal.

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.

Treatment Facility Summary				
Treatment Facility Name: PA DOT Rest Area 18				
WQM Permit No.		Issuance Date		
4317402		5/18/2017		
Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Tertiary	Extended Aeration	Chlorine With Dechlorination	0.0087
Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.0087	17.5	Not Overloaded	Aerated Sludge Holding Tank	Other WWTP

Changes Since Last Permit Issuance: The treatment facility was replaced with an all new facility in 2017. WQM permit #4372411, for the old facilities, was cancelled after construction of the new plant was completed. No planning approval was required since this was an in-kind replacement of the existing facility.

Other Comments: Chemical feedbox allows for Phosphorus removal.

Compliance History	
Summary of DMRs:	Review of the past 3 years of DMR reports indicates no effluent violations. Supplemental reports are being submitted as required and there have been no non-compliance issues since installation of the new treatment plant.
Summary of Inspections:	An inspection occurred on 12/20/2019, where no violations were noted, and the plant is being properly maintained with a routine maintenance schedule.

Other Comments: N/A

Compliance History

DMR Data for Outfall 001 (from March 1, 2020 to February 28, 2021)

Parameter	FEB-21	JAN-21	DEC-20	NOV-20	OCT-20	SEP-20	AUG-20	JUL-20	JUN-20	MAY-20	APR-20	MAR-20
Flow (MGD) Average Monthly	0.0007	0.0005	0.0008	0.0009	0.0010	0.0008	0.0011	0.0012	0.0012	0.0009	0.0004	0.0008
Flow (MGD) Daily Maximum	0.0008	0.0007	0.0010	0.0011	0.0012	0.0010	0.0012	0.0019	0.0013	0.0010	0.0005	0.0014
pH (S.U.) Minimum	7.0	6.9	7.0	7.0	7.0	7.0	7.0	6.9	7.1	7.0	7.1	7.0
pH (S.U.) Maximum	7.4	7.5	7.4	7.4	7.4	7.4	7.4	7.8	7.4	7.4	7.4	7.4
DO (mg/L) Minimum	7.0	7.1	7.1	7.0	7.0	7.0	7.0	7.1	7.0	7.1	6.9	6.7
TRC (mg/L) Average Monthly	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
TRC (mg/L) Instantaneous Maximum	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1
CBOD5 (mg/L) Average Monthly	4	3	4	3	4	4	3	4	4	4	4	3
CBOD5 (mg/L) Instantaneous Maximum	5	4	5	3	5	4	3	4	4	5	4	4
TSS (mg/L) Average Monthly	10	7	9	11	11	10	6	6	7	10	9	11
TSS (mg/L) Instantaneous Maximum	11	8	10	12	12	10	7	7	8	10	10	12
Fecal Coliform (CFU/100 ml) Geometric Mean	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Total Nitrogen (mg/L) Average Monthly	17.1	17.2	18.4	18.9	18.1	18.4	16.0	18.1	18.2	17.9	17.5	18.7
Ammonia (mg/L) Average Monthly	6.7	7.1	7.1	7.3	7.4	7.8	7.0	7.2	6.9	7.3	7.1	7.3

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PA DOT Rest Area 18**

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Ammonia (mg/L) Instantaneous Maximum	7.0	7.5	7.1	7.4	7.8	7.9	7.9	7.5	7.6	7.8	7.3	7.6
Total Phosphorus (mg/L) Average Monthly	0.900	0.900	0.900	0.800	0.500	0.700	0.8	0.7	0.7	0.6	0.42	0.8
Total Phosphorus (mg/L) Instantaneous Maximum	0.980	1.000	0.920	0.890	0.520	0.920	0.9	0.8	0.9	0.7	0.57	0.8

Development of Effluent Limitations

Outfall No. <u>001</u>	Design Flow (MGD) <u>.0087</u>
Latitude <u>41° 28' 15.00"</u>	Longitude <u>-80° 10' 4.00"</u>
Wastewater Description: <u>Sewage Effluent</u>	

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)

Water Quality-Based Limitations

The following limitations were determined through water quality modeling (Attachment D and Attachment E):

Parameter	Limit (mg/l)	SBC	Model
Ammonia Nitrogen	8.5	Average Monthly	WQM 7.0

Comments: Water Quality Modeling calculations were the same as the previous renewal's ammonia nitrogen limit of 10.59 mg/L, which is less restrictive than the NPDES limit of 8.5 mg/L, due to modeling input changes. Since the permittee is consistently meeting the existing ammonia nitrogen limits, no changes will be made with this renewal, in order to ensure protection of the streams. The existing winter limit of 25.5 mg/L will remain on this permit renewal.

Best Professional Judgment (BPJ) Limitations

Comments: A total phosphorus limit of 1.0 mg/l as a monthly average will remain in the renewed permit due to Lake Wilhelm being determined to have algae growth and eutrophication concerns that was determined by Department Biologists during the 2010 permit renewal.

Additional Considerations

E. Coli monitoring of 1/year has been added based on Ch. 92a.61(11)(12).

Anti-Backsliding

Anti-Backsliding considerations do not apply since the effluent limitations have not been relaxed from the previous permit renewal.

Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (362-0400-001), SOPs and/or BPJ.

Outfall 001, 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	1/week	Measured
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	4.0 Daily Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
CBOD5	XXX	XXX	XXX	25.0	XXX	50.0	2/month	Grab
TSS	XXX	XXX	XXX	30.0	XXX	60.0	2/month	Grab
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000	XXX	10000	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200	XXX	1000	2/month	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/year	Grab
Total Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	2/month	Grab
Ammonia Nov 1 - Apr 30	XXX	XXX	XXX	25.5	XXX	51.0	2/month	Grab
Ammonia May 1 - Oct 31	XXX	XXX	XXX	8.5	XXX	17.0	2/month	Grab
Total Phosphorus	XXX	XXX	XXX	1.0	XXX	2.0	2/month	Grab

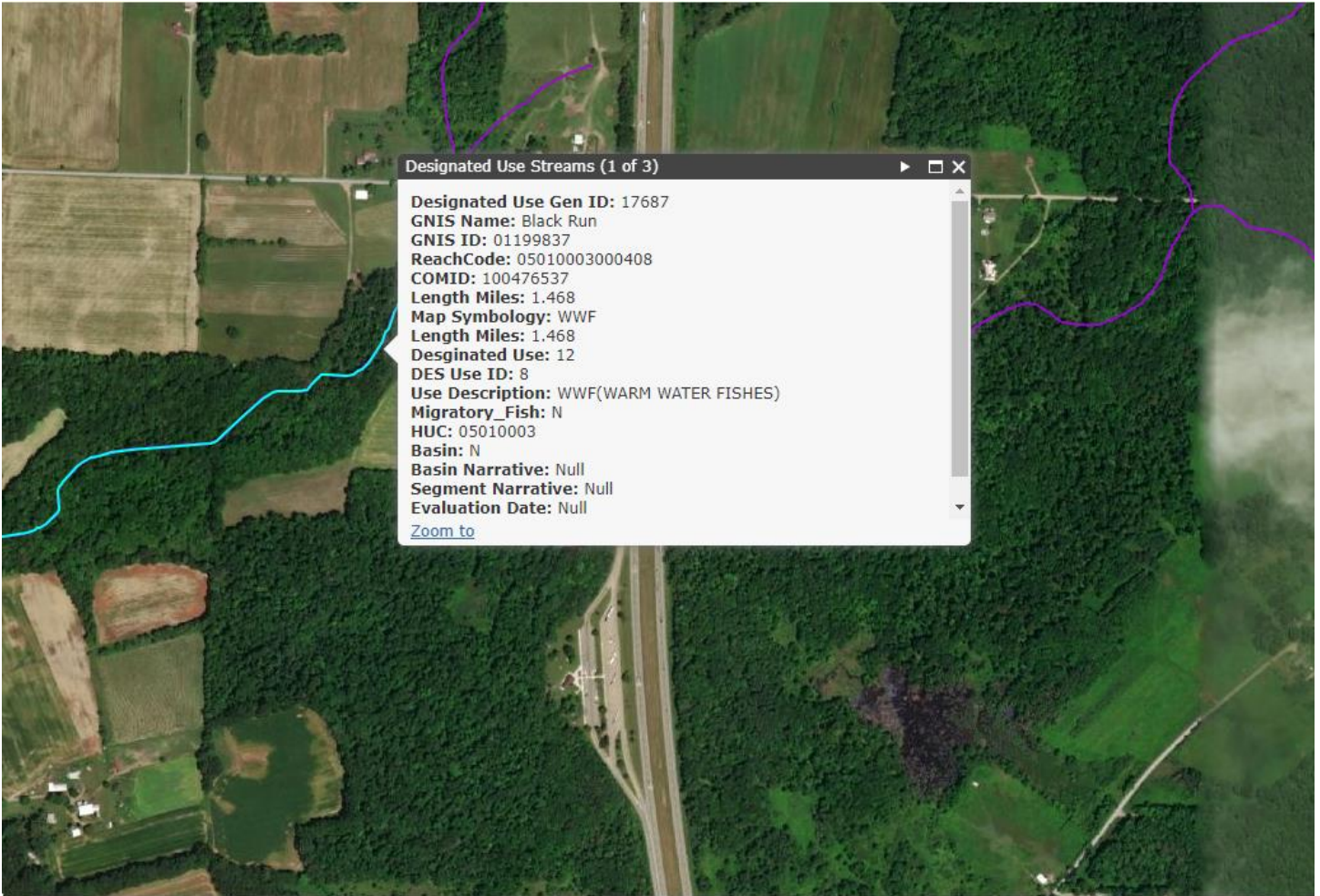
Compliance Sampling Location: Outfall 001 after disinfection.

Other Comments: N/A

Tools and References Used to Develop Permit	
<input checked="" type="checkbox"/>	WQM for Windows Model (see Attachment D and Attachment E)
<input checked="" type="checkbox"/>	TRC Model Spreadsheet (see Attachment F)
<input checked="" type="checkbox"/>	Technical Guidance for the Development and Specification of Effluent Limitations, 362-0400-001, 10/97.
<input checked="" type="checkbox"/>	Determining Water Quality-Based Effluent Limits, 391-2000-003, 12/97.
<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, 391-2000-007, 6/2004.
<input checked="" type="checkbox"/>	SOP: Establishing Effluent Limitations for Individual Sewage Permits (SOP No. BPNPSM-PMT-033) dated November 9, 2012, Revised March 24, 2021).

ATTACHMENT A

EMAP – STREAM DESIGNATION



ATTACHMENT B

STREAMSTATS REPORT – RMI 1.84 ON BLACK RUN (First perennial conditions)

Region ID:

PA

Workspace ID:

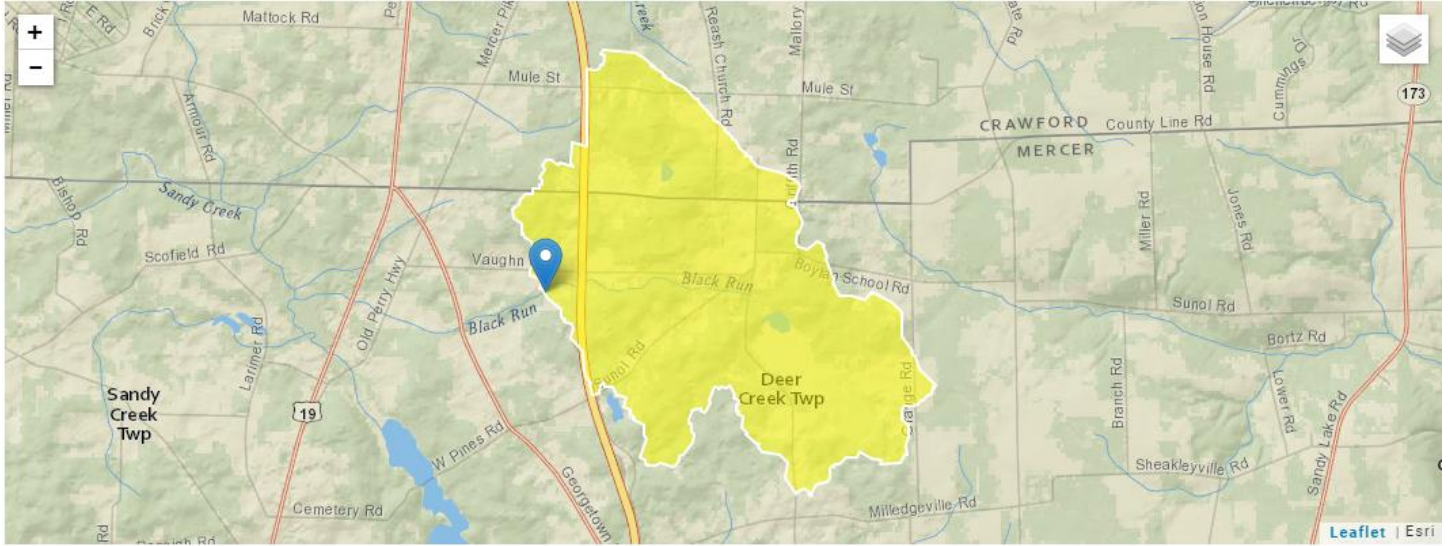
PA20210424033042007000

Clicked Point (Latitude, Longitude):

41.47187, -80.17168

Time:

2021-04-23 23:30:58 -0400



Basin Characteristics			
Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	4.19	square miles
ELEV	Mean Basin Elevation	1403	feet
PRECIP	Mean Annual Precipitation	43	inches

ATTACHMENT C

STREAMSTATS REPORT – RMI 1.4 ON BLACK RUN

StreamStats Report

Region ID:

PA

Workspace ID:

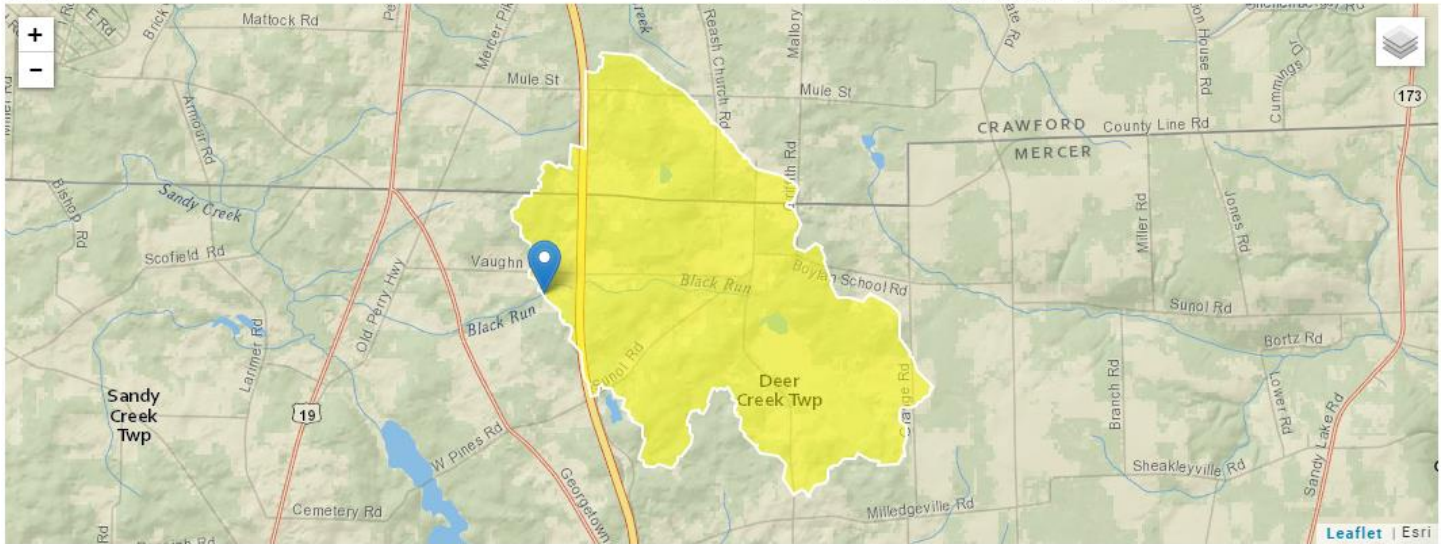
PA20210424033042007000

Clicked Point (Latitude, Longitude):

41.47187, -80.17168

Time:

2021-04-23 23:30:58 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	4.19	square miles
ELEV	Mean Basin Elevation	1403	feet
PRECIP	Mean Annual Precipitation	43	inches

ATTACHMENT D

WQM 7.0 MODEL OUTPUT FILE (DRY STREAM REACH)

WQM 7.0 Effluent Limits

<u>SWP Basin</u>	<u>Stream Code</u>	<u>Stream Name</u>					
16G	58656	BLACK 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)
0.330	PA Rest Area 18	PA0032751	0.000	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			4

WQM 7.0 D.O.Simulation

<u>SWP Basin</u>	<u>Stream Code</u>	<u>Stream Name</u>			
16G	58656	BLACK RUN			
<u>RMI</u>	<u>Total Discharge Flow (mgd)</u>	<u>Analysis Temperature (°C)</u>		<u>Analysis pH</u>	
0.330	0.009	20.000		7.200	
<u>Reach Width (ft)</u>	<u>Reach Depth (ft)</u>	<u>Reach WDRatio</u>		<u>Reach Velocity (fps)</u>	
1.155	0.300	3.851		0.050	
<u>Reach CBOD5 (mg/L)</u>	<u>Reach Kc (1/days)</u>	<u>Reach NH3-N (mg/L)</u>		<u>Reach Kn (1/days)</u>	
19.27	1.500	19.27		0.700	
<u>Reach DO (mg/L)</u>	<u>Reach Kr (1/days)</u>	<u>Kr Equation</u>		<u>Reach DO Goal (mg/L)</u>	
3.542	27.189	Owens		NA	
<u>Reach Travel Time (days)</u>	<u>Subreach Results</u>				
0.399	<u>TravTime (days)</u>	<u>CBOD5 (mg/L)</u>	<u>NH3-N (mg/L)</u>	<u>D.O. (mg/L)</u>	
	0.040	18.15	18.74	2.00	
	0.080	17.10	18.23	2.00	
	0.120	16.10	17.72	2.00	
	0.160	15.17	17.23	2.00	
	0.200	14.29	16.76	2.00	
	0.239	13.46	16.30	2.00	
	0.279	12.68	15.85	2.00	
	0.319	11.94	15.41	2.00	
	0.359	11.25	14.99	2.00	
	0.399	10.59	14.58	2.00	

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
16G	58656	BLACK RUN	0.330	1340.00	0.04	0.00000	0.00	<input type="checkbox"/>

Stream Data

Design Cond.	LFY	Trib Flow	Stream Flow	Rch Trav Time	Rch Velocity	WD Ratio	Rch Width	Rch Depth	Tributary Temp	Tributary pH	Stream Temp	Stream 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	7.20	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 Rest Area 18	PA0032751	0.0000	0.0000	0.0087	0.000	20.00	7.20
Parameter Data							
Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)			
CBOD5	25.00	0.00	0.00	1.50			
Dissolved Oxygen	4.00	2.00	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
16G	58656	BLACK RUN	0.001	1298.00	4.19	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	Tributary pH	Stream Temp	Stream 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	25.00	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>								
16G		58656		BLACK RUN								
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												
0.330	0.00	0.00	0.00	.0135	0.02418	.3	1.16	3.85	0.05	0.399	20.00	7.20
Q1-10 Flow												
0.330	0.00	0.00	0.00	.0135	0.02418	NA	NA	NA	0.00	0.000	0.00	0.00
Q30-10 Flow												
0.330	0.01	0.00	0.00	.0135	0.02418	NA	NA	NA	0.00	0.000	0.00	0.00

WQM 7.0 Modeling Specifications

Parameters	D.O.	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	0.64	Use Inputted Reach Travel Times	<input type="checkbox"/>
Q30-10/Q7-10 Ratio	1.36	Temperature Adjust Kr	<input checked="" type="checkbox"/>
D.O. Saturation	90.00%	Use Balanced Technology	<input checked="" type="checkbox"/>
D.O. Goal	2		

WQM 7.0 Wasteload Allocations

<u>SWP Basin</u>	<u>Stream Code</u>	<u>Stream Name</u>
16G	58656	BLACK RUN

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)		
0.33	PA Rest Area 18	25	25	25	25	4	4	0	0

ATTACHMENT E

WQM 7.0 MODEL OUTPUT FILE (PERENIAL REACH)

WQM 7.0 Effluent Limits

<u>SWP Basin</u>	<u>Stream Code</u>	<u>Stream Name</u>					
16G	58656	BLACK 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)
1.840	Black Run	PA0032751	0.000	CBOD5	10.59		
				NH3-N	14.58	29.16	
				Dissolved Oxygen			2

WQM 7.0 D.O.Simulation

<u>SWP Basin</u>	<u>Stream Code</u>	<u>Stream Name</u>			
16G	58656	BLACK RUN			
RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)		Analysis pH	
1.840	0.009	24.844		7.005	
Reach Width (ft)	Reach Depth (ft)	Reach WDRatio		Reach Velocity (fps)	
9.439	0.444	21.247		0.103	
Reach CBOD5 (mg/L)	Reach Kc (1/days)	Reach NH3-N (mg/L)		Reach Kn (1/days)	
2.27	0.178	0.45		1.016	
Reach DO (mg/L)	Reach Kr (1/days)	Kr Equation		Reach DO Goal (mg/L)	
8.046	23.834	Owens		5	
Reach Travel Time (days)	Subreach Results				
0.261	TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)	
	0.026	2.25	0.44	7.56	
	0.052	2.24	0.43	7.56	
	0.078	2.23	0.42	7.56	
	0.104	2.22	0.41	7.56	
	0.130	2.20	0.40	7.56	
	0.156	2.19	0.39	7.56	
	0.183	2.18	0.38	7.56	
	0.209	2.16	0.37	7.56	
	0.235	2.15	0.36	7.56	
	0.261	2.14	0.35	7.56	

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
16G	58656	BLACK RUN	1.840	1298.00	4.19	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	Tributary pH	Stream Temp	Stream 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	25.00	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
Black Run	PA0032751	0.0000	0.0000	0.0087	0.000	20.00	7.20

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	10.59	2.00	0.00	1.50
Dissolved Oxygen	2.00	8.24	0.00	0.00
NH3-N	14.58	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
16G	58656	BLACK RUN	1.400	1270.00	4.65	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	Tributary pH	Stream Temp	Stream 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	25.00	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>								
16G		58656		BLACK RUN								
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												
1.840	0.42	0.00	0.42	.0135	0.01205	.444	9.44	21.25	0.10	0.261	24.84	7.01
Q1-10 Flow												
1.840	0.27	0.00	0.27	.0135	0.01205	NA	NA	NA	0.08	0.332	24.76	7.01
Q30-10 Flow												
1.840	0.57	0.00	0.57	.0135	0.01205	NA	NA	NA	0.12	0.221	24.88	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	0.64	Use Inputted Reach Travel Times	<input type="checkbox"/>
Q30-10/Q7-10 Ratio	1.36	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>
16G	58656	BLACK 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
1.840	Black Run	6.84	29.16	6.84	29.16	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
1.840	Black Run	1.35	14.58	1.35	14.58	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)		
1.84	Black Run	10.59	10.59	14.58	14.58	2	2	0	0

ATTACHMENT F TRC SPREADSHEET

TRC EVALUATION					
Input appropriate values in A3:A9 and D3:D9					
0.1	= Q stream (cfs)	0.5	= CV Daily		
0.0087	= 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 = 2.389		1.3.2.iii	WLA_cfc = 2.322
PENTOXSD TRG	5.1a	LTAMULT_afc = 0.373		5.1c	LTAMULT_cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc = 0.890		5.1d	LTA_cfc = 1.350
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)				
	(0.011/EXP(-K*CFC_tc/1440))+(((CFC_Yc*Qs*0.011)/(1.547*Qd))....*EXP(-K*CFC_tc/1440)))+Xd+(CFC_Yc*Qs*Xs/1.547*Qd)]*(1-FOS/100)				

ATTACHMENT G DISCHARGE PH

PA DOT Rest Area 18							
Deer Creek Township, Mercer County							
PA0032760		Discharge pH					
<u>Date</u>	<u>pH min</u>	<u>pH max</u>	<u>10[^] -pH min</u>	<u>10[^] -pH max</u>	<u>& pH max</u>	<u>-Log (Ave pH)</u>	
Jul-20	6.9	7.8	1.2589E-07	1.5849E-08	7.0871E-08	7.1	
Aug-20	7	7.4	0.0000001	3.9811E-08	6.9905E-08	7.2	
Sep-20	7	7.4	0.0000001	3.9811E-08	6.9905E-08	7.2	
Jul-19	6.9	7.4	1.2589E-07	3.9811E-08	8.2852E-08	7.1	
Aug-19	7	7.4	0.0000001	3.9811E-08	6.9905E-08	7.2	
Sep-19	7	7.4	0.0000001	3.9811E-08	6.9905E-08	7.2	
Jul-18	7.1	7.5	7.9433E-08	3.1623E-08	5.5528E-08	7.3	
Aug-18	6.8	7.5	1.5849E-07	3.1623E-08	9.5056E-08	7.0	
Sep-18	7	7.5	0.0000001	3.1623E-08	6.5811E-08	7.2	
Jul-17	7	7.5	0.0000001	3.1623E-08	6.5811E-08	7.2	
					Median:	7.2	