pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0084182**
Facility Type	**Municipal**	APS ID	**731005**
Major / Minor	**Minor**	Authorization ID	**1398257**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Peters Township Municipal Authority**	Facility Name	**Peters Township Fort Loudon STP**
Applicant Address	PO Box 19 5000 Steele Avenue	Facility Address	1660 Fort Loudon Road
	Lemasters, PA 17231-0019		Mercersburg, PA 17236
Applicant Contact	Forsyth Derek	Facility Contact	Forsyth Derek
Applicant Phone	(717) 977-1007	Facility Phone	(717) 977-1007
Client ID	273166	Site ID	451949
Ch 94 Load Status	Existing Organic Overload	Municipality	Peters Township
Connection Status	No Limitations	County	Franklin
Date Application Received	June 1, 2022	EPA Waived?	Yes
Date Application Accepted	June 3, 2022	If No, Reason	
Purpose of Application	NPDES Permit Renewal.		

Summary of Review

Peters Township Municipal Authority (PTMA) has applied to the Pennsylvania Department of Environmental Protection (DEP) for reissuance of its NPDES permit. The permit was last reissued on April 20, 2018 and became effective on May 1, 2018. The permit will expire on April 30, 2023.

Based on the review, it is recommended that the permit be drafted.

Sludge use and disposal description and location(s): Sludge is stored on site prior to being sent to another WWTP for further treatment.

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
X		*Jinsu Kim* Jinsu Kim / Environmental Engineering Specialist	October 21, 2022
X		Daniel W. Martin Daniel W. Martin, P.E. / Environmental Engineer Manager	November 15, 2022

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	001	Design Flow (MGD)	0.1
Latitude	39º 53' 44"	Longitude	-77º 53' 31 "
Quad Name	McConnellsburg	Quad Code	1922
Wastewater Description:	Sewage Effluent		
Receiving Waters	West Branch Conococheague Creek	Stream Code	59398
NHD Com ID	49482558	RMI	19.6
Drainage Area	100 sq.mi.	Yield (cfs/mi^2)	0.0598
Q_{7-10} Flow (cfs)	5.98	Q_{7-10} Basis	USGS StreamStats
Elevation (ft)	568	Slope (ft/ft)	
Watershed No.	13-C	Chapter 93 Class.	TSF, MF
Existing Use	None	Existing Use Qualifier	None
Exceptions to Use	None	Exceptions to Criteria	None
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment			
Source(s) of Impairment			
TMDL Status		Name	
Nearest Downstream Public Water Supply Intake	Hagerstown		
PWS Waters	Potomac River	Flow at Intake (cfs)	
PWS RMI		Distance from Outfall (mi)	49

Drainage Area
The discharge is to West Branch Conococheague Creek at RMI 19.6. A drainage area upstream of the discharge is determined to be 100 sq.mi. according to USGS StreamStats available at https://streamstats.usgs.gov/ss/.

Stream Flow
There is no USGS gauging station in the vicinity of the point of discharge. A Q7-10 flow value of 5.98 cfs generated from USGS Stream Stats will be used in water quality modeling. This results in a low flow yield of 5.98 cfs / 100 sq.mi. = 0.0598cfs/sq.mi.

West Branch Conococheague Creek
25 Pa Code §93.9z classifies the West Branch Conococheague Creek (main stem, US 30 Bridge to PA-MD State Border) as trout stocking surface water. No special protection waters are impacted by this discharge. The discharge is located in a stream segment listed as attaining uses. No local TMDL has been taken into consideration during this review.

Public Water Supply Intake
The nearest downstream public water supply intake is the Hagerstown intake located on the Potomac River approximately 49 miles from the discharge. Considering the distance and nature, the discharge is not expected to significantly affect the water supply.

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

Treatment Facility Summary				
Treatment Facility Name: Peters Township Fort Loudon STP				
WQM Permit No.	**Issuance Date**			
2890401	January 28, 1991			
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Secondary	Extended Aeration	Hypochlorite	0.1
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.1	208	Not Overloaded	Sludge Holding	Other WWTP

PTMA owns and operates the sanitary wastewater treatment facility located in Peters Township, Franklin County. PTMA, in fact, operates two (2) treatment facilities in its municipality; the Mercersburg Junction STP in Mercersburg, PA and the Fort Loudon STP in Fort Loudon, PA. This NPDES permit covers discharges of sewage treated by the Fort Loudon STP. The facility only serves the Fort Loudon area of Peters Township and all sewer systems are 100% separated. With having both annual average design flow and hydraulic design capacity of 0.10 MGD, this facility utilizes an extended aeration activated sludge treatment process consisting of an aeration tank, clarifier, chlorine contact tank, and outfall structure to the West branch Conococheague Creek. The facility utilizes a sludge holding tank. Sludge from this tank is then sent to the Mercersburg Junction STP for further treatment prior to hauled off-site for landfill. Sodium hypochlorite is used for disinfection and lime is used for pH control. There is no industrial/commercial user contributing industrial wastewater to the sewer system.

Compliance History	
Summary of DMRs:	A summary of past DMR data is presented on the next page.
Summary of Inspections:	05/28/2020: Brandon Bettinger, DEP Water Quality Specialist, conducted an administrative inspection. No issues were noted at the time of inspection.
Other Comments	A file review revealed that there is no open violation associated with this facility.

Effluent Data

DMR Data for Outfall 001 (from May 1, 2021 to April 30, 2022)

Parameter	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21	SEP-21	AUG-21	JUL-21	JUN-21	MAY-21
Flow (MGD) Average Monthly	0.034	0.034	0.035	0.034	0.035	0.04	0.043	0.05	0.046	0.042	0.041	0.038
Flow (MGD) Daily Maximum	0.045	0.049	0.058	0.043	0.042	0.049	0.051	0.136	0.08	0.06	0.054	0.046
pH (S.U.) Daily Minimum	7.0	6.9	6.8	6.9	6.7	7.0	6.9	6.9	7.0	7.0	7.0	6.9
pH (S.U.) Daily Maximum	7.2	7.2	7.0	7.1	7.0	7.1	7.1	7.3	7.2	7.3	7.2	7.2
DO (mg/L) Daily Minimum	6.3	6.7	6.9	7.0	6.3	6.2	5.7	5.4	5.4	5.2	5.1	5.4
TRC (mg/L) Average Monthly	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4
TRC (mg/L) Instantaneous Maximum	0.5	0.5	0.5	0.8	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5
CBOD5 (lbs/day) Average Monthly	0.7	0.9	< 0.8	< 0.6	< 0.6	< 0.7	< 1.0	1.0	1.0	1.0	0.9	< 0.6
CBOD5 (lbs/day) Raw Sewage Influent Average Monthly	112	59	98	72	96	115	62	90	84	88	92	93
CBOD5 (lbs/day) Raw Sewage Influent Daily Maximum	131	66	123	75	100	159	71	94	84	96	93	96
CBOD5 (lbs/day) Weekly Average	0.8	1.0	< 1.0	0.7	< 0.7	< 0.7	1.0	1.0	2.0	2.0	1.0	0.7
CBOD5 (mg/L) Average Monthly	2.0	3.6	< 2.0	< 2.1	< 2.0	< 2.0	< 2.8	2.6	3.6	3.5	2.2	< 2.1
CBOD5 (mg/L) Raw Sewage Influent Average Monthly	362	235	257	237	306	339	159	209	221	251	229	318
CBOD5 (mg/L) Weekly Average	2.1	5.0	< 2.0	2.2	< 2.0	< 2.0	3.5	2.6	4.1	4.4	2.3	2.3
TSS (lbs/day) Average Monthly	1.0	1.0	2.0	< 2.0	0.8	1.0	< 1.0	2.0	1.0	2.0	2.0	2.0
TSS (lbs/day) Raw Sewage Influent Average Monthly	19	17	18	20	40	49	24	101	30	28	33	21

Parameter	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21	SEP-21	AUG-21	JUL-21	JUN-21	MAY-21
TSS (lbs/day) Raw Sewage Influent Daily Maximum	19	23	19	25	57	68	25	164	33	32	35	24
TSS (lbs/day) Weekly Average	2.0	1.0	3.0	4.0	0.9	1.0	2.0	2.0	2.0	2.0	2.0	2.0
TSS (mg/L) Average Monthly	3.5	4.0	5.5	< 7.5	2.5	3.5	< 2.5	4.8	3.5	4.8	5.3	5.5
TSS (mg/L) Raw Sewage Influent Average Monthly	59	65	52	66	130	154	61	273	78	79	80	72
TSS (mg/L) Weekly Average	4.5	5.5	6.5	14.0	3.0	4.0	4.0	6.5	4.0	5.5	5.5	6.0
Fecal Coliform (No./100 ml) Geometric Mean	5.0	8.0	2.0	2.0	< 1.0	2.0	10	8.0	44	13	< 3.0	< 2.0
Fecal Coliform (No./100 ml) Instantaneous Maximum	7.0	9.0	2.0	4.0	< 1.0	4.0	17	34	159	174	9.0	3.0
Total Nitrogen (lbs/day) Daily Maximum		< 18			< 19			< 21			< 20	
Total Nitrogen (mg/L) Daily Maximum		< 59.74			< 53.1			< 57.3			< 68.06	
Ammonia (lbs/day) Average Monthly	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.1
Ammonia (mg/L) Average Monthly	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Total Phosphorus (lbs/day) Daily Maximum		2.0			2.0			2.0			2.0	
Total Phosphorus (mg/L) Daily Maximum		5.65			6.05			6.45			7.1	

Existing Effluent Limitations and Monitoring Requirements

The table below summarizes effluent limitations and monitoring requirements specified in the current NPDES permit renewal.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) [1]		Concentrations (mg/L)				Minimum [2] Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	9.0 Daily Max	XXX	1/day	Grab
Dissolved Oxygen	XXX	XXX	5.0 Daily Min	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	21	33	XXX	25.0	40.0	50	2/month	8-Hr Composite
Carbonaceous Biochemical Oxygen Demand (CBOD5) Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Total Suspended Solids	25	38	XXX	30.0	45.0	60	2/month	8-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/month	8-Hr Composite
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
Total Nitrogen	XXX	Report Daily Max	XXX	XXX	Report Daily Max	XXX	1/quarter	Calculation
Ammonia-Nitrogen	Report	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Total Phosphorus	XXX	Report Daily Max	XXX	XXX	Report Daily Max	XXX	1/quarter	8-Hr Composite

Development of Effluent Limitations and Monitoring Requirements

Outfall No. 001 **Design Flow (MGD)** 0.1
Latitude 39º 53' 44.13" **Longitude** -77º 53' 31.10"
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)

Water Quality-Based Limitations

CBOD5, NH3-N and Dissolved Oxygen (DO)
WQM 7.0 version 1.0b is a water quality model designed to assist DEP to determine appropriate permit requirements for CBOD5, NH3-N and DO. DEP's technical guidance no. 391-2000-007 describes the technical methods contained in the model for conducting wasteload allocation analyses and for determining recommended limits for point source discharges. DEP recently updated this model (ver. 1.1) to include new ammonia criteria that has been approved by US EPA as part of the 2017 Triennial Review. The model was utilized, and the model output indicated that all existing requirements are still appropriate. Therefore, no changes are recommended.

Total Residual Chlorine
Since sodium hypochlorite is used for disinfection, Total Residual Chlorine (TRC) effluent levels must be regulated in accordance with 25 Pa Code §92a.48(b). DEP's TRC_CALC worksheet is utilized to determine if the existing BAT TBEL of 0.5 mg/L is still appropriate. The worksheet indicates that existing limits of 0.5 mg/L (average monthly) and 1.6 mg/L (IMAX) are still protective of water quality.

Toxics
DEP's NPDES permit application for minor sewages (less than 1.0 MGD) requires samples of heavy metals including Total Copper, Total Lead, and Total Zinc when the facility receives industrial or commercial contributions. The application shows no sample results. The sample results for TDS and its constituents showed effluent levels of these pollutants are not of concern. Therefore, no toxic pollutants are determined to be pollutants of concern for this facility.

Best Professional Judgment (BPJ) Limitations

Dissolved Oxygen
A minimum of 5.0 mg/L for DO is an existing effluent limit and will remain unchanged in the draft permit as recommended by DEP's SOP. This requirement has also been assigned to other major sewage facilities in the region. 5.0 mg/L is taken directly from 25 Pa. Code § 93.7(a) and it is also determined to be appropriate according to water quality modeling.

Total Phosphorus & Total Nitrogen
DEP's SOP no. BPNPSM-PMT-033 recommends monitoring requirements for Total Phosphorus and Total Nitrogen for all sewage facilities. Therefore, a routine monitoring for Total Phosphorus and Total Nitrogen is recommended. Since the receiving stream, West Branch Conococheague Creek is not impaired for nutrients, quarterly sampling of Total Phosphorus and Total Nitrogen will provide ample data for the subsequent permit renewal.

Additional Considerations

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

Influent BOD & TSS Monitoring
As a result of negotiation with EPA, the existing influent monitoring reporting requirement for TSS and BOD5 will be maintained in the draft permit. This requirement has been consistently assigned to all municipal wastewater treatment facilities.

Chesapeake Bay TMDL
DEP's Phase II Watershed Implementation Plan (WIP) categorizes this facility as a phase 5 non-significant sewage facility that has a design flow less than 0.2 MGD but greater than 0.002 MGD. The WIP recommends monitoring and reporting for Total Nitrogen and Total Phosphorus throughout the permit term at a frequency no less than annual. As mentioned above, quarterly monitoring of these pollutants will continue to be written in the permit as recommended by DEP's SOP.

Total Dissolved Solids (TDS)
TDS and its associated solids including Bromide, Chloride, and Sulfate have become statewide pollutants of concern. The requirement to monitor these pollutants must be considered under the criteria specified in 25 Pa. Code § 95.10 and the following January 23, 2014 DEP Central Office Directive:

> *For point source discharges and upon issuance or reissuance of an individual NPDES permit:*
>
> *-Where the concentration of TDS in the discharge exceeds 1,000 mg/L, or the net TDS load from a discharge exceeds 20,000 lbs/day, and the discharge flow exceeds 0.1 MGD, Part A of the permit should include monitor and report for TDS, sulfate, chloride, and bromide. Discharges of 0.1 MGD or less should monitor and report for TDS, sulfate, chloride, and bromide if the concentration of TDS in the discharge exceeds 5,000 mg/L.*

The sample result shows that effluent contains a TDS concentration level of 766 mg/L and Bromide was non-detected. Accordingly, the requirement to monitor these pollutants is not necessary.

E. Coli Monitoring
DEP's SOP No. BCW-PMT-033 recommends under 25 Pa Code §92a.61 a routine monitoring for E. Coli in all new and reissued permits. Since the facility has now the annual average design flow of 0.10 MGD, a quarterly monitoring will be included in the permit.

Monitoring Frequency and Sample Type
Unless otherwise specified throughout this fact sheet, existing monitoring frequencies and sample types will remain unchanged in the permit.

Mass Loading Limitations
All effluent mass loading limits will be based on the formula: design flow x concentration limit x conversion factor of 8.34.

Antidegradation Requirements
All effluent limitations and monitoring requirements have been developed to ensure that existing instream water uses and the level of water quality necessary to protect the existing uses are maintained and protected.

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	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	9.0 Daily Max	XXX	1/day	Grab
DO	XXX	XXX	5.0 Daily Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
CBOD5	21	33	XXX	25.0	40.0	50	2/month	8-Hr Composite
CBOD5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/month	8-Hr Composite
TSS Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/month	8-Hr Composite
TSS	25	38	XXX	30.0	45.0	60	2/month	8-Hr Composite
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
Total Nitrogen	XXX	Report Daily Max	XXX	XXX	Report Daily Max	XXX	1/quarter	Calculation
Nitrate-Nitrite as N	XXX	Report Daily Max	XXX	XXX	Report Daily Max	XXX	1/quarter	8-Hr Composite
TKN	XXX	Report Daily Max	XXX	XXX	Report Daily Max	XXX	1/quarter	8-Hr Composite
Ammonia	Report	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Total Phosphorus	XXX	Report Daily Max	XXX	XXX	Report Daily Max	XXX	1/quarter	8-Hr Composite
E. Coli (No./100 mL)	XXX	XXX	XXX	XXX	XXX	Report	1/quarter	Grab

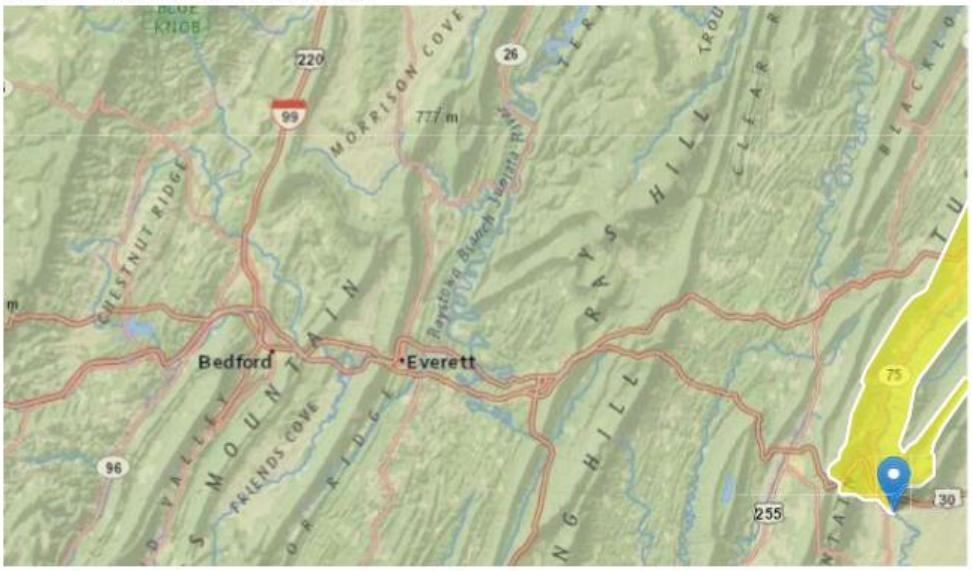
Tools and References Used to Develop Permit	
☐	WQM for Windows Model (see Attachment)
☐	Toxics Management Spreadsheet (see Attachment)
☐	TRC Model Spreadsheet (see Attachment)
☐	Temperature Model Spreadsheet (see Attachment)
☐	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
☐	Technical Guidance for the Development and Specification of Effluent Limitations, 362-0400-001, 10/97.
☐	Policy for Permitting Surface Water Diversions, 362-2000-003, 3/98.
☐	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 362-2000-008, 11/96.
☐	Technology-Based Control Requirements for Water Treatment Plant Wastes, 362-2183-003, 10/97.
☐	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 362-2183-004, 12/97.
☐	Pennsylvania CSO Policy, 385-2000-011, 9/08.
☐	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
☐	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 391-2000-002, 4/97.
☐	Determining Water Quality-Based Effluent Limits, 391-2000-003, 12/97.
☐	Implementation Guidance Design Conditions, 391-2000-006, 9/97.
☐	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.
☐	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 391-2000-008, 10/1997.
☐	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 391-2000-010, 3/99.
☐	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 391-2000-011, 5/2004.
☐	Implementation Guidance for Section 93.7 Ammonia Criteria, 391-2000-013, 11/97.
☐	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 391-2000-014, 4/2008.
☐	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 391-2000-015, 11/1994.
☐	Implementation Guidance for Temperature Criteria, 391-2000-017, 4/09.
☐	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 391-2000-018, 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, 391-2000-019, 10/97.
☐	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 391-2000-021, 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, 391-2000-022, 3/1999.
☐	Design Stream Flows, 391-2000-023, 9/98.
☐	Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 391-2000-024, 10/98.
☐	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 391-3200-013, 6/97.
☐	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
☐	SOP:
☐	Other:

Attachments

1. StreamStats

StreamStats Report

Region ID: PA
Workspace ID: PA20220616155301857000
Clicked Point (Latitude, Longitude): 39.89558, -77.89174
Time: 2022-06-16 11:53:21 -0400



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
CARBON	Percentage of area of carbonate rock	21.58	percent
DRNAREA	Area that drains to a point on a stream	100	square miles
PRECIP	Mean Annual Precipitation	40	inches
ROCKDEP	Depth to rock	4.4	feet
STRDEN	Stream Density -- total length of streams divided by drainage area	2.39	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	100	square miles	4.93	1280
PRECIP	Mean Annual Precipitation	40	inches	35	50.4
STRDEN	Stream Density	2.39	miles per square mile	0.51	3.1
ROCKDEP	Depth to Rock	4.4	feet	3.32	5.65
CARBON	Percent Carbonate	21.58	percent	0	99

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

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	11.4	ft^3/s	38	38
30 Day 2 Year Low Flow	14.7	ft^3/s	33	33
7 Day 10 Year Low Flow	5.98	ft^3/s	51	51
30 Day 10 Year Low Flow	7.78	ft^3/s	46	46
90 Day 10 Year Low Flow	10.9	ft^3/s	36	36

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/)

2. TRC_Calc Spreadsheet

TRC_CALC

1A	B	C	D	E	F	G
2	**TRC EVALUATION**					
3	Input appropriate values in B4:B8 and E4:E7					
4	5.89	**= Qstream (cfs)**		**0.5**	**=CV Daily**	
5	0.1	**= Qdischarge (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)**			**=Decay Coefficient (K)**	
10	Source	Reference	AFC Calculations		Reference	CFC Calculations
11	TRC	**1.3.2.iii**	WLA afc = 12.165		**1.3.2.iii**	WLA cfc = 11.852
12	PENTOXSD TRG	**5.1a**	LTAMULT afc = 0.373		**5.1c**	LTAMULT cfc = 0.581
13	PENTOXSD TRG	**5.1b**	LTA_afc= 4.533		**5.1d**	LTA_cfc = 6.890
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	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)**

3. WQM 7.0 ver. 1.1

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
	13C	59398	WEST BRANCH CONOCOCHEAGUE	**19.600**	568.00	100.00	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	5.98	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
Fort Loudon	PA0084182	0.1000	0.1000	0.1000	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

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drsinage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
13C	59398	WEST BRANCH CONOCOCHEAGUE	**14.800**	521.00	124.00	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	8.37	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
Merc. Junction	PA0084191	0.2500	0.2500	0.2500	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

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drsinage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
13C	59398	WEST BRANCH CONOCOCHEAGUE	**10.040**	495.00	141.00	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	10.80	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	0.00	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 D.O.Simulation

SWP Basin	Stream Code	Stream Name
13C	59398	WEST BRANCH CONOCOCHEAGUE CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
19.600	0.100	25.000	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
42.736	0.740	57.759	0.194
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.58	0.134	0.63	1.029
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
8.161	3.849	Tsivoglou	5
Reach Travel Time (days)			
1.512			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.151	2.52	0.54	7.54
0.302	2.45	0.46	7.54
0.454	2.39	0.40	7.54
0.605	2.33	0.34	7.54
0.756	2.27	0.29	7.54
0.907	2.21	0.25	7.54
1.058	2.16	0.21	7.54
1.210	2.10	0.18	7.54
1.361	2.05	0.16	7.54
1.512	2.00	0.13	7.54

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
14.800	0.350	25.000	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
51.686	0.793	65.139	0.217
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
3.00	0.240	1.18	1.029
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.617	2.405	Tsivoglou	5
Reach Travel Time (days)			
1.339			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.134	2.88	1.03	7.08
0.268	2.76	0.89	6.78
0.402	2.66	0.78	6.63
0.535	2.55	0.68	6.59
0.669	2.45	0.59	6.61
0.803	2.35	0.52	6.68
0.937	2.26	0.45	6.77
1.071	2.17	0.39	6.87
1.205	2.08	0.34	6.98
1.339	2.00	0.30	7.09

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
13C	59398	WEST BRANCH CONOCOCHEAGUE 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												
19.600	5.98	0.00	5.98	.1547	0.00185	.74	42.74	57.76	0.19	1.512	25.00	7.00
14.800	8.37	0.00	8.37	.5415	0.00103	.793	51.69	65.14	0.22	1.339	25.00	7.00
Q1-10 Flow												
19.600	3.83	0.00	3.83	.1547	0.00185	NA	NA	NA	0.15	1.926	25.00	7.00
14.800	5.36	0.00	5.36	.5415	0.00103	NA	NA	NA	0.17	1.687	25.00	7.00
Q30-10 Flow												
19.600	8.13	0.00	8.13	.1547	0.00185	NA	NA	NA	0.23	1.278	25.00	7.00
14.800	11.38	0.00	11.38	.5415	0.00103	NA	NA	NA	0.26	1.137	25.00	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	5		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
13C	59398	WEST BRANCH CONOCOCHEAGUE 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
19.600	Fort Loudon	11.07	50	11.07	50	0	0
14.800	Merc. Junction	11.07	50	11.07	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
19.600	Fort Loudon	1.37	25	1.37	25	0	0
14.800	Merc. Junction	1.37	25	1.37	25	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)		
19.60	Fort Loudon	25	25	25	25	5	5	0	0
14.80	Merc. Junction	25	25	25	25	5	5	0	0

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
13C	59398	WEST BRANCH CONOCOCHEAGUE 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)
19.600	Fort Loudon	PA0084182	0.100	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			5

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)
14.800	Merc. Junction	PA0084191	0.250	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			5