pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northcentral Regional Office
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Application Type	**Renewal**	Application No.	**PA0114715**
Facility Type	**Non-Municipal**	APS ID	**1068925**
Major / Minor	**Minor**	Authorization ID	**1405750**

Applicant and Facility Information

Applicant Name	**Hemlock Municipal Sewer Cooperative**	Facility Name	**Hemlock Municipal Sewer Cooperative Sewer System STP**
Applicant Address	PO Box 243	Facility Address	8 Ridge Road
	Bloomsburg, PA 17815-0243		Bloomsburg, PA 17815
Applicant Contact	Michael Demarco	Facility Contact	Michael Demarco
Applicant Phone	(570) 387-9632	Facility Phone	(570) 387-9632
Client ID	44283	Site ID	4849
Ch 94 Load Status	Not Overloaded	Municipality	Hemlock Township
Connection Status	No Limitations	County	Columbia
Date Application Received	August 5, 2022	EPA Waived?	Yes
Date Application Accepted	August 11, 2022	If No, Reason	

Purpose of Application: Application for the renewal of the existing individual NPDES permit.

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* Jonathan P. Peterman / Project Manager	July 12, 2023
X		*Nicholas W. Hartranft* Nicholas W. Hartranft, P.E. / Environmental Engineer Manager	July 12, 2023

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	001	Design Flow (MGD)	.3
Latitude	40º 59' 29.02"	Longitude	-76º 28' 39.09"
Quad Name	Bloomsburg	Quad Code	1034
Wastewater Description:	Sewage Effluent		
Receiving Waters	Fishing Creek	Stream Code	27623
NHD Com ID	65640765	RMI	1.8
Drainage Area	379	Yield (cfs/mi^2)	
Q_{7-10} Flow (cfs)	23.7	Q_{7-10} Basis	
Elevation (ft)	464	Slope (ft/ft)	
Watershed No.	5-C	Chapter 93 Class.	WWF
Existing Use	WWF	Existing Use Qualifier	N/A
Exceptions to Use	None.	Exceptions to Criteria	None.
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment	N/A		
Source(s) of Impairment	N/A		
TMDL Status	N/A	Name	N/A
Nearest Downstream Public Water Supply Intake	Danville Municipal Water Authority		
PWS Waters	Susquehanna River	Flow at Intake (cfs)	1120
PWS RMI	138.06	Distance from Outfall (mi)	10

Changes Since Last Permit Issuance: Given that there have been no changes to the facility or the receiving stream, the previous Q_{7-10} and WQM 7.0 inputs have been utilized in this review.

Other Comments: None.

Treatment Facility Summary

Treatment Facility Name: Hemlock Municipal Sewer Cooperative

WQM Permit No.	Issuance Date	Notes:
1903405 A-2	6/16/2016	Replacement of sludge centrifuge with Volute Dewatering Press.
1903405 A-1	7/23/2009	Upgrade of existing digesters, blowers, and conversion of half an EQ tank to an aerobic digester.
1903405	4/2/2004	Organic re-rate to 1,066 lb/day.
1991401 A-1	4/10/2001	Addition of a solids dewatering building with a centrifuge device.
1996404	10/23/1996	Replacement of existing collection and construction of pump station.
1991401	5/8/1992	Initial construction of the treatment plant and conveyance system.

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary	Extended Aeration	Gas Chlorine	0.3
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.355	1066	Not Overloaded	None	Other WWTP

Treatment System Components for Outfall 001:
- One (1) Influent wet well.
- One (1) Communitor.
- One (1) Manual bar screen.
- One (1) Flow distribution box.
- One (1) EQ tank.
- Two (2) Primary clarifiers.
- Eight (8) Aeration tanks.
  -2 Parallel treatment trains – 4 each.
- One (1) Gas chlorination system.
- One (1) Chlorine contact tank.
- One (1) Effluent flow meter.
- One (1) Outfall 001 to Fishing Creek.

- Three (3) Aerobic sludge digesters.
- One (1) Volute press.
- One (1) Sludge storage (roll-offs).

Changes Since Last Permit Issuance: None.
Other Comments: None.

Sludge use and disposal description and location(s): Approximately 51.99 dry tons of sludge is sent to Lycoming County Resource Management Services (LCRMS) annually.

TMDL Impairment

The Department's Geographic Information System (GIS) shows that the Hemlock Creek is not impaired and a TMDL does not exist for the stream segment. No further TMDL review is required.

Chesapeake Bay Requirements

Since this facility's hydraulic design capacity is 0.3 MGD, the permittee will be required to monitor and report TN and TP throughout the permit term at a frequency no less than monthly in accordance with the Phase III WIP Chesapeake Bay Strategy for Phase IV facilities (≥ 0.2 MGD and < 0.4 MGD).

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.

Trucked-In Waste

The application indicates that the facility receives hauled-in waste from residential holding tanks. The annual average volume is approximately 261,837 gallons and the projected volume is 280,000 gallons. The existing Part-C condition will be remain in the draft permit.

Existing Effluent Limitations and Monitoring Requirements

Existing Limits – Outfall 001

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	Metered
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	XXX	9.0	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	XXX	1.6	1/day	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	60	125	XXX	25.0	40.0	50	1/week	8-Hr Composite
Biochemical Oxygen Demand (BOD5) Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	8-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	8-Hr Composite
Total Suspended Solids	75	150	XXX	30.0	45.0	60	1/week	8-Hr Composite

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		
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	1/week	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/week	Grab
Ammonia-Nitrogen	Report	XXX	XXX	Report	XXX	XXX	1/month	8-Hr Composite
Total Nitrogen	Report	XXX	XXX	Report	XXX	XXX	1/month	8-Hr Composite
Total Phosphorus	Report	XXX	XXX	Report	XXX	XXX	1/month	8-Hr Composite

*The existing effluent limits for Outfall 001 were based on a design flow of 0.3 MGD.

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.3
Latitude 40º 59' 29.00" **Longitude** -76º 28' 39.00"
Wastewater Description: Sewage Effluent

Technology-Based Limitations

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

Pollutant	Limit (mg/l)	SBC	Federal Regulation	State Regulation
$CBOD_5$	25	Average Monthly	133.102(a)(4)(i)	92a.47(a)(1)
	40	Average Weekly	133.102(a)(4)(ii)	92a.47(a)(2)
Total Suspended Solids	30	Average Monthly	133.102(b)(1)	92a.47(a)(1)
	45	Average Weekly	133.102(b)(2)	92a.47(a)(2)
pH	6.0 – 9.0 S.U.	Min – Max	133.102(c)	95.2(1)
Fecal Coliform (5/1 – 9/30)	200 / 100 ml	Geo Mean	-	92a.47(a)(4)
Fecal Coliform (5/1 – 9/30)	1,000 / 100 ml	IMAX	-	92a.47(a)(4)
Fecal Coliform (10/1 – 4/30)	2,000 / 100 ml	Geo Mean	-	92a.47(a)(5)
Fecal Coliform (10/1 – 4/30)	10,000 / 100 ml	IMAX	-	92a.47(a)(5)
Total Residual Chlorine	0.5	Average Monthly	-	92a.48(b)(2)

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 the Toxics Management Spreadsheet.

WQM 7.0 for Windows, Version 1.0b, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen
Since there have been no changes to the watershed or the facility, the previous modeling results shall be utilized. The model was previously run using the Q7-10 stream flow, background water quality, average annual design flow, and other discharge characteristics. The existing technology based effluent limit for $CBOD_5$ (25 mg/l) and the existing water quality based effluent

limits for NH3-N (25 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	25	N/A	N/A
Ammonia-N	25	50	N/A
Dissolved Oxygen	N/A	N/A	3

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

Best Professional Judgment (BPJ) Limitations
See D.O. section below.

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.

Proposed Limits - 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	Metered
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	XXX	9.0	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	XXX	1.6	1/day	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	60	125	XXX	25.0	40.0	50	1/week	8-Hr Composite
Biochemical Oxygen Demand (BOD5) Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	8-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	8-Hr Composite
Total Suspended Solids	75	150	XXX	30.0	45.0	60	1/week	8-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	1/week	Grab

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		
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/week	Grab
Ammonia-Nitrogen	Report	XXX	XXX	Report	XXX	XXX	1/month	8-Hr Composite
Total Nitrogen	Report	XXX	XXX	Report	XXX	XXX	1/month	8-Hr Composite
Total Phosphorus	Report	XXX	XXX	Report	XXX	XXX	1/month	8-Hr Composite
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/quarter	Grab

*The proposed effluent limits for Outfall 001 were based on a design flow of 0.3 MGD.

Effluent Limit Determination for Outfall 001

General Information
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. The existing monitoring frequencies and sample types for these parameters generally correspond with the *Technical Guidance for the Development and Specification of Effluent Limitations* (362-0400-001) Table 6-3 and will remain.

Flow
Reporting of the daily maximum flow is consistent with monitoring requirements for other treatment plants and will remain.

Carbonaceous Biochemical Oxygen Demand ($CBOD_5$)
The results of the previous WQM 7.0 model show that the previously applied secondary treatment standards (25 PA Code §92a.47 (a) (1&2)) for $CBOD_5$ are protective of water quality and will remain.

Total Suspended Solids (TSS)
The previously applied technology based secondary treatment standards (25 PA Code §92a.47 (a) (1&2)) 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.

Total Residual Chlorine (TRC)
In accordance with 25 Pa. Code § 92a.48(b)(1), a site-specific BAT value of 0.5 mg/l (which is also the existing effluent limit) was used as the input in the TRC model evaluation. The attached TRC model indicates that the existing BAT effluent limits of 0.5 mg/L (Average Monthly) and 1.6 mg/L (Instantaneous Maximum) are protective of water quality and will remain.

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

Ammonia-Nitrogen (NH3-N)
The previous WQM 7.0 modeling results for summer indicates that an average monthly limit of 25 mg/L is acceptable. A year-round monitoring requirement for ammonia-nitrogen was previously established and will remain.

Dissolved Oxygen (DO)
25 PA Code §93.7 provides specific water quality criteria for DO and monitoring for this parameter will ensure that the facility is not creating or contributing to an in-stream excursion below these water quality standards

Influent BOD_5 and TSS
The Department requires the reporting of raw sewage influent monitoring for BOD_5 and TSS in all POTW permits. This provides the Department with the ability to monitor the percent removal of each parameter as stipulated in section 2 of the Part A conditions and maintain records of the BOD_5 loading as required by 25 Pa. Code Chapter 94. The monitoring frequencies and sample types will be identical to the effluent sampling.

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

Compliance History

Summary of Inspections -The last inspection of the facilities was conducted on 11/29/22 which reveals the facility was operating normally. The inspection noted the fecal violation shown below.
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.
DMRs Summary - Upon review of the last year of DMR's, the facility appears to be generally operating within the given effluent limits. There is one effluent violation noted over the past year for fecal coliform.

Compliance History

DMR Data for Outfall 001 (from June 1, 2022 to May 31, 2023)

Parameter	MAY-23	APR-23	MAR-23	FEB-23	JAN-23	DEC-22	NOV-22	OCT-22	SEP-22	AUG-22	JUL-22	JUN-22
Flow (MGD) Average Monthly	0.12966	0.11336	0.09740	0.08749	0.10637	0.10185	0.0957	0.10073	0.11665	0.12089	0.11857	0.11776
Flow (MGD) Daily Maximum	0.30586	0.41037	0.11973	0.10814	0.14957	0.18011	0.12751	0.14234	0.1885	0.14885	0.16084	0.14719
pH (S.U.) Daily Minimum	7.1	7.1	7.1	7.0	7.0	6.9	6.9	6.9	7.1	7.0	6.8	6.7
pH (S.U.) Instantaneous Maximum	7.4	7.4	7.4	7.5	7.3	7.2	7.3	7.6	7.4	7.2	7.4	6.9
DO (mg/L) Daily Minimum	3.01	3.31	2.95	3.62	3.66	2.74	3.22	3.25	2.95	3.01	2.83	2.41
TRC (mg/L) Average Monthly	0.38	0.34	0.42	0.35	0.37	0.39	0.36	0.36	0.32	0.35	0.33	0.43
TRC (mg/L) Instantaneous Maximum	1.0	0.9	0.9	0.8	1.0	0.9	1.1	1.1	1.3	1.0	0.9	1.0
CBOD5 (lbs/day) Average Monthly	< 3	< 2	< 4	< 2	< 3	< 7	< 4	< 2	< 5	< 5	< 3	< 3
CBOD5 (lbs/day) Weekly Average	< 4	< 2	9	2	6	19	10	3	7	12	< 3	< 3
CBOD5 (mg/L) Average Monthly	< 3.0	< 3.0	< 5.1	< 3.0	< 3.7	< 8.5	< 6.0	< 3.1	< 4.9	< 5.3	< 3.0	< 3.0
CBOD5 (mg/L) Weekly Average	< 3.0	< 3.0	9.5	< 3.0	6.4	22.1	12.3	3.5	9.0	12.1	< 3.0	3.1
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	240	265	200	267	198	261	292	351	339	391	346	482
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	258	314	222	314	244	347	421	500	487	540	519	555
BOD5 (mg/L) Raw Sewage Influent Average Monthly	234	359	267	410	246	335	433	456	384	434	393	576
TSS (lbs/day) Average Monthly	6	< 3	< 3	< 3	< 4	6	4	< 4	< 6	4	< 3	2
TSS (lbs/day) Raw Sewage Influent Average Monthly	92	115	91	96	145	149	132	120	224	297	213	189
TSS (lbs/day) Raw Sewage Influent Daily Maximum	117	249	152	161	249	242	353	211	350	592	498	406

TSS (lbs/day) Weekly Average	8	5	7	4	6	9	8	< 7	8	8	5	5
TSS (mg/L) Average Monthly	5.6	< 3.8	< 4.0	< 5.0	< 4.9	7.1	6.2	< 4.7	< 5.9	4.3	< 3.5	2.7
TSS (mg/L) Raw Sewage Influent Average Monthly	89	155	119	148	183	197	175	149	230	325	239	229
TSS (mg/L) Weekly Average	9.0	6.0	7.2	6.8	6.5	11.6	10.4	< 8.0	8.4	8.4	5.2	5.6
Fecal Coliform (No./100 ml) Geometric Mean	< 5	< 1	37	90	51	26	22	4	55	14	< 2	< 2
Fecal Coliform (No./100 ml) Instantaneous Maximum	45	1	326	980	261	165	249	15	1011	285	4.1	4
Total Nitrogen (lbs/day) Average Monthly	< 17	5	< 10	< 9	< 11	< 13	8	< 8	< 6.0	< 7	< 4	< 6
Total Nitrogen (mg/L) Average Monthly	< 11.275	7.2	< 9.691	< 13.09	< 12.3	< 15.9	9.5	< 8.5	< 4.9	< 7.0	< 5.2	< 7.1
Ammonia (lbs/day) Average Monthly	0.5	0.3	0.1	0.9	2.0	2	0.9	2	2.0	0.7	0.4	< 0.2
Ammonia (mg/L) Average Monthly	0.3	0.4	0.1	1.3	2.5	2.6	1.1	2	1.5	0.7	0.5	< 0.2
Total Phosphorus (lbs/day) Average Monthly	1.0	3.0	4.0	3	4	2	4.0	1.0	0.4	6	2	2
Total Phosphorus (mg/L) Average Monthly	0.8	3.8	4.1	1.3	4.3	2.8	4.4	1.1	0.3	6	2.8	2.4

Compliance History

Effluent Violations for Outfall 001, from: July 1, 2022 To: May 31, 2023

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
Fecal Coliform	09/30/22	IMAX	1011	No./100 ml	1000	No./100 ml

Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment)
☐	Toxics Management Spreadsheet (see Attachment)
☒	TRC Model Spreadsheet (see Attachment)
☐	Temperature Model Spreadsheet (see Attachment)
☐	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
☒	Technical Guidance for the Development and Specification of Effluent Limitations, 386-0400-001, 10/97.
☐	Policy for Permitting Surface Water Diversions, 386-2000-019, 3/98.
☒	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 386-2000-018, 11/96.
☐	Technology-Based Control Requirements for Water Treatment Plant Wastes, 386-2183-001, 10/97.
☐	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 386-2183-002, 12/97.
☐	Pennsylvania CSO Policy, 386-2000-002, 9/08.
☐	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
☐	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 386-2000-008, 4/97.
☒	Determining Water Quality-Based Effluent Limits, 386-2000-004, 12/97.
☐	Implementation Guidance Design Conditions, 386-2000-007, 9/97.
☒	Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 386-2000-016, 6/2004.
☐	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 386-2000-012, 10/1997.
☐	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 386-2000-009, 3/99.
☐	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 386-2000-015, 5/2004.
☒	Implementation Guidance for Section 93.7 Ammonia Criteria, 386-2000-022, 11/97.
☐	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 386-2000-013, 4/2008.
☒	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 386-2000-011, 11/1994.
☐	Implementation Guidance for Temperature Criteria, 386-2000-001, 4/09.
☐	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 386-2000-021, 10/97.
☐	Implementation Guidance for Application of Section 93.5(e) for Potable Water Supply Protection Total Dissolved Solids, Nitrite-Nitrate, Non-Priority Pollutant Phenolics and Fluorides, 386-2000-020, 10/97.
☐	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 386-2000-005, 3/99.
☐	Implementation Guidance for the Determination and Use of Background/Ambient Water Quality in the Determination of Wasteload Allocations and NPDES Effluent Limitations for Toxic Substances, 386-2000-010, 3/1999.
☒	Design Stream Flows, 386-2000-003, 9/98.
☐	Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 386-2000-006, 10/98.
☐	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 386-3200-001, 6/97.
☒	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
☐	SOP:
☐	Other:

APPENDIX A

Q_{7-10} ANALYSIS AND STREAM DATA

Stream Flow (Q_{7-10}) Calculation

Following process has been applied to calculate the stream flow

a. Two (2) points in the stream reach will be marked to be evaluated:
Point 001- RMI: 1.8, Elevation: 464.2 ft. Drainage Area (DA): 379.126 mi^2
Point 002- RMI: 1.0, Elevation: 450 ft. DA: 385.301mi^2

b. Calculate Stream Flows (Q_{7-10}) by using the following equation:

(Drainage Area of the location / Drainage Area of the stream gage) * gage statistic

Where,
Drainage Area of the stream gage = 274 mi^2
Gage statistic = 17.1 cfs (for Q_{7-10})

-Point 001,

(DAsite / DAgage) * gage static = (379.126 mi^2/274 mi^2) * 17.1 cfs = 23.7 cfs

-Point 002,

(DAsite / DAgage) * gage static = (385.301 mi^2/274 mi^2) * 17.1 cfs = 24.1 cfs

APPENDIX B

WQM 7.0 MODEL INPUT/OUTPUT

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
05C	27623	FISHING CREEK	1.800	464.00	379.13	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	23.70	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
Hemlock MS WWTP	PA0114715	0.0000	0.3000	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

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
05C	27623	FISHING CREEK	**1.000**	450.00	385.30	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	24.05	0.000	0.000	0.0	0.00	0.00	20.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
		0.0000	0.0000	0.0000	0.000	25.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	3.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
05C	27623	FISHING 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												
1.800	23.70	0.00	23.70	.4641	0.00331	.919	80.35	87.43	0.33	0.149	20.10	7.00
Q1-10 Flow												
1.800	21.57	0.00	21.57	.4641	0.00331	NA	NA	NA	0.31	0.157	20.11	7.00
Q30-10 Flow												
1.800	29.86	0.00	29.86	.4641	0.00331	NA	NA	NA	0.37	0.132	20.08	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	0.91	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.26	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	5		

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	0.91	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.26	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	5		

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	0.91	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.26	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	5		

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	0.91	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.26	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	5		

APPENDIX C

TRC MODEL SPREADHSEET

	B	C	D	E	F	G
1A						
2	**TRC EVALUATION**			**Hemlock Twp**		
3	Input appropriate values in B4:B8 and E4:E7					
4	23.7	= Q stream (cfs)		0.6	= CV Daily	
5	0.3	= Q discharge (MGD)		0.6	= 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 = 16.309		1.3.2.III	WLA cfc = 15.893
12	PENTOXSD TRG	5.1a	LTAMULT afc = 0.373		5.1c	LTAMULT cfc = 0.681
13	PENTOXSD TRG	5.1b	LTA_afc= 6.077		5.1d	LTA_cfc = 9.239
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)

APPENDIX D

FACILITY MAP AND SCHEMATIC

HMSC
B-1

HEMLOCK MUNICIPAL SEWER COOPERATIVE
WASTEWATER TREATMENT PLANT