pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0033057**
Facility Type	**Non-Municipal**	APS ID	**12404**
Major / Minor	**Minor**	Authorization ID	**1373900**

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Nolt Henry W**	Facility Name	**Crestview Village MHP**
Applicant Address	455b Middle Creek Road	Facility Address	Colebrook Road
	Lititz, PA 17543-7303		Middletown, PA 17057
Applicant Contact	Henry Nolt	Facility Contact	Jamie Weirich
Applicant Phone	(717) 733-6802	Facility Phone	(717) 943-0056
Client ID	39340	Site ID	1521
Ch 94 Load Status	Not Overloaded	Municipality	Londonderry Township
Connection Status		County	Dauphin
Date Application Received	October 25, 2021	EPA Waived?	Yes
Date Application Accepted	November 5, 2021	If No, Reason	

Purpose of Application: NPDES Renewal for discharge of treated sewage

Summary of Review

1.0 General Discussion

This fact sheet supports the renewal of an existing NPDES permit for the discharge of treated domestic sewage from a wastewater treatment plant that serves an existing mobile home park. Middletown Water Co. has a reservoir located upstream from the discharge that has no required minimum release rate, so it is possible for the stream to be dry during certain drought conditions when the reservoir is being used as a water source. The effluent limits were established to protect downstream users during these times. The facility is a package plant with a design capacity of 0.0145 mgd, and discharge to Iron Run which is classified for warm water fishes. The existing NPDES permit was issued on January 27, 2017 with an expiration date of January 31, 2022. The applicant submitted a renewal application to the Department on October 25, 2021. The permittee is currently operating under the terms and conditions in the existing permit pending Department action on the renewal application. A topographic map showing the discharge location is presented in attachment A.

1.1 Sludge use and disposal description and location(s):

Sludge is digested in an aerobic digester and hauled out by a licensed hauler periodically.

1.2 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

Approve	Deny	Signatures	Date
X		*J. Pascal Kwedza* J. Pascal Kwedza, P.E. / Environmental Engineer	October 7, 2022
X		Daniel W. Martin Daniel W. Martin, P.E. / Environmental Engineer Manager	November 1, 2022

Summary of Review

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.

1.3 Changes to the existing Permit

- Monitoring requirement for TKN, nitrate-nitrite, Total Nitrogen and Total Phosphorus has been revised to 2/year.
- Annual monitoring of E. coli has been added.

1.4 Existing Limitations and Monitoring Requirements

Discharge Parameter	DISCHARGE LIMITATIONS						MONITORING REQUIREMENTS	
	Mass Units			Concentrations			Minimum Measurement Frequency	Required Sample Type
	Total Monthly (lbs/mo)	Daily Maximum (lbs/day)	Total Annual (lbs/year)	Monthly Average (mg/l)	Daily Maximum (mg/l)	Inst. Maximum (mg/l)		
Flow (mgd)	Monitor & Report Avg	Monitor & Report	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	XXX	From 6.0 to 9.0 inclusive			1/day	Grab
D.O.	XXX	XXX	XXX	Minimum of 5.0 mg/l at all times			1/day	Grab
Total Residual Chlorine	XXX	XXX	XXX	0.5	XXX	1.63	1/day	Grab
Total Suspended Solids	XXX	XXX	XXX	30	XXX	60	2/month	8-hour comp
$CBOD_5$ (5/1 to 10/31)	XXX	XXX	XXX	10	XXX	20	2/month	8-hour comp
$CBOD_5$ (11/1 to 4/30)	XXX	XXX	XXX	20	XXX	40	2/month	8-hour comp
Fecal Coliform (5/1 to 9/30)	XXX	XXX	XXX	200	XXX	1000	2/month	Grab
Fecal Coliform (10/1 to 4/30)	XXX	XXX	XXX	2000	XXX	10000	2/month	Grab
Nitrate-Nitrite	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/quarter	8-Hr Composite
Total Nitrogen	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/quarter	8-Hr Composite
TKN	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/quarter	8-Hr Composite
Total Phosphorus	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/quarter	8-Hr Composite

1.3 Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.0145
Latitude	40° 12’ 13.96”	Longitude	76° 41’ 38.62”
Quad Name	Middletown	Quad Code	1732
Wastewater Description:	Sewage		
Receiving Waters	Iron Run (WWF)	Stream Code	09366
NHD Com ID	56404191	RMI	1.40
Drainage Area	6.49	Yield (cfs/mi^2)	
Q_{7-10} Flow (cfs)	0.65	Q_{7-10} Basis	
Elevation (ft)	74.564 m	Slope (ft/ft)	
Watershed No.	7-D	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	Siltation		
Source(s) of Impairment	Agriculture		
TMDL Status	Pending	Name	

Background/Ambient Data		Data Source
pH (SU)		
Temperature (°F)		
Hardness (mg/L)		
Other:		

Nearest Downstream Public Water Supply Intake	Middletown Water Company		
PWS Waters	Swatara Creek	Flow at Intake (cfs)	
PWS RMI		Distance from Outfall (mi)	2

Changes Since Last Permit Issuance:

1.3.1 Public Water Supply Intake

The nearest water supply intake is about 2 miles downstream at Columbia Borough, Lancaster County on the Susquehanna River by the Columbia Water Authority. No impact is expected from this discharge.

2.0 Treatment Facility Summary				
Treatment Facility Name: Crestview Village MHP				
WQM Permit No.	**Issuance Date**			
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Secondary	Extended Aeration	Hypochlorite	0.0145
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.0145		Not Overloaded	Aerobic digestion	Other WWTP

Changes Since Last Permit Issuance: None

2.1 The Existing Treatment System

The treatment plant consists of 2 flow Equalization tanks, a comminutor, 2 Aeration tanks, 3 clarifiers, (one not online), 2 sand filters (used alternatively), 1 dosing tank, 1 chlorine contact tank, and 1 sludge holding tank. Sodium hypochlorite is used for disinfection.

3.0 Compliance History

3.1 DMR Data for Outfall 001 (from August 1, 2021 to July 31, 2022)

Parameter	JUL-22	JUN-22	MAY-22	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21	SEP-21	AUG-21
Flow (MGD) Average Monthly	0.01474	0.01485	0.01954	0.02166	0.01696	0.0207	0.01759	0.01128	0.01140	0.01293	0.01918	0.01264
Flow (MGD) Daily Maximum	0.03322	0.0325	0.05616	0.05854	0.0235	0.05091	0.03283	0.01367	0.01589	0.02779	0.06078	0.02819
pH (S.U.) Minimum	7.1	7.1	6.8	7.0	7.0	6.8	6.8	6.9	7.1	7.0	6.9	6.9
pH (S.U.) Maximum	7.8	7.6	7.7	7.6	7.8	7.6	7.6	7.9	7.6	7.9	7.4	7.5
DO (mg/L) Minimum	6.0	6.0	6.9	6.7	6.8	7.0	7.2	7.0	7.0	7.0	6.0	6.1
TRC (mg/L) Average Monthly	0.23	0.15	0.49	0.22	0.23	0.23	0.21	0.21	0.2	0.19	0.13	0.2
TRC (mg/L) Instantaneous Maximum	0.68	0.39	0.49	0.65	0.87	0.51	0.49	0.45	0.49	0.51	0.35	0.49
CBOD5 (mg/L) Average Monthly	< 2	2.7	2.9	< 2	< 2.1	2.9	< 2	2.3	< 2	4.9	< 2	< 3.2
TSS (mg/L) Average Monthly	< 5	< 6	7	< 6	< 5	< 6	< 6	6.0	< 7	5	< 6	< 6
Fecal Coliform (CFU/100 ml) Geometric Mean	< 1	1	20	< 1	1	1	< 1	0.7	0.09	0.09	0.2	< 1
Fecal Coliform (CFU/100 ml) Instant. Maximum	< 1	1	206	< 1	1	1	1	9.0	< 1	1	1	< 1
Nitrate-Nitrite (mg/L) Average Quarterly		7.95			11.3			17.5			9.38	
Total Nitrogen (mg/L) Average Quarterly		< 8.95			< 12.3			< 18.5			10.4	
Ammonia (mg/L) Average Monthly	< 0.1	0.428	1.46	0.605	0.184	< 0.15	< 0.50	0.0987	0.111	0.059	0.1	0.133
TKN (mg/L) Average Quarterly		< 1			< 1			< 1			< 1.0	
Total Phosphorus (mg/L) Ave. Quarterly		2.2			1.9			2.9			8	

3.2 Summary of DMRs:

Discharge Monitoring Reports (DMRs) review for the facility for the last 12 months of operation presented on the table above indicate permit limits have been met consistently. No effluent violation occurred during the past 12 months

3.3 Summary of Inspections:

The facility has been inspected a couple of times during the past permit cycle. Inspection reports review for the facility during the period indicate permit limits have been met consistently. The following operation and maintenance recommendations were made during the most recent inspection on 3/12/22. Repair comminutor and put back into service, clean EQ tanks as normally scheduled, remove rag accumulations from air lines in aeration tanks, clean dosing tank and monitor for future cleanings to prevent solids carryover to sand filters. Maintain up-to-date repair/maintenance log. Follow, at minimum, the guidance provided in the SOPs for frequency of process control testing, such as settleability tests so that sludge can be wasted from the clarifiers at an appropriate frequency and volume to allow the plant to properly operate and continue to meet permit limits. Document process control results. Document sludge wasting from the clarifier by depth or time that can be calculated to gallons.

4.0 Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** .0145
Latitude 40º 12' 13.96" **Longitude** -76º 41' 38.62"
Wastewater Description: Sewage Effluent

4.2 Basis for Effluent Limitations

In general, the Clean Water Act(AWA) requires that the effluent limits for a particular pollutant be the more stringent of either technology-based limits or water quality-based limits. Technology-based limits are set according to the level of treatment that is achievable using available technology. A water quality-based effluent limit is designed to ensure that the water quality standards applicable to a waterbody are being met and may be more stringent than technology-based effluent limits.

4.2 Technology-Based Limitations

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

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

Comments: Weekly averages are not applicable to this discharge

4.3 Water Quality-Based Limitations

4.3.1 Receiving Stream

The receiving stream is Iron Run. According to 25 PA § 93.9o, this stream is protected for Warm Water Fishes (WWF) and Migratory fish. It is located in Drainage List O and State Watershed 7-D. A stream code of 09366 has been assigned to Iron Run. The secondary receiving stream is Swatara Creek which is also protected for WWF. According to the Department's *Pennsylvania Integrated Water Quality Monitoring and Assessment Report*, this stream is impaired and not supporting all of its assessed uses.

4.3.2 Streamflows

The Technical Support Document for Water Quality-Based Toxics Control (TSD) (EPA, 1991) and the Pennsylvania Water Quality Standards PA WQS) recommend the flow conditions for use in calculating water quality-based effluent limits (WQBELs) using steady-state modeling. The TSD and the PA WQS state that WQBELs intended to protect aquatic life uses should be based on the lowest seven-day average flow rate expected to occur once every ten years ($Q_{7\text{-}10}$) for chronic criteria and the lowest one-day average flow rate expected to occur once every ten years ($Q_{1\text{-}10}$) for acute criteria. However, because the chronic criterion for ammonia is a 30-day average concentration not to be exceeded more than once every three years, EPA has used the $Q_{30\text{-}10}$ for the chronic ammonia criterion instead of the $Q_{7\text{-}10}$. The $Q_{30\text{-}10}$ is a biologically based design flow intended to ensure an excursion frequency of once every three years for a 30-day average flow rate. These flows were determined by correlating by correlating with the yield of USGS gauging station No. 01573560 on Swatara Creek near Hershey. The $Q_{7\text{-}10}$ and drainage area at the gage is 67.7ft3/s and 483mi^2 respectively. The resulting yields are as

follows:

- Q_{7-10} = (67.7ft^3/s)/483 mi^2 = 0.1ft^3/s/mi^2
- Q_{30-10} / Q_{7-10} = 0.89
- Q_{1-10} / Q_{7-10} = 1.23

The drainage area at discharge calculated by streamStats = 6.49 mi^2

The Q_{7-10} at discharge = 6.49 mi^2 x 0.1 ft^3/s/mi^2 = 0.65 ft^3/s.

4.3.3 NH_3N Calculations

NH_3N calculations will be based on the Department's Implementation Guidance of Section 93.7 Ammonia Criteria, dated 11/4/97 (ID No. 391-2000-013). The following data is necessary to determine the instream NH_3N criteria used in the WQM model of the stream:

- Discharge pH = 6.9 (DMR median July - Sept)
- Discharge Temperature = 25 ^{o} C (default)
- Stream pH = 7.0 (default)
- Stream Temperature = 20 ^{o} C (default)
- Background NH_3-N = 0.0 (default)

4.3.4 $CBOD_5$

The attached result of WQM 7.0 stream model (attachment B) indicates that secondary treatment is adequate to protect the water quality of the stream, but the proximity of the downstream water intake dictated the imposition of a seasonal summer $CBOD_5$ limit of 10 mg/l and winter limit of 20 mg/l in the existing permit. Due to anti-backsliding restrictions and since the facility has consistently met this limit in the past it would be continued in this renewal.

4.3.5 NH_3-N

The attached result of the WQM 7.0 stream model also indicates that no limitation on NH_3-N as a monthly average is necessary to protect the aquatic life from toxicity effects. However, to check treatment efficiency 1/month monitoring of NH_3-N required in the existing permit will remain in the permit for the current permit renewal.

4.3.6 Dissolved Oxygen

The existing permit contains a limit of 5 mg/l for Dissolved Oxygen (DO). DEP's Technical Guidance for the Development and Specification of Effluent Limitations (362-0400-001, 10/97) suggests that either the adopted minimum stream D.O. criteria for the receiving stream or the effluent level determined through water quality modeling be used for the limit. Since the WQM 7.0 model was run using a minimum D.O. of 5.0 mg/l as well, this limit will be continued in the renewed permit with a daily monitoring requirement per DEP guidance.

4.3.7 Total Suspended Solids:

There are no water quality criteria for TSS. A limit of 30 mg/l is the required minimum level of effluent quality attainable by secondary treatment as defined in EPA's 40 CFR Chapter 1, Part 133, Section 133.102(b) in the permit remain.

4.3.8 Fecal Coliform and E. coli

The existing Fecal Coliform limit is consistent with the technology limits recommended in 92a.47(a)(4) and (a)(5) and will remain in the permit. In March of 2021, EPA approved DEP's Triennial Review of Water Quality Standards, which included a new swimming season criterion for E. coli. As a result, DEP is including monitoring requirements for E. Coli in new and renewed sewage permits above 2000gpd. Monitoring frequency is based on annual average flow as follows: 1/month for design flows >= 1 MGD, 1/quarter for design flows >= 0.05 and < 1 MGD and 1/year for design flows of 0.002 – 0.05 MGD. Your discharge of 0.0145 MGD requires 1/year monitoring as included in the permit.

4.3.9 Chesapeake Bay Strategy

The Department formulated a strategy to comply with the Chesapeake Bay nutrient TMDL requirements for PA. Sewage discharges have been prioritized based on their delivered TN loadings to the Bay. The highest priority (Phases 1, 2, and 3) dischargers will receive annual loading caps based on their design flow on August 29, 2005 and concentrations of 6 mg/l TN and 0.8 mg/l TP. These limits may be achieved through a combination of treatment technology, credits, or offsets. Phase 4 (0.2 -0.4mgd) and Phase 5(below 0.2mdg) will be required to monitor and report TN and TP during permit renewal. Any facility in Phases 4 and 5 that undergoes expansion is subjected to cap load right away. This facility is classified as a phase 5 and has been monitoring Total Phosphorus, Nitrate-Nitrite as N, Total Kjeldahl Nitrogen and Total Nitrogen quarterly. A reduced monitoring frequency of twice per year will be required during this permit cycle for Total Phosphorus, Total Nitrogen, Nitrate-Nitrite as N, and Total Kjeldahl Nitrogen. The quarterly monitoring in the previous permit produced enough data for Total Phosphorus, Total Nitrogen, Nitrate-Nitrite as N, and Total Kjeldahl Nitrogen to support a reduced monitoring frequency.

4.3.10 Total Residual Chlorine:

The attached TRC results utilize the equations and calculations as presented in the Department's May 1, 2003 Implementation Guidance for Total Residual Chlorine (TRC) (ID No. 391-2000-015) for developing chlorine limitations. The Guidance references Chapter 92a, Section 92a.48 (b) which establishes a standard BAT limit of 0.5 mg/l unless a facility-specific BAT has been developed. The attached results presented in attachment C indicates that, a technology limit of 0.5 mg/l as a monthly average and 1.63 mg/l IMAX would be needed to prevent toxicity concerns. This limit is consistent with the existing permit and the facility is meeting this limit.

4.3.11 Toxics

A reasonable potential (RP) analysis was done for pollutants in the discharge. The discharge consists entirely of domestic wastewater with no pollutants of concern that needs further analysis.

5.0 Other Requirements

5.1 Anti-backsliding

Not applicable to this permit

5.2 Stormwater:

No storm water outfall is associated with this facility

5.3 Special Permit Conditions

The permit contains the following special conditions:

Stormwater Prohibition, Approval Contingencies, Management of collected screenings, slurries, sludges and other solids and Chlorine minimization.

5.4 Anti-Degradation (93.4)

The effluent limits for this discharge 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. No High-Quality Waters are impacted by this discharge. No Exceptional Value Waters are impacted by this discharge.

5.5 Class A Wild Trout Fisheries

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

5.6 303d Listed Streams:

The discharge is located on a 303d listed stream segment as impaired for aquatic life due siltation from agriculture. No further action is warranted at this time.

5.7 Basis for Effluent and Surface Water Monitoring

Section 308 of the CWA and federal regulation 40 CFR 122.44(i) require monitoring in permits to determine compliance with effluent limitations. Monitoring may also be required to gather effluent and surface water data to determine if additional effluent limitations are required and/or to monitor effluent impacts on receiving water quality. The permittee is responsible for conducting the monitoring and for reporting results on Discharge Monitoring Reports (DMRs).

5.8 Effluent Monitoring Frequency

Monitoring frequencies are based on the nature and effect of the pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance. Permittees have the option of taking more frequent samples than are required under the permit. These samples can be used for averaging if they are conducted using EPA-approved test methods (generally found in 40 CFR 136) and if the Method Detection Limits are less than the effluent limits. The sampling location must be after the last treatment unit and prior to discharge to the receiving water. If no discharge occurs during the reporting period, "no discharge" shall be reported on the DMR.

6.0 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	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	5.0 Daily Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.63	1/day	Grab
CBOD5 Nov 1 - Apr 30	XXX	XXX	XXX	20	XXX	40	2/month	8-Hr Composite
CBOD5 May 1 - Oct 31	XXX	XXX	XXX	10	XXX	20	2/month	8-Hr Composite
TSS	XXX	XXX	XXX	30	XXX	60	2/month	8-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	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
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/year	Grab
Nitrate-Nitrite	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/6 months	8-Hr Composite
Total Nitrogen	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/6 months	Calculation
Ammonia	XXX	XXX	XXX	Report	XXX	XXX	1/month	8-Hr Composite

Outfall 001 , Continued (from Permit Effective Date through Permit Expiration Date)

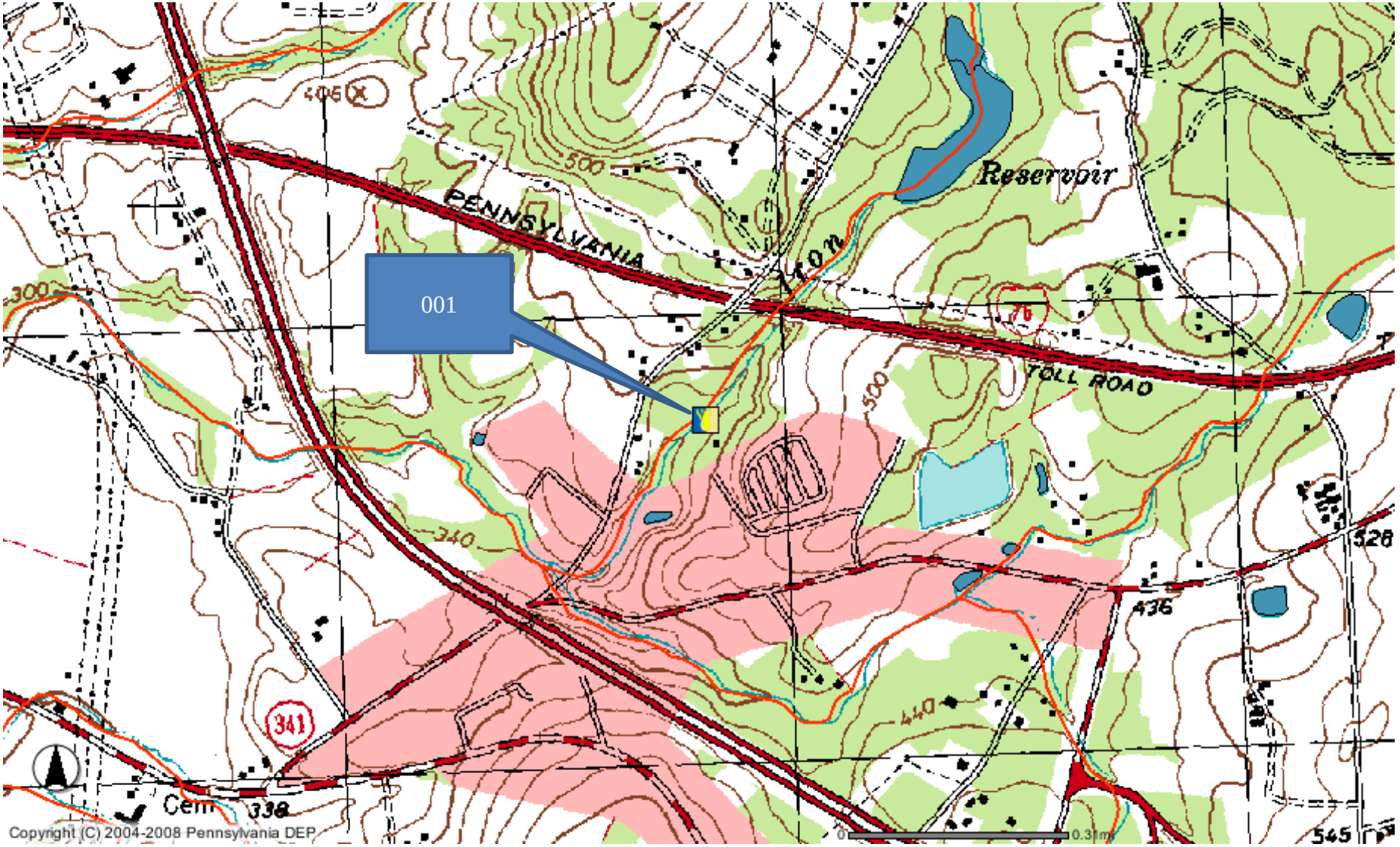
Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Maximum	Instant. Maximum		
TKN	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/6 months	8-Hr Composite
Total Phosphorus	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/6 months	8-Hr Composite

Compliance Sampling Location: At Outfall 001

6.0 Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment **B**)
☐	Toxics Management Spreadsheet (see Attachment)
☒	TRC Model Spreadsheet (see Attachment C)
☐	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: Establishing effluent limitation for individual sewage permit
☒	Other: WIP2 and Supplement

7. Attachments

A. Topographical Map



B. WQM Model Results

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
07D	9366	IRON 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)
1.400	Cresview MHP	PA0033057	0.014	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			5

Permit No. PA0033057

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
07D	9366	IRON RUN	1.400	380.00	6.49	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	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
Cresview MHP	PA0033057	0.0145	0.0145	0.0145	0.000	25.00	6.90

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

Permit No. PA0033057

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
07D	9366	IRON RUN	0.100	370.00	7.32	0.00000	2.00	☑

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	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	5.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

Permit No. PA0033057

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
07D	9366	IRON 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												
1.400	0.65	0.00	0.65	.0224	0.00146	.496	13.45	27.09	0.10	0.790	20.17	7.00
Q1-10 Flow												
1.400	0.58	0.00	0.58	.0224	0.00146	NA	NA	NA	0.09	0.841	20.19	7.00
Q30-10 Flow												
1.400	0.80	0.00	0.80	.0224	0.00146	NA	NA	NA	0.11	0.706	20.14	7.00

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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	0.89	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.23	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	5		

Permit No. PA0033057

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
07D	9366	IRON 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
1.400	Cresview MHP	16.56	50	16.56	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
1.400	Cresview MHP	1.87	25	1.87	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)		
1.40	Cresview MHP	25	25	25	25	5	5	0	0

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WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
07D	9366	IRON RUN

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
1.400	0.015	20.167	6.996
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
13.449	0.496	27.089	0.101
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.77	0.297	0.84	0.709
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
8.135	17.074	Owens	5
Reach Travel Time (days)			
0.790			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.079	2.70	0.79	8.22
0.158	2.64	0.75	8.22
0.237	2.58	0.71	8.22
0.316	2.52	0.67	8.22
0.395	2.46	0.63	8.22
0.474	2.40	0.60	8.22
0.553	2.35	0.56	8.22
0.632	2.29	0.53	8.22
0.711	2.24	0.50	8.22
0.790	2.19	0.48	8.22

Permit No. PA0033057

C. TRC Calculation Results

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

0.65	= Q stream (cfs)	0.5	= CV Daily
0.0145	= 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)	0	=Decay Coefficient (K)

Source	Reference	AFC Calculations	Reference	CFC Calculations
TRC	1.3.2.iii	WLA afc = 9.263	1.3.2.iii	WLA cfc = 9.023
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 3.452	5.1d	LTA_cfc = 5.245

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)**