pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0103641**
Facility Type	**Municipal**	APS ID	**1046876**
Major / Minor	**Minor**	Authorization ID	**1368024**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Wilmington Township Sewer Authority**	Facility Name	**Wilmington Township Sewer Authority Orchard Terrace STP**
Applicant Address	669 Wilson Mill Road	Facility Address	204 Orchard Terrace
	New Castle, PA 16105		New Castle, PA 16105
Applicant Contact	Tracey Deal, Secretary wilmingtontwp@comcast.net	Facility Contact	Jim Schneider, Chairman wilmingtontwp@comcast.net
Applicant Phone	(724) 946-2560	Facility Phone	(724) 946-2560
Client ID	36348	Site ID	262274
Ch 94 Load Status	Not Overloaded	Municipality	Wilmington Township
Connection Status	No Limitations	County	Lawrence County
Date Application Received	August 30, 2021	EPA Waived?	Yes
Date Application Accepted	September 2, 2021	If No, Reason	-
Purpose of Application	Renewal of an existing NPDES Permit for an existing discharge of treated sanitary wastewater from a Publicly Owned Treatment Works (POTW).		

Summary of Review

Act 14 - Proof of Notification was submitted and received.

A Part II Water Quality Management permit is not required at this time.

The applicant should be able to meet the limits of this permit, which will protect the uses of the receiving stream.

I. OTHER REQUIREMENTS:

A. Stormwater into sewers
B. Right of way
C. Solids handling
D. Effluent Chlorine Optimization and Minimization

SPECIAL CONDITIONS:

II. Solids Management

There is 1 open violation in EFACTS associated with the subject Client ID (36348) as of 8/2/2022 (see Attachment 1).

Approve	Deny	Signatures	Date
X		Stephen A. McCauley Stephen A. McCauley, E.I.T. / Environmental Engineering Specialist	8/2/2022 AJP 8/2/2022
X		 Vacant / Environmental Engineer Manager	Okay to Draft JCD 8/8/2022

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.042
Latitude	40º 05' 53.00"	Longitude	-80º 20' 56.00"
Quad Name	-	Quad Code	-
Wastewater Description:	Sewage Effluent		
Receiving Waters	Unnamed Tributary to the Little Neshannock Creek (TSF)	Stream Code	UNT to 35515
NHD Com ID	130032044	RMI	1.53
Drainage Area	0.75 mi^2	Yield (cfs/mi^2)	0.032
Q_{7-10} Flow (cfs)	0.024	Q_{7-10} Basis	previously calculated
Elevation (ft)	1140	Slope (ft/ft)	0.0251
Watershed No.	20-A	Chapter 93 Class.	TSF
Existing Use	-	Existing Use Qualifier	-
Exceptions to Use	-	Exceptions to Criteria	-
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment	-		
Source(s) of Impairment	-		
TMDL Status	-	Name	-

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

Nearest Downstream Public Water Supply Intake	Beaver Falls Municipal Authority - Eastvale		
PWS Waters	Beaver River	Flow at Intake (cfs)	561
PWS RMI	5.0	Distance from Outfall (mi)	30.0

Sludge use and disposal description and location(s): Sludge is hauled to the Mahoning Township WWTP (PA0240095), where it ends up at an approved landfill.

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.

Narrative: This Fact Sheet details the determination of draft NPDES permit limits for an existing discharge of 0.042 MGD of treated sewage from an existing Publicly Owned Treatment Works (POTW) in Wilmington Township, Lawrence County.

Permitted treatment consists of: (WQM Permit no. 3790401) Two extended aeration tanks, two final clarifiers, two aerobic digesters, gas chlorine disinfection with two contact tanks, tablet sodium sulfite dechlorination, and post aeration.

1. Streamflow:

Unnamed Tributary to the Little Neshannock Creek at Outfall 001:

Yieldrate:	0.032	cfsm	previous WQPRs
Drainage Area:	0.75	sq. mi.	previous WQPRs
% of stream allocated:	100%	Basis:	No nearby discharges
Q_{7-10}:	0.024	cfs	calculated

2. Wasteflow:

Maximum discharge: 0.042 MGD = 0.065 cfs

Runoff flow period: 24 hours Basis: Runoff flow for a Municipal STP

There is less than 3 parts stream flow (Q7-10) to 1 part effluent (design flow) at the discharge point. However, since this is an existing discharge, the more stringent treatment requirements cannot be achieved, and the receiving stream is not impaired by the discharge, the treatment requirements in document number 391-2000-014, titled, "Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers", dated April 12, 2008, will not be implemented in this NPDES Permit renewal.

Flow will be required to be monitored as authorized under Chapter 92a.61, and as recommended in the SOP.

3. Parameters:

The following parameters were evaluated: pH, Total Suspended Solids, Fecal Coliform, Phosphorus, NH_3-N, $CBOD_5$, Dissolved Oxygen, and Total Residual Chlorine.

a. pH

Between 6.0 and 9.0 at all times

Basis: Application of Chapter 93.7 technology-based limits

The measurement frequency was previously set to 3/day. It will be set to 1/day as recommended in the SOP, based on Table 6-3 in the "Technical Guidance for the Development and Specification of Effluent Limitations" (362-0400-001).

b. Total Suspended Solids

Limits are 30.0 mg/l as a monthly average and 60.0 mg/l as an instantaneous maximum.

Basis: Application of Chapter 92a47 technology-based limits.

c. Fecal Coliform

05/01 - 09/30:	200/100ml	(monthly average geometric mean)
	1,000/100ml	(instantaneous maximum)
10/01 - 04/30:	2,000/100ml	(monthly average geometric mean)
	10,000/100ml	(instantaneous maximum)

Basis: Application of Chapter 92a47 technology-based limits

d. E. Coli

Monitoring was added for E. Coli at a frequency of 1/year.

Basis: Application of Chapter 92a.61 as recommended by the SOP for flows between 0.002 MGD and 0.05 MGD.

e. Total Phosphorus

☒ Limit not necessary

Basis: Chapter 96.5 does not apply. However, the previous monitoring for Total Phosphorus will be retained in accordance with the SOP, based on Chapter 92a.61.

☐ Limit necessary due to:

☐ Discharge to lake, pond, or impoundment
☐ Discharge to stream

Basis N/A

f. Total Nitrogen

The previous monitoring for Total Nitrogen will be retained in accordance with the SOP, based on Chapter 92a.61.

g. Ammonia-Nitrogen (NH_3-N)

Median discharge pH to be used: 7.2 Standard Units (S.U.)

Basis: Average pH value from DMR summary

Discharge temperature: 25°C (default value used in the absence of data)

Median stream pH to be used: 7.0 Standard Units (S.U.)

Basis: default value used in the absence of data

Stream Temperature: 25˚C (default value used for TSF modeling)

Background NH_3-N concentration: 0.1 mg/l

Basis: Default value.

Calculated NH_3-N Summer limits: 1.9 mg/l (monthly average)
3.8 mg/l (instantaneous maximum)

Calculated NH_3-N Winter limits: 5.7 mg/l (monthly average)
11.4 mg/l (instantaneous maximum)

Result: WQ modeling resulted in the calculated summer limits above (see Attachment 2), which are less restrictive than the limits calculated in the previous NPDES Permit. The winter limits are calculated as three times the summer limits. The newly calculated limits are still less restrictive than the previous limits, which are attainable, so they will be retained.

h. $CBOD_5$

Median discharge pH to be used: 7.2 Standard Units (S.U.)

Basis: Average pH value from DMR summary

Discharge temperature: 25°C (default value used in the absence of data)

Median stream pH to be used: 7.0 Standard Units (S.U.)

Basis: default value used in the absence of data

Stream Temperature: 25˚C (default value used for TSF modeling)

Background $CBOD_5$ concentration: 2.0 mg/l

Basis: Default value

Calculated $CBOD_5$ limits: 25.0 mg/l (monthly average)
50.0 mg/l (instantaneous maximum)

Result: WQ modeling resulted in the calculated summer limits above (see Attachment 1), which are the same as the previous NPDES Permit and will be retained.

i. Influent Total Suspended Solids and BOD_5

Monitoring for these two parameters will be retained as recommended in the SOP for POTWs, as authorized under Chapter 92a.61.

j. Dissolved Oxygen (DO)

- ☐ 4.0 mg/l - minimum desired in effluent to protect all aquatic life.
- ☒ 5.0 mg/l - required in effluent for CWF, WWF, or TSF based on WQ Model.
- ☐ 6.0 mg/l - minimum required due to discharge going to a drainage swale or ditch.
- ☐ 8.0 mg/l - required due to discharge going to a naturally reproducing salmonid stream

Discussion: A Dissolved Oxygen technology-based minimum of 5.0 mg/l is recommended by the WQ Model (see Attachment 2), and the SOP, based on Chapter 93.7, under the authority of Chapter 92a.61. The Dissolved Oxygen minimum of 5.0 mg/l is the same as in the previous permit so it will be retained with this renewal.

The measurement frequency was previously set to 3/day. It will be set to 1/day as recommended in the SOP, based on Table 6-3 in the "Technical Guidance for the Development and Specification of Effluent Limitations" (362-0400-001).

k. Total Residual Chlorine (TRC)

☐ TRC limits: 0.063 mg/l (monthly average)
0.205 mg/l (instantaneous maximum)

Basis: The calculated TRC monthly average limit above (see Attachment 3) is more restrictive than in the previous permit and will be set with this renewal. The new limit should be attainable. The previous instantaneous maximum limit of 0.11 mg/l is more restrictive than the limit above so it will be retained.

The measurement frequency was previously set to 3/week. It will be set to 1/day as recommended in the SOP, based on Table 6-3 in the "Technical Guidance for the Development and Specification of Effluent Limitations" (362-0400-001).

☒ No limit necessary

Basis: N/A

4. Reasonable Potential Analysis:

A Reasonable Potential Analysis was not performed in accordance with State practices for Outfall 001 by the Department's Toxics Management Spreadsheet due to a lack of non-sewage data.

5. Reasonable Potential for Downstream Public Water Supply (PWS):

The Reasonable Potential Analysis above does not calculate limits for parameters that are based on PWS criteria (TDS, Chloride, Bromide, and Sulfate). However, since no non-sewage sample data was provided, no calculations were performed.

Nearest Downstream potable water supply (PWS): Beaver Falls Municipal Authority - Eastvale

Distance downstream from the point of discharge: 30.0 miles (approximate)

☒ No limits necessary

☐ Limits needed

Basis: Significant dilution available.

6. Anti-Backsliding:

Since all the permit limits in this renewal are the same or more restrictive than the previous NPDES Permit, anti-backsliding is not applicable.

7. Flow Information:

100% of the flow comes from the Wilmington Township, which is a 100% separate sewer system.

8. Attachment List:

Attachment 1 - WMS Open Violations by Client
Attachment 2 - WQ Modeling Printouts
Attachment 3 - TRC_Calc Spreadsheet

(The Attachments above can be found at the end of this document)

Compliance History

DMR Data for Outfall 001 (from June 1, 2021 to May 31, 2022)

Parameter	MAY-22	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21	SEP-21	AUG-21	JUL-21	JUN-21
Flow (MGD) Average Monthly	0.0346	0.0356	0.0365	0.0378	0.0224	0.0241	0.0216	0.0192	0.0313	0.037	0.0327	0.021
Flow (MGD) Daily Maximum	0.0555	0.0586	0.0577	0.0673	0.0316	0.0389	0.0257	0.0263	0.036	0.056	0.074	0.0263
pH (S.U.) Minimum	7.3	7.5	7.2	6.7	6.9	6.9	6.9	7.1	6.9	6.9	6.9	7.1
pH (S.U.) Maximum	8.0	8.2	7.9	7.7	7.3	7.4	7.4	7.6	7.7	7.8	7.6	7.5
DO (mg/L) Minimum	6.1	8.1	8.6	8.6	9.0	9.1	8.5	7.78	6.38	5.07	6.2	7.19
TRC (mg/L) Average Monthly	0.05	0.05	0.05	0.05	0.06	0.05	0.05	< 0.05	0.04	0.05	0.07	< 0.04
TRC (mg/L) Instantaneous Maximum	0.10	0.09	0.09	0.09	0.23	0.10	0.07	0.09	0.10	0.07	0.10	0.09
CBOD5 (lbs/day) Average Monthly	4.0	2.0	2.0	1.0	0.8	0.6	0.6	0.6	0.9	0.8	0.6	< 0.4
CBOD5 (lbs/day) Weekly Average	5.0	2	2.0	1	0.9	0.7	0.6	0.8	1.0	0.8	0.6	< 0.4
CBOD5 (mg/L) Average Monthly	11.6	6.28	5.05	5.41	3.78	2.84	3.08	4.31	5.26	2.71	2.43	< 2
CBOD5 (mg/L) Weekly Average	11.7	6.64	5.09	7.3	4.53	3.04	3.13	5.45	7.94	2.75	2.7	< 2
BOD5 (lbs/day) Influent Average Monthly	44	34	41	29	27132	34	22	39	79	33	46	56
BOD5 (mg/L) Influent Average Monthly	131	140	106	167	132	161	118	292	395	186	122	304
TSS (lbs/day) Average Monthly	7.0	3.0	3.0	2.0	2.0	2.0	1.0	0.9	< 1.0	2.0	1.0	< 1.0
TSS (lbs/day) Influent Average Monthly	17	15	15	19	17	19	8	34	32	27	43	30
TSS (lbs/day) Weekly Average	9.0	4.0	3.0	2.0	3.0	2.0	2.0	1.0	< 1.0	2.0	2.0	1.0
TSS (mg/L) Average Monthly	19.2	11	8.1	8.8	10.6	7	7.4	< 7.2	< 5.8	6.1	6.2	< 5
TSS (mg/L) Influent Average Monthly	54	62	36	103	82	87	44	257	147	155	115	156
TSS (mg/L) Weekly Average	20.8	13.6	10	9.4	13.8	9	8.6	9.4	6.6	6.2	6.6	5

Fecal Coliform (No./100 ml) Geometric Mean	15	5	< 5	50	188	12	70	< 11	1	17	3	4
Fecal Coliform (No./100 ml) Instantaneous Maximum	20	6	30	500	645	14	86	120	1	143	4	5
Total Nitrogen (mg/L) Average Monthly	11.1	7.06	9.92	9.66	973	9.32	445.2	21.9	18.8	33.2	11.5	10.1
Ammonia (lbs/day) Average Monthly	< 0.40	< 0.2	< 0.2	0.09	< 0.1	< 0.1	< 0.1	0.50	< 0.60	< 0.10	< 0.10	< 0.30
Ammonia (mg/L) Average Monthly	< 1.5	< 0.95	< 0.5	< 0.5	< 0.5	< 0.56	< 0.5	3.69	< 3.62	< 0.5	< 0.5	< 1.62
Total Phosphorus (mg/L) Average Monthly	1.84	0.736	1.35	2.65	1.7	1.97	2.25	3.02	2.69	3.55	2.31	2.05

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	1/week	Measured
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	5.0 Inst Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.063	XXX	0.11	1/day	Grab
CBOD5	8.8	14.0	XXX	25.0	40.0	50	2/month	8-Hr Composite
BOD5 Raw Sewage Influent	Report	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
TSS	10.5	15.8	XXX	30.0	45.0	60	2/month	8-Hr Composite
TSS Raw Sewage Influent	Report	XXX	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
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/year	Grab
Total Nitrogen	Report	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	1.1	XXX	XXX	3.0	XXX	6	2/month	8-Hr Composite
Ammonia-Nitrogen May 1 - Oct 31	0.35	XXX	XXX	1.0	XXX	2	2/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	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Total Phosphorus	Report	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite

Compliance Sampling Location: at Outfall 001, after disinfection.

Flow is monitor only based on Chapter 92a.61. The limits for pH and Dissolved Oxygen are technology-based on Chapter 93.7. The Total Residual Chlorine (TRC) limits are water quality-based on Chapter 93.7. The limits for $CBOD_5$, Total Suspended Solids, and Fecal Coliform are technology based on Chapter 92a.47. Monitoring for influent BOD5 and influent Total Suspended Solids is based on Chapter 92a.61. Monitoring for E. Coli, Total Nitrogen, and Total Phosphorus is based on Chapter 92a.61. The limits for Ammonia-Nitrogen are water quality-based on Chapter 93.7.

Attachment 1

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

WATER MANAGEMENT SYSTEM
OPEN VIOLATIONS BY CLIENT

Client ID: 36348
Client: All

Open Violations: 1

CLIENT ID	CLIENT	PF ID	FACILITY	PF KIND	PF STATUS	INSP PROGRAM
36348	WILMINGTON TWP SEW AUTH	280884	WILMINGTON TWP SA ORCHARD TERR	Sewage Publicly Owned (Muni)	Active	WPC NPDES

PROGRAM SPECIFIC ID	INSP ID	VIOLATION ID	INSPECTION CATEGORY	VIOLATION DATE	VIOLATION CODE	VIOLATION	PF INSPECTOR	INSP REGION
PA0103641	3344534	950768	PF	04/08/2022	92A.44	NPDES - Violation of effluent limits in Part A of permit	PUDLICK,DAN	NWRO

Attachment 2

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
20A	35515	NESHANNOCK 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)
1.530	Wilmington Twp	PA0103641	0.042	CBOD5	25		
				NH3-N	1.95	3.9	
				Dissolved Oxygen			5

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
20A	35515	NESHANNOCK CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
1.530	0.042	25.000	7.136
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
3.888	0.347	11.217	0.066
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
18.80	1.257	1.42	1.029
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
5.685	28.081	Owens	5
Reach Travel Time (days)			
1.416			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.142	15.02	1.23	6.80
0.283	12.01	1.06	7.12
0.425	9.60	0.92	7.36
0.566	7.67	0.79	7.54
0.708	6.13	0.69	7.54
0.850	4.90	0.59	7.54
0.991	3.92	0.51	7.54
1.133	3.13	0.44	7.54
1.275	2.50	0.38	7.54
1.416	2.00	0.33	7.54

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		

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
20A	35515	NESHANNOCK CREEK	**1.530**	1140.00	0.75	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	0.032	0.00	0.00	0.000	0.000	0.0	0.00	0.00	25.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Wilmington Twp	PA0103641	0.0420	0.0000	0.0000	0.000	25.00	7.20

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	4.00	7.54	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
20A	35515	NESHANNOCK CREEK	**0.000**	937.00	1.64	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	0.032	0.00	0.00	0.000	0.000	0.0	0.00	0.00	25.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

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

SWP Basin	Stream Code	Stream Name
20A	35515	NESHANNOCK 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
1.530	Wilmington Twp	9.53	11.79	9.53	11.79	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
1.530	Wilmington Twp	1.3	1.95	1.3	1.95	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)		
1.53	Wilmington Twp	25	25	1.95	1.95	5	5	0	0

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
20A	35515	NESHANNOCK 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												
1.530	0.02	0.00	0.02	.065	0.02513	.347	3.89	11.22	0.07	1.416	25.00	7.14
Q1-10 Flow												
1.530	0.02	0.00	0.02	.065	0.02513	NA	NA	NA	0.06	1.500	25.00	7.15
Q30-10 Flow												
1.530	0.03	0.00	0.03	.065	0.02513	NA	NA	NA	0.07	1.345	25.00	7.12

Attachment 3

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

0.024	= Q stream (cfs)	0.5	= CV Daily
0.042	= 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 =	0.137	1.3.2.iii	WLA cfc =	0.126
PENTOXSD TRG	5.1a	LTAMULT afc =	0.373	5.1c	LTAMULT cfc =	0.581
PENTOXSD TRG	5.1b	LTA_afc=	0.051	5.1d	LTA_cfc =	0.073

Source		Effluent Limit Calculations		
PENTOXSD TRG	5.1f	AML MULT =	1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) =	0.063	AFC
		INST MAX LIMIT (mg/l) =	0.205	

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)**