pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0221007**
Facility Type	**Municipal**	APS ID	**1050816**
Major / Minor	**Minor**	Authorization ID	**1374730**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Volant Borough**	Facility Name	**Volant Borough STP**
Applicant Address	525 Main Street	Facility Address	530 Main Street
	Volant, PA 16156		Volant, PA 16156
Applicant Contact	Jeffrey Staul, STP Operator jhstaul@hotmail.com	Facility Contact	Jeffrey Staul, STP Operator jhstaul@hotmail.com
Applicant Phone	(724) 813-4888	Facility Phone	(724) 813-4888
Client ID	64433	Site ID	256998
Ch 94 Load Status	Not Overloaded	Municipality	Volant Borough
Connection Status	No Limitations	County	Lawrence County
Date Application Received	October 26, 2021	EPA Waived?	Yes
Date Application Accepted	November 2, 2021	If No, Reason	-

Purpose of Application: Renewal of an NPDES Permit for an existing discharge of treated sanitary wastewater.

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 are no open violations in efacts associated with the subject Client ID (64433) as of 6/21/2023. *CWY 7/7/2023*

Approve	Deny	Signatures	Date
X		Stephen A. McCauley Stephen A. McCauley, E.I.T. / Environmental Engineering Specialist	6/21/2023
X		Chad W. Yurisic Chad W. Yurisic, P.E. / Environmental Engineer Manager	7/7/2023

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.035
Latitude	41º 06' 41.00"	Longitude	-80º 15' 38.00"
Quad Name	-	Quad Code	-
Wastewater Description:	Sewage Effluent		
Receiving Waters	Neshannock Creek (TSF)	Stream Code	35515
NHD Com ID	130032152	RMI	14.82
Drainage Area	194	Yield (cfs/mi^2)	0.0558
Q_{7-10} Flow (cfs)	10.82	Q_{7-10} Basis	calculated
Elevation (ft)	1024	Slope (ft/ft)	0.00188
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	Pennsylvania American Water Company - Ellwood City		
PWS Waters	Beaver River	Flow at Intake (cfs)	292.5
PWS RMI	13.0	Distance from Outfall (mi)	27.0

Sludge use and disposal description and location(s): All sludge is taken to the Mahoning Township WWTP (PA0240095), where it is ultimately disposed of 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 0.035 MGD of treated sewage from a municipal STP in Volant Borough, Lawrence County.

Treatment permitted under Water Quality Management Permit No. 3793406 consists of the following: A 40,000 gallon aeration tank, two final 3,333 gallon settling tanks, and tablet chlorination with a 1,077 gallon contact tank. Sludge is stored in a 6,000 gallon aerated holding tank followed by two 500 square foot sludge drying beds. The sludge drying beds are currently not being used.

1. Streamflow:

Cool Spring Creek near Mercer - USGS Stream Gage 03104600 (from previous fact sheet):

Q_{7-10}:	2.2	cfs	(USGS StreamStats)
Drainage Area:	34.7	sq. mi.	(USGS StreamStats)
Yieldrate:	0.0634	cfsm	calculated

Neshannock Creek @ East Brook Station - USGS Stream Gage 03105000 (from previous fact sheet):

Q_{7-10}:	11.0	cfs	(USGS StreamStats)
Drainage Area:	228	sq. mi.	(USGS StreamStats)
Yieldrate:	0.0482	cfsm	calculated

Conneaut Outlet at Outfall 001:

Yieldrate:	0.0558	cfsm	Average of values calculated above
Drainage Area:	194	sq. mi.	(USGS StreamStats)
% of stream allocated:	100%	Basis:	No nearby discharges
Q_{7-10}:	10.82	cfs	calculated

2. Wasteflow:

Maximum discharge: 0.035 MGD = 0.054 cfs

Runoff flow period: 24 hours Basis: Runoff flow for municipal STPs

The calculated stream flow (Q7-10) is greater than 3 times the permitted discharge flow. In accordance with the SOP, 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, were not evaluated for this facility.

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, E. Coli, Total Phosphorus, Total Nitrogen, 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 will be increased from 3/week 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 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 greater than 0.0002 MGD and less than 0.05 MGD.

e. Phosphorus

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. However, the monitoring frequency will be reduced from 2/month to 1/year since the receiving stream is not impaired, per the SOP.

f. Total Nitrogen

The previous monitoring for Total Nitrogen will be retained in accordance with the SOP, based on Chapter 92a.61. However, the monitoring frequency will be reduced from 2/month to 1/year since the receiving stream is not impaired, per the SOP.

g. Ammonia-Nitrogen (NH_3-N)

Median discharge pH to be used:	6.7	Standard Units (S.U.)
	Basis:	eDMR data from previous 12 months
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 WWF modeling)
Background NH_3-N concentration:	0.0	mg/l
	Basis:	Default value
Calculated NH_3-N Summer limits:	25.0	mg/l (monthly average)
	50.0	mg/l (instantaneous maximum)

Calculated NH_3-N Winter limits: 25.0 mg/l (monthly average)
50.0 mg/l (instantaneous maximum)

Result: WQ modeling resulted in the summer NH3-N limits above (see Attachment 1). The winter limits are calculated as three times the summer limits, but since the technology-based limits are more protective, they will be used. These limits are the same as in the previous permit and will be retained.

h. $CBOD_5$

Median discharge pH to be used: 6.7 Standard Units (S.U.)

Basis: eDMR data from previous 12 months

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 WWF 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 CBOD5 limits above (see Attachment 1). These limits are the same as in the previous 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)

The technology-based minimum of 4.0 mg/l is recommended by the WQ Model (see Attachment 1) and the SOP based on Chapter 93.7, under the authority of Chapter 92a.61.

The measurement frequency will be increased from 3/week 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)

Calculated limits: 0.5 mg/l (monthly average)
1.6 mg/l (instantaneous maximum)

Basis: The TRC limits above were calculated using the Department’s TRC Calculation Spreadsheet (see Attachment 2). The limits are the same as the previous NPDES Permit and will be retained.

The measurement frequency will be increased from 3/week 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).

4. Reasonable Potential Analysis for Receiving Stream:

A Reasonable Potential Analysis was not performed in accordance with State practices using the Department's Toxics Management Spreadsheet since no sampling other than sewage-related parameters was performed for this facility with the renewal application.

Result: N/A

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

The Department's Toxics Management Spreadsheet does not calculate limits for parameters that are based on PWS criteria (TDS, Chloride, Bromide, and Sulfate). However, since no sample data was provided, mass-balance calculations were not performed.

Nearest Downstream potable water supply (PWS): Pennsylvania American Water Company - Ellwood City
Distance downstream from the point of discharge: 27.0 miles (approximate)

Result: No limits are necessary as significant dilution is available

6. Flow Information:

The flow to the Volant Borough STP consists of 100% from the Volant Borough. All the sewers in the Volant Borough STP system are separate sewers.

7. 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.

8. Attachment List:

Attachment 1 - WQ Modeling Printouts

Attachment 2 - TRC_Calc Spreadsheet

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

Compliance History

DMR Data for Outfall 001 (from May 1, 2022 to April 30, 2023)

Parameter	APR-23	MAR-23	FEB-23	JAN-23	DEC-22	NOV-22	OCT-22	SEP-22	AUG-22	JUL-22	JUN-22	MAY-22
Flow (MGD) Average Monthly	0.00458	0.00472	0.004	0.00620	0.004	0.003	0.003	0.003	0.003	0.005	0.0061	0.0042
pH (S.U.) Minimum	6.06	7.19	7.1	7.22	6.87	6.7	6.9	7.1	6.4	6.2	6.3	6.5
pH (S.U.) Maximum	7.38	7.51	7.6	7.64	7.46	7.4	7.7	7.5	7.3	7.1	7.6	7.2
DO (mg/L) Minimum	7.07	7.05	5.4	5.94	4.8	5.4	4.2	4.2	4.2	4.1	4.0	4.0
TRC (mg/L) Average Monthly	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3
TRC (mg/L) Instantaneous Maximum	0.44	0.67	0.5	0.52	0.5	0.6	0.5	0.4	0.4	0.4	0.5	0.5
CBOD5 (lbs/day) Average Monthly	< 0.1	0.01	< 0.1	0.2	< 0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1
CBOD5 (lbs/day) Weekly Average	< 0.1	0.02	< 0.1	0.4	< 0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1
CBOD5 (mg/L) Average Monthly	< 3.1	< 3.0	< 3	< 3	< 3	< 3.0	< 3	< 3	< 3	< 3.0	< 3	< 3
CBOD5 (mg/L) Weekly Average	3.2	< 3	< 3	< 3	< 3	< 3.0	< 3	< 3	< 3	< 3.0	< 3	< 3.0
BOD5 (lbs/day) Influent Average Monthly	5	7	5	10	5.0	3.4	4.8	2.3	4.9	7.3	6.2	8.4
BOD5 (mg/L) Influent Average Monthly	147	161	147	135	148	128	187	103	230	< 130	157	198
TSS (lbs/day) Average Monthly	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.1
TSS (lbs/day) Influent Average Monthly	5	5	4	7	3.3	3.4	2.2	2.2	2.6	6.3	5.9	4.3
TSS (lbs/day) Weekly Average	< 0.1	< 0.2	< 0.1	< 0.4	0.2	0.1	0.1	0.1	0.1	0.6	0.2	0.1
TSS (mg/L) Average Monthly	< 3.0	< 3	< 3.0	< 3.5	< 4.0	< 3	< 3	< 3	< 3	6	4	< 3
TSS (mg/L) Influent Average Monthly	136	107	121	96	96	109	84	106.5	124.5	112	149	101.5
TSS (mg/L) Weekly Average	< 3.0	< 3	< 3.0	4.0	5.0	< 3	5	< 3	< 3	9	5	< 3

Fecal Coliform (No./100 ml) Geometric Mean	3	11	1	2	9	33	17	11	13	4	6	< 2
Fecal Coliform (No./100 ml) Instantaneous Maximum	8	13	1	4	37	152	286	18	42	8	19	5
Total Nitrogen (mg/L) Average Monthly	32.9	37	35.3	27.5	36	28	34	32.4	38.1	38	33	43
Total Phosphorus (mg/L) Average Monthly	2.71	2.97	2.7	1.32	2	2.1	3.0	3.1	5.0	4.9	3.0	4.1

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	XXX	XXX	XXX	XXX	XXX	1/week	Measured
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	9.0 Daily Max	XXX	1/day	Grab
DO	XXX	XXX	4.0 Daily Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
CBOD5	7.0	11.7	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 Raw Sewage Influent	Report	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
TSS	8.8	13.1	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
E. Coli (No./100 ml)	XXX	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	Grab
Total Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	1/year	8-Hr Composite
Ammonia-Nitrogen	Report	Report	XXX	Report	Report	XXX	2/month	8-Hr Composite
Total Phosphorus	XXX	XXX	XXX	Report	XXX	XXX	1/year	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 limits for TRC, $CBOD_5$, Total Suspended Solids, and Fecal Coliforms are technology-based on Chapter 92a.47. Monitoring for NH3-N, E. Coli, Total Nitrogen, and Total Phosphorus is based on Chapter 92a.61.

Attachment 1

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)
14.820	Volant Boro	PA0221007	0.035	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			4

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
14.820	0.035	20.025	6.998
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
57.343	0.821	69.834	0.232
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.11	0.065	0.12	0.701
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
8.222	2.981	Tsivoglou	5
Reach Travel Time (days)			
0.451			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.045	2.11	0.12	8.24
0.090	2.10	0.12	8.24
0.135	2.10	0.11	8.24
0.180	2.09	0.11	8.24
0.225	2.08	0.11	8.24
0.270	2.08	0.10	8.24
0.315	2.07	0.10	8.24
0.361	2.07	0.10	8.24
0.406	2.06	0.09	8.24
0.451	2.05	0.09	8.24

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	**14.820**	1024.00	194.00	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	0.056	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
Volant Boro	PA0221007	0.0350	0.0000	0.0000	0.000	25.00	6.70

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	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
20A	35515	NESHANNOCK CREEK	**13.110**	1007.00	196.00	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	0.056	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	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
14.820	Volant Boro	16.76	50	16.76	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
14.820	Volant Boro	1.89	25	1.89	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)		
14.82	Volant Boro	25	25	25	25	4	4	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												
14.820	10.86	0.00	10.86	.0541	0.00188	.821	57.34	69.83	0.23	0.451	20.02	7.00
Q1-10 Flow												
14.820	6.95	0.00	6.95	.0541	0.00188	NA	NA	NA	0.18	0.578	20.04	7.00
Q30-10 Flow												
14.820	14.78	0.00	14.78	.0541	0.00188	NA	NA	NA	0.28	0.380	20.02	7.00

Attachment 2

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

10.8	= Q stream (cfs)	0.5	= CV Daily
0.035	= 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 = 63.648	1.3.2.iii	WLA cfc = 62.044
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 23.717	5.1d	LTA_cfc = 36.070

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)**