pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Application Type	**Renewal**	Application No.	**PA0084492**
Facility Type	**Non-Municipal**	APS ID	**929657**
Major / Minor	**Minor**	Authorization ID	**1235142**

Applicant and Facility Information

Applicant Name	**Halifax Village LLC**	Facility Name	**Halifax Village**
Applicant Address	PO Box 375	Facility Address	S Elmer Avenue
	Gap, PA 17527		Halifax, PA 17032
Applicant Contact	John & Zonya Stoltzfus	Facility Contact	John Stoltzfus
Applicant Phone	(484) 880-1328	Facility Phone	(717) 692-4557
Client ID	332334	Site ID	1128
Ch 94 Load Status	Not Overloaded	Municipality	Halifax Township
Connection Status		County	Dauphin
Date Application Received	July 2, 2018	EPA Waived?	Yes
Date Application Accepted	July 11, 2018	If No, Reason	

Purpose of Application: Permit renewal for discharge of treated sewage

Summary of Review

1.0 General Discussion

This factsheet supports the renewal of an existing NPDES permit for discharge of treated domestic sewage from a wastewater treatment plant that serves a mobile home community, Red Rose Motel and Engle Ford car dealership. The plant is designed for 0.062MGD to serve the mobile home community at built-out and the other contributors. The extended aeration package plant discharges to an unnamed tributary to Susquehanna River which is classified for warm water fishes(WWF) and migratory fishes(MF). The project was phased and the first phase of 0.031MGD was constructed. The NPDES was developed based on the built-out flow of 0.062MGD. A request for WQM permit modification is required prior to construction of the proposed additional 50 units in the future. The facility was transferred from the Stroheckers to Halifax Village LLC. during the past permit cycle. The existing NPDES permit was issued on November 21, 2013 with an effective date of December 1, 2013. The permit was transferred on January 23, 2017 with an expiration date of November 30, 2018. The applicant submitted a timely renewal application to the Department and 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 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

Approve	Deny	Signatures	Date
X		J. Pascal Kwedza, P.E. / Environmental Engineer	November 19, 2019
		Daniel W. Martin, P.E. / Environmental Engineer Manager	
		Maria D Bebenek, P.E./Program Manager	

Summary of Review

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.

1.2 Changes to the existing Permit

- Semi-annual monitoring of Total Phosphorus, Total Nitrogen, TKN and nitrate-Nitrite have been added
- IMAX for TRC is slightly more stringent

1.3 Existing Permit Limits and Monitoring Requirements

DISCHARGE LIMITATIONS							MONITORING REQUIREMENTS	
	Mass Units (lbs/day)		Concentrations (mg/l)					
Discharge Parameter	Average Monthly	Maximum Daily	Inst. Minimum	Average Monthly	Maximum Daily	Inst. Maximum	Monitoring Frequency	Sample Type
Flow (mgd)	Monitor & Report	Monitor & Report	XXX	XXX	XXX	XXX	continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
D.O.	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine	XXX	XXX	XXX	0.06	XXX	0.21	1/day	Grab
Total Suspended Solids	XXX	XXX	XXX	30	XXX	60	2/month	8-hour comp
$CBOD_5$	XXX	XXX	XXX	25	XXX	50	2/month	8-hour comp
NH3-N (5/1 to 10/31)	XXX	XXX	XXX	2.5	XXX	5.0	2/month	8-hour comp
NH3-N (11/1 to 4/30)	XXX	XXX	XXX	7.5	XXX	15	2/month	8-hour comp
Fecal Coliform (5/1 to 9/30)	XXX	XXX	XXX	200	XXX	1,000	2/month	Grab
Fecal Coliform (10/1 to 4/30)	XXX	XXX	XXX	2,000	XXX	10,000	2/month	Grab
Total Phosphorus	XXX	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	8-hour comp
Total Nitrogen	XXX	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	8-hour comp

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	.062
Latitude	40º 30' 27.71"	Longitude	-76º 57' 12.54"
Quad Name		Quad Code	
Wastewater Description:	Sewage Effluent		
Receiving Waters	Unnamed Tributary to Susquehanna River (WWF)	Stream Code	16877
NHD Com ID	54974407	RMI	0.29
Drainage Area	0.30 sq. mi	Yield (cfs/mi^2)	0.11
Q_{7-10} Flow (cfs)	0.033	Q_{7-10} Basis	USGS Gage Station
Elevation (ft)	440	Slope (ft/ft)	
Watershed No.	6-C	Chapter 93 Class.	WWF
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	Suez Water PA		
PWS Waters	Susquehanna River	Flow at Intake (cfs)	
PWS RMI		Distance from Outfall (mi)	15

Changes Since Last Permit Issuance: None

1.4.1 Water Supply Intake

The nearest downstream water supply intake is approximately 15 miles downstream by Suez Water PA on Susquehanna River, in Susquehanna Township, Dauphin County. No impact is expected from this discharge on the intake.

Treatment Facility Summary				
Treatment Facility Name: Halifax Village				
WQM Permit No.	**Issuance Date**			
2291409	April 28, 1992			
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Secondary	Extended Aeration	Hypochlorite	0.031
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.031		Not Overloaded	Aerobic Digestion	

Changes Since Last Permit Issuance: Permit modification was made to add de-chlorination system

2.1 Treatment Facility

The treatment plant consists aerated EQ tank with 2 grinder pumps, flow meter to measure flow coming out of the EQ tank, pre-aeration tank with 3 access points, the 2nd tank has 3 sections, ¾ of the tank is used for aeration tank, and ¼ is used as clarifier, a chlorine contact tank with tablet chlorinator and basket for adding more tablets if needed, flow meter pit and de-chlorination system and a sludge holding tank.

The permitted facilities include:

- Screening unit
- A 10,470-gallon pre-aeration flow equalization tank
- A 31,239-gallon aeration tank provided with a diffused aeration system
- A 10,772-gallon clarifier
- A tablet type chlorinator and a 628-gallon contact tank
- De-chlorination feeder
- Equalization tank with pumps
- Aerobic sludge digester
- 400 feet of 10-inch outfall sewer discharging to an unnamed tributary of the Susquehanna River.

2.2 Chemicals

- Soda ash for pH adjustments
- Calcium Hypochlorite for disinfection
- Sodium bisulfate for de-chlorination
- Polymer added to sludge tank as needed

3.0 Compliance History

3.1 DMR Data for Outfall 001 (from October 1, 2018 to September 30, 2019)

Parameter	SEP-19	AUG-19	JUL-19	JUN-19	MAY-19	APR-19	MAR-19	FEB-19	JAN-19	DEC-18	NOV-18	OCT-18
Flow (MGD) Average Monthly	0.00732	0.00707	0.00780	0.00802	0.013	0.009	0.009	0.010	0.012	0.012	0.021	0.010
Flow (MGD) Daily Maximum	0.01308	0.01038	0.05724	0.022	0.042	0.019	0.027	0.021	0.036	0.036	0.052	0.023
pH (S.U.) Minimum	6.08	6.35	5.85	6.15	5.96	6.7	6.8	6.8	6.9	6.8	6.5	6.5
pH (S.U.) Maximum	8.16	8.04	8.39	8.02	7.49	7.8	7.6	7.5	7.6	7.5	7.7	7.2
DO (mg/L) Minimum	6.09	6.02	6.45	3.41	5.54	6.4	5.0	5.0	5.7	6.4	5.0	5.1
TRC (mg/L) Average Monthly	< 0.02	< 0.02	< 0.03	< 0.03	< 0.03	0.06	0.05	0.05	0.06	0.05	0.05	0.04
TRC (mg/L) Instantaneous Maximum	0.05	0.08	0.07	0.16	0.09	0.09	0.08	0.09	0.08	0.08	0.08	0.07
CBOD5 (mg/L) Average Monthly	< 3.0	< 3.0	< 3.0	< 7	8.0	4.2	7.9	9.6	9.6	3.0	4	< 3
TSS (mg/L) Average Monthly	7.0	12.0	< 15.0	< 11.0	19	25.8	17.9	11.9	30	32.7	21	27
Fecal Coliform (CFU/100 ml) Geometric Mean	< 4.0	117.0	< 11.0	57	< 217	< 2	2.83	< 2	47.3	12.6	26.7	< 10
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	8.0	344.8	56.0	330	392	< 2	4	< 2	160	16	71.2	< 10
Total Nitrogen (mg/L) Annual Average										0.0441		
Ammonia (mg/L) Average Monthly	< 0.3	< 0.2	0.47	< 0.3	3.7	2.0	2.06	2.03	1.64	6.78	1.29	3.04
Total Phosphorus (mg/L)Annual Average										8.39		

3.2 Effluent Violations for Outfall 001, from: November 1, 2018 To: September 30, 2019

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
pH	07/31/19	Min	5.85	S.U.	6.0	S.U.
pH	05/31/19	Min	5.96	S.U.	6.0	S.U.
DO	06/30/19	Min	3.41	mg/L	5.0	mg/L
TSS	12/31/18	Avg Mo	32.7	mg/L	30	mg/L
Fecal Coliform	05/31/19	Geo Mean	< 217	CFU/100 ml	200	CFU/100 ml
Ammonia	05/31/19	Avg Mo	3.7	mg/L	2.5	mg/L

3.3 Compliance History	
Summary of DMRs:	Discharge Monitoring Reports (DMRs) review for the facility for the last 12 months of operation presented on the table above in section 3.1 indicate permit limits have been most of the time. Six permit limit violations were noted on DMRs during the period reviewed as shown on the table above in section 3.2. These violations appear to have been addressed. No violations noted on DMR after July 2019
Summary of Inspections:	The facility was inspected 8 times during the past permit cycle. Inspection reports review for the facility during the period indicate permit limits have been met satisfactorily. The facility has gone through 3 operators during the last permit cycle. A Fecal Coliform permit violation and rag accumulation at the outfall were documented during the May 14, 2019 inspection. Operation and maintenance improvement measures implemented by the current operators have addressed most of the permit violations documented in the past. It was recommended to add bar screen prior to EQ tank to prevent excessive rags entering the treatment system and getting carried over to the outfall. The operator was advised to clean-up the rag debris at the outfall and implement measures to prevent rag accumulation at the outfall in the future.

Development of Effluent Limitations

Outfall No.	001	**Design Flow (MGD)**	.062
Latitude	40º 30' 27.00"	**Longitude**	-76º 57' 12.00"

Wastewater Description: Sewage Effluent

4.1 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.

4.1.1 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

4.2 Water Quality-Based Limitations

4.2.1 Streamflows

Streamflows for the water quality analysis were determined by correlating with the yield of USGS gauging station No. 01570500 on Susquehanna River in Harrisburg. The Q_{7-10} and drainage area at the gage is 2610 ft3/s and 24100mi^2 respectively. The resulting yields are as follows:

- Q_{7-10} = (2610 ft^3/s)/ 24100 mi^2 = 0.11 $ft^3/s/ mi^2$
- Q_{30-10} / Q_{7-10} = 1.17
- Q_{1-10} / Q_{7-10} = 0.95

The drainage area at discharge taken from the previous factsheet = 0.3 mi^2

The Q_{7-10} at discharge = 0.3 mi^2 x 0.10 $ft^3/s/mi^2$ = 0.033 ft^3/s.

4.2.3 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 attached computer model of the stream:

* Discharge pH = 6.10 (July -Sept DMR median)
* Discharge Temperature = 25 ^{o} C (Default)
* Stream pH = 8.2 (Taken from WQN station at Harrisburg)
* Stream Temperature = 23.5^{o}C (Taken from WQN station at Harrisburg)
* Background NH_3-N = 0.0 (default)

4.2.4 $CBOD_5$

The attached WQM 7.0 stream model results presented in attachment B indicates that, for a discharge of 0.062 MGD from Halifax Village STP, a limit of 25 mg/l $CBOD_5$,is adequate to protect the water quality of the stream. This limit is consistent with the existing permit and the STP has been achieving this limitation. Therefore, a limit of 25 mg/l AML, and 50 mg/l IMAX are recommended again for this permit cycle.

4.2.5 NH_3-N

The attached WQM 7.0 stream model results (attachment B) also indicates that, a summer limit of 3.0 mg/l NH_3 as a monthly average is adequate to protect the aquatic life from toxicity effects. This is less stringent than the existing limit of 2.5 mg/l which will remain in the permit due to anti-backsliding. The limit for winter months is 3 times the summer limit (7.5mg/l NH_3-N).

4.2.6 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, this limit will be continued in the renewed permit with a daily monitoring requirement per DEP guidance.

4.2.7 Total Suspended Solids(TSS)

There are no water quality criteria for TSS. An average monthly limit of 30 mg/l in the existing permit based on the minimum level of effluent quality attainable by secondary treatment as defined in 40 CFR Chapter 1, Part 133, Section 133.102b(1) and 25 PA § 92a.47(a)(1) will continue.

4.2.8 Toxics

No parameter of concern is associated with this discharge.

4.2.9 Chesapeake Bay Strategy:

The Department formulated a strategy in April 2007, to comply with the EPA and Chesapeake Bay Foundation requirements to reduce point source loadings of Total Nitrogen (TN) and Total Phosphorus (TP) to the Bay. In the Strategy, sewage dischargers have been prioritized by Central Office 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. 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 at a monitoring frequency following Table 6-3 of DEP's Technical Guidance for Development and Specification of effluent Limitations (No. 362-0400-001). Any facility in Phases 4 and 5 that undergoes expansion is subjected to cap load right away.

EPA published the Chesapeake Bay Total Maximum Daily Load (TMDL) in December of 2010. Despite extensive restoration efforts during the past 25 years, the TMDL was prompted by insufficient progress and continued poor water quality in the Chesapeake Bay and its tidal tributaries.

In order to address the TMDL, Pennsylvania developed in addition to the Bay Strategy, a Chesapeake Watershed Implementation Plan (WIP) Phase 1 in January 2011 and Phase 2 in March 2012. In accordance with the Phase 2 WIP and its supplement, re-issuing permits for significant dischargers follow the same phased approach formulated in the original Bay strategy, whilst Phase 4 and Phase 5 will be required to monitor and report TN and TP during permit renewal. This facility is, classified as a phase 5, and has been monitoring Total Nitrogen and Total Phosphorus annually since the previous permit cycle and will be required to continue monitoring Nitrate-Nitrite as N, Total Kjeldahl Nitrogen, Total Nitrogen and Total Phosphorus semi-annually during this permit cycle collect adequate data.

4.2.10 Total Residual Chlorine

The attached TRC results presented in attachment C utilizes the equations and calculations presented in the Department's 2003 Implementation Guidance for Residual Chlorine (TRC) (ID # 391-2000-015) for developing chlorine limitations. The result indicates that a water quality limit rounded to 2 decimal places of 0.06 mg/l monthly average and 0.20 mg/l IMAX for the discharge would be needed to prevent toxicity concerns. This is consistent with the existing limit, IMAX is slightly more stringent but DMR and inspection data show facility has capability to comply with the limitation.

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 will contain the following special conditions:

Stormwater Prohibition, Approval Contingencies, Proper Waste/solids Management, and Chlorine minimization.

5.4 Biosolids Management

Digested sludge is hauled out periodically by a license hauler.

5.5 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.

5.6 Class A Wild Trout Fisheries

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

5.7 303d Listed Streams:

The discharge is located on a 303d listed stream segment as impaired for recreational use due to pathogen. No action is warranted at this time.

5.8 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).

5.9 Effluent Monitoring

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	0.06	XXX	0.20	1/day	Grab
CBOD5	XXX	XXX	XXX	25	XXX	50	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	2,000 Geo Mean	XXX	10,000	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	2/month	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 Nov 1 - Apr 30	XXX	XXX	XXX	7.5	XXX	15	2/month	8-Hr Composite
Ammonia May 1 - Oct 31	XXX	XXX	XXX	2.5	XXX	5	2/month	8-Hr Composite
TKN	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/6 months	8-Hr Composite

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

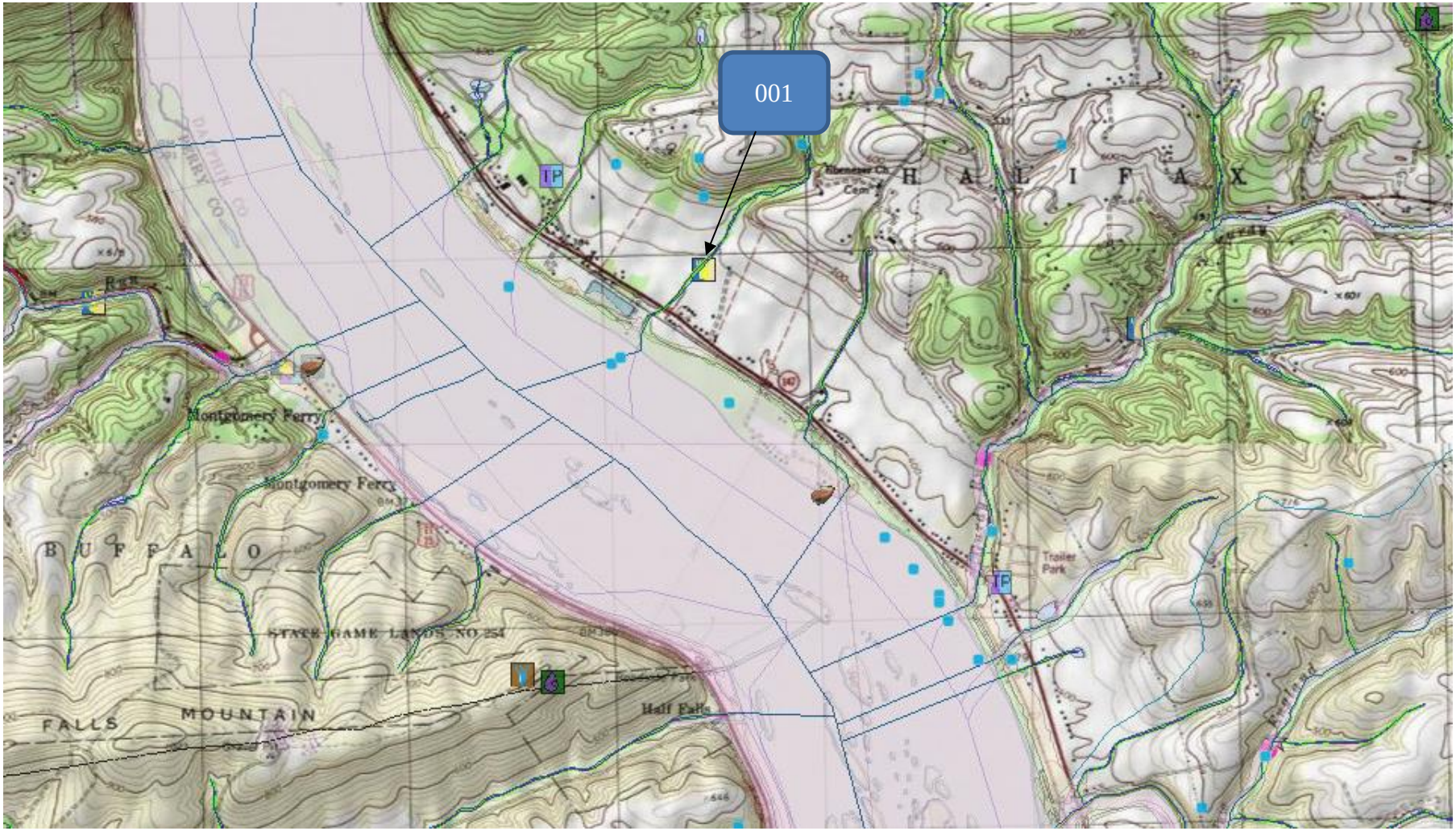
Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Maximum	Instant. Maximum		
Total Phosphorus	XXX	XXX	XXX	XXX	Report Daily Max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

Compliance Sampling Location: Outfall 001

7.0 Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment **B**)
☐	PENTOXSD for Windows Model (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.
☐	Other: Quittapahilla Creek TMDL
☐	Other:

Attachments

A. Topographical Map



B. WQM Model Results

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
06C	16877	Trib 16877 to Susquehanna River

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)
0.290	Halifax Village	PA0084492	0.062	CBOD5	25		
				NH3-N	3.02	6.04	
				Dissolved Oxygen			5

Permit No. PA0084492

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
06C	16877	Trib 16877 to Susquehanna River	**0.290**	440.00	0.30	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	0.00	0.000	0.000	0.0	0.00	0.00	23.00	7.10	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
Halifax Village	PA0084492	0.0620	0.0620	0.0620	0.000	25.00	6.10

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. PA0084492

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
06C	16877	Trib 16877 to Susquehanna River	**0.010**	384.00	0.32	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	23.00	7.10	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. PA0084492

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
06C	16877	Trib 16877 to Susquehanna River

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												
0.290	0.03	0.00	0.03	.0959	0.03788	.383	3.24	8.45	0.10	0.169	24.52	6.20
Q1-10 Flow												
0.290	0.03	0.00	0.03	.0959	0.03788	NA	NA	NA	0.10	0.170	24.54	6.20
Q30-10 Flow												
0.290	0.04	0.00	0.04	.0959	0.03788	NA	NA	NA	0.10	0.165	24.46	6.22

Permit No. PA0084492

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	0.95	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.17	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	5		

Permit No. PA0084492

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
06C	16877	Trib 16877 to Susquehanna River

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
0.290	Halifax Village	9.03	11.71	9.03	11.71	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
0.290	Halifax Village	2.21	3.02	2.21	3.02	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)		
0.29	Halifax Village	25	25	3.02	3.02	5	5	0	0

Permit No. PA0084492

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
06C	16877	Trib 16877 to Susquehanna River

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
0.290	0.062	24.523	6.205
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
3.237	0.383	8.446	0.102
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
19.52	1.457	2.30	0.991
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
5.773	30.758	Owens	5
Reach Travel Time (days)			
0.169			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.017	18.94	2.26	6.04
0.034	18.37	2.22	6.22
0.051	17.83	2.19	6.35
0.067	17.30	2.15	6.45
0.084	16.78	2.12	6.53
0.101	16.28	2.08	6.59
0.118	15.80	2.05	6.65
0.135	15.33	2.01	6.71
0.152	14.87	1.98	6.76
0.169	14.43	1.95	6.81

Permit No. PA0084492

C. TRC Calculations

Copy of TRC_CALC1

TRC EVALUATION			
Input appropriate values in A3:A9 and D3:D9			
0.033	= Q stream (cfs)	0.5	= CV Daily
0.062	= 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 = 0.129	1.3.2.iii	WLA cfc = 0.118
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 0.048	5.1d	LTA_cfc = 0.069

Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AML MULT = 1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.059	AFC
		INST MAX LIMIT (mg/l) = 0.193	

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)

Page 1