pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0246654**
Facility Type	**Municipal**	APS ID	**365044**
Major / Minor	**Minor**	Authorization ID	**1247766**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Centre Township Municipal Authority**	Facility Name	**Hillcrest Estates STP**
Applicant Address	449 Bucks Hill Road	Facility Address	739b Boar Road
	Mohrsville, PA 19541-9340		Mohrsville, PA 19541
Applicant Contact	David Phillips	Facility Contact	David Phillips
Applicant Phone	(610) 926-8833	Facility Phone	(610) 926-8833
Client ID	93104	Site ID	547955
Ch 94 Load Status	Not Overloaded	Municipality	Centre Township
Connection Status	No Exceptions Allowed	County	Berks
Date Application Received	September 27, 2018	EPA Waived?	Yes
Date Application Accepted	October 16, 2018	If No, Reason	

Purpose of Application: NPDES permit renewal for discharge of treated sewage

Summary of Review

1.0 General Discussion

This fact sheet supports the re-issuance of an existing NPDES permit for discharge of treated domestic wastewater from Centre Township Municipal Authority(Authority)-Hillcrest wastewater treatment plant. The Authority owns, operates, and maintains the wastewater treatment plant. The facility is located in Centre Township, Berks County and serves Centre Township. The sewer collection system is not combined and there is no bypasses or overflows approved in the collection system. There is no pump station within the collection system, sewage flow to the treatment plant by gravity. The treatment plant is an extended aeration facility with a hydraulic design capacity of 0.025 MGD and an organic design capacity of 50.04 lbs/day- BOD_5 The discharge goes to unnamed tributary(UNT) to UNT to Irish Creek, which is classified for Warm Water Fishery(WWF). The existing NPDES permit was issued on March 6, 2014 with an effective date of April 1, 2014 and expiration date of March 31, 2019. The applicant submitted a timely NPDES renewal application to the Department and is currently operating under the terms and conditions in the existing permit under administrative extension provisions pending DEP 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 wasted to a holding tank and hauled off site periodically to Exeter Township wastewater treatment plant for further processing and disposal.

Approve	Deny	Signatures	Date
X		*J. Pascal Kwedza* J. Pascal Kwedza, P.E. / Environmental Engineer	February 21, 2021
x		*Maria D. Bebenek for Daniel W. Martin* Daniel W. Martin, P.E. / Environmental Engineer Manager	February 26, 2021
x		*Maria D. Bebenek* Maria D. Bebenek, P.E. / Program Manager	February 26, 2021

Summary of Review

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 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

- Effluent sample type has been changed from 8-Hr composite to 24-Hr composite for consistency with influent sample type in the permit. Inspection report indicated the facility has capability and is currently set up for 24-Hr sample collection.
- Total Nitrogen and Total Phosphorus sample type has been changed from grab to 24-Hr composite as well.
- Instantaneous maximum was recalculated for Ammonia.

1.3.1 Existing Permit Limits and Monitoring Requirements

DISCHARGE LIMITATIONS								MONITORING REQUIREMENTS	
	Mass Units lbs/day			Concentrations mg/l					
Discharge Parameter	Average Monthly	Average Weekly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily	Inst. Maximum	Monitoring Frequency	Sample Type
Flow (mgd)	Monitor & Report	XXX	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	0.16	XXX	XXX	0.52	1/day	Grab
TSS	6.26	XXX	XXX	30	XXX	XXX	60	2/month	8-hour comp
$CBOD_5$	5.21	XXX	XXX	25	XXX	XXX	50	2/month	8-hour comp
Ammonia Nov 1 - Apr 30	1.8	XXX	XXX	9	XXX	XXX	19	2/month	8-hour comp
Ammonia May 1 - Oct 31	0.63	XXX	XXX	3.0	XXX	XXX	6.5	2/month	8-hour comp
Fecal Col. (5/1 to 9/30)	XXX	XXX	XXX	200	XXX	XXX	1,000	2/month	Grab
Fecal Col. (10/1 to 4/30)	XXX	XXX	XXX	2000	XXX	XXX	10,000	2/month	Grab
Total Phosphorus	XXX	XXX	XXX	Report	XXX	XXX	XXX	1/year	Grab
Total Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	XXX	1/year	Grab

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	001	Design Flow (MGD)	0.025
Latitude	40° 26’ 26.00”	Longitude	76° 0’ 33.00”
Quad Name	Bernville	Quad Code	1537
Wastewater Description:	Sewage		
Receiving Waters	Unnamed Tributary of Irish Creek	Stream Code	02157
NHD Com ID	25962112	RMI	0.5
Drainage Area	0.19 sq.mi.	Yield (cfs/mi^2)	0.23
Q_{7-10} Flow (cfs)	0.044	Q_{7-10} Basis	USGS gage Station
Elevation (ft)	365	Slope (ft/ft)	
Watershed No.	3-B	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired for Aquatic Life		
Cause(s) of Impairment	Siltation		
Source(s) of Impairment	Erosion		
TMDL Status	Tentative	Name	Irish Creek TMDL (for Sedimentation)
Background/Ambient Data *		Data Source	
pH (SU)			
Temperature (°F)			
Hardness (mg/L)			
Other:			
Nearest Downstream Public Water Supply Intake		Borough of Pottstown Water and Sewer Authority	
PWS Waters	Schuylkill River	Flow at Intake (cfs)	
PWS RMI		Distance from Outfall (mi)	>35 miles

Changes Since Last Permit Issuance:

1.4.1 Water Supply Intake

The nearest downstream water supply intake is approximately 35 miles downstream by Borough of Pottstown Water and Sewer Authority on Schuylkill River in West Pottsgrove Township, Chester County. No impact is expected from this discharge.

Treatment Facility Summary				
Treatment Facility Name: Centre Township Ma-Hillcrest Estates STP				
WQM Permit No.	**Issuance Date**			
0602405	8/2002			
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Secondary	Extended Aeration	Chlorine With De-chlorination	0.025
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.025	50	Existing Organic Overload	Aerobic Digestion	Landfill

Changes Since Last Permit Issuance:

2.1 Facility description

The treatment system consists of a manual bar screen, an aerated equalization (EQ) tank with 2 submersible pumps, 1 anoxic tank and 2 aeration tank and 2 clarification tanks, 1 chlorine contact tank with de-chlorination, post-aeration chamber, and a sludge holding tank. Ultrasonic flow meter is used for measuring effluent.

2.2 Chemicals

- Lime is used for pH adjustment
- Calcium hypochlorite $(CaOCl)_2$ is used for disinfection.
- Sodium bisulfite for de-chlorination

3.0 Compliance History

3.1 DMR Data for Outfall 001 (from January 1, 2020 to December 31, 2020)

Parameter	DEC-20	NOV-20	OCT-20	SEP-20	AUG-20	JUL-20	JUN-20	MAY-20	APR-20	MAR-20	FEB-20	JAN-20
Flow (MGD) Average Monthly	0.0136	0.01216	0.00978	0.00778	0.01072	0.00753	0.00807	0.00921	0.01176	0.01081	0.00996	0.0113
Flow (MGD) Daily Maximum	0.04986	0.02821	0.01843	0.01397	0.06466	0.01374	0.01368	0.0161	0.02002	0.02785	0.01782	0.04607
pH (S.U.) Minimum	6.69	6.93	7.07	6.85	6.7	6.85	6.9	6.43	6.99	6.71	6.88	6.68
pH (S.U.) Maximum	7.89	7.85	7.73	7.74	7.52	7.83	7.96	8.18	7.82	7.63	7.71	7.8
DO (mg/L) Minimum	6.2	5.35	6.34	6.02	5.03	7.75	5.36	7.06	5.46	6.3	6.42	7.36
TRC (mg/L) Average Monthly	0.04	< 0.03	0.03	0.04	0.07	< 0.03	0.04	< 0.03	0.06	< 0.03	< 0.05	< 0.05
TRC (mg/L) Instant. Maximum	0.07	0.06	0.19	0.18	0.33	0.07	0.17	0.07	0.33	0.07	0.34	0.13
CBOD5 (lbs/day) Average Monthly	0.20	< 0.20	< 0.10	< 0.10	< 0.40	< 0.10	< 0.10	< 0.10	0.30	0.30	0.20	1.00
CBOD5 (mg/L) Average Monthly	2.7	< 3	< 2.7	< 2	< 4	< 2	< 2	< 2.1	3.1	4	3.5	6.9
BOD5 (lbs/day) Raw Sewage Influent Ave. Monthly	9	10	7	6	10	20	8	9	18	11	9	50
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	10	13	7	8	16	31	8	12	19	13	10	95
BOD5 (mg/L) Raw Sewage Influent Ave. Monthly	105	107	123	92.1	146.8	436	125	159	220	150	155	193
TSS (lbs/day) Average Monthly	< 0.40	< 0.40	< 0.20	< 0.30	< 0.60	< 0.20	< 0.30	< 0.20	< 0.30	< 0.30	< 0.30	< 0.80
TSS (lbs/day) Raw Sewage Influent Ave. Monthly	4	8	2	2	9	21	5	3	8	4	48	20
TSS (lbs/day) Raw Sewage Influent Daily Maximum	5	9	2	2	17	39	7	4	10	5	92	37
TSS (mg/L) Average Monthly	< 4.6	< 4	< 4	< 4	< 5.2	< 4	< 4	< 4	< 4.2	< 4.4	< 5	< 4.4

TSS (mg/L) Raw Sewage Influent Ave. Monthly	50	83.8	40	28	135	496.3	71	51	96	58	742	101
Fecal Coliform (CFU/100 ml) Geometric Mean	< 1	< 1	< 2	< 3	< 1	< 1	< 2	< 15	12	< 1	< 3	134
Fecal Coliform (CFU/100 ml) Instant. Maximum	1	< 1	3	9	< 1	< 1	3	222	21	2	11	160
Ammonia (lbs/day) Average Monthly	< 0.008	< 0.01	< 0.005	< 0.007	< 0.10	< 0.008	< 0.007	< 0.20	0.05	< 0.009	< 0.006	< 0.02
Ammonia (mg/L) Average Monthly	< 0.1	< 0.1	< 0.1	< 0.1	< 0.8	< 0.15	< 0.1	< 2.84	0.68	< 0.13	< 0.1	< 0.11

DMR summary for the past 12-month of operation is attached in section 3.1. No DMR violation noted for the past 12 months of operation. The facility had a history of TRC and Fecal Coliform violations in past but appear to have addressed those violation. Currently, the facility has a compliance record is good.

3.2 Summary of Inspections:

The facility has been inspected several times during the previous permit cycle. No effluent violation noted during plant inspections. Sludge accumulation at outfall 001 up to 50 meters downstream was observed during plant inspection on 10/07/ 2014.

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** .025
Latitude 40º 26' 26.00" **Longitude** -76º 0' 33.00"
Wastewater Description: Sewage Effluent

4.1 Basis for Effluent Limitations

In general, the CWA 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 average limits for Total Suspended Solids and $CBOD_5$ are not applicable to this discharge because sampling frequency is less than weekly.

4.2 Mass-Based Limits

The federal regulation at 40 CFR 122.45(f) requires that effluent limits be expressed in terms of mass, if possible. The regulation at 40 CFR 122.45(b) requires that effluent limitations for POTWs be calculated based on the design flow of the facility. The mass-based limits are expressed in pounds per day and are calculated as follows:

Mass based limit (lb/day) = concentration limit (mg/L) × design flow (mgd) × 8.34

4.3 Water Quality-Based Limitations

4.3.1 Receiving Stream

The receiving waterbody is UNT to Irish Creek. According to 25 PA § 93.9f, the UNT is protected for warm water fishes (WWF) It is located in Drainage List F and State Watershed 3-B. The UNT is assigned a stream code 02157. The secondary receiving UNT has a stream code of 02154. According to the Department's Integrated Water Quality Monitoring and Assessment Report, The UNT is impaired for Aquatic life caused by siltation from Agriculture and erosion. Irish Creek Total Maximum Daily Load **(**TMDL) for sediment was completed and public participation completed in 2012, but the final TMDL approval is tentative. See TMDL Requirement section of the report for further discussion on TMDL and wasteload allocation for this facility.

4.3.2 Stream flows

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 to 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 with the yield of USGS gage No. 01470500 on Schuylkill River near Berne. The $Q_{7\text{-}10}$ and drainage area at the gage is 82. 3 ft^3/s) and 355mi^2 respectively. The resulting yields are as follows:

- $Q_{7\text{-}10}$ = (82.3ft^3/s)/355 mi^2 = 0.23$ft^3/s/ mi^2$
- $Q_{30\text{-}10}$ / $Q_{7\text{-}10}$ = 1.23
- $Q_{1\text{-}10}$ / $Q_{7\text{-}10}$ = 0.84

The drainage area at the point of discharge calculated using streamStats = 0.19 mi^2.

The $Q_{7\text{-}10}$ at discharge = 0.19 mi^2 x 0.23 $ft^3/s/mi^2$ = 0.044 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 attached model of the stream:

- Discharge pH = 7.74 (DMR median)
- 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 $CBOD_5$ & NH_3-N

There are no point source discharges closed to this discharge that will interact with it significantly, therefore only this discharge was modelled using WQM 7.0 stream model. The WQM 7.0 stream model results presented in attachment B indicate a limit of 25 mg/l for $CBOD_5$ is adequate to protect the water quality of the stream. This limit is consistent with the existing permit and the facility has been consistently achieving below this limitation. Therefore, a limit of 25mg/l average monthly limit(AML) and 50 mg/l IMAX is recommended for this permit cycle. Mass limit calculation follows the equation presented in section 4.2.

The attached WQM 7.0 stream model result also indicate a summer limit of 3.5 mg/l for NH_3-N is necessary to protect aquatic life from toxicity effects. The recommended limit is slightly less stringent than the existing limit and will not be written in the permit due to anti-backsliding restrictions. The existing summer limit of 3.0 mg/l NH_3-N as AML and the existing IMAX of 6.5 mg/l was corrected to 6mg/l will remain in the permit in addition to the existing winter limit of 9 mg/l as AML and the existing IMAX of 19 mg/l was corrected to 18 mg/l for consistency with IMAX calculation. The facility discharge is well below these limits. Mass limit calculation follows the equation presented in section 4.2.

4.3.5 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.

4.3.6 Total Residual Chlorine

The results presented in attachment C utilizes the equations and calculations 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 calculation was done with acute PMF of 1 taken from running DEP's Toxic Management Spreadsheet. The attached result indicates that a water quality-based limit of 0.357 mg/l as AML and 1.17 mg/l as IMAX would be needed to prevent toxicity concerns. The recommended limits are less stringent than the existing limits and will not be written in the permit due to ant-backsliding restrictions. The existing limit of 0.16 mg/l as AML and 0.52 mg/l IMAX will remain in the permit. The facility is complying with the limitation.

4.3.7 Toxics

There are no parameters of concern associated with this discharge. Therefore, no reasonable potential analysis was conducted for toxic parameters.

4.3.8 Fecal Coliform

The existing technology Fecal Coliform limit as a geometric mean respectively are adequate and will remain in the permit.

4.3.9 Delaware River Basin Commission (DRBC) Requirements

DRBC regulations and policies are applicable to NPDES permits for all facilities within the Delaware River basin. A copy of the draft permit will be forwarded to the DRBC because the facility is designed to discharge a flow of 0.050 MGD to UNT to UNT to Irish Creek within the jurisdiction of the DRBC. However, since the actual average flow is less than 0.05MGD and the discharge is not located in "Special Protection Waters" the Department will proceed to renew this NPDES permit without waiting for any review by the DRBC. Sewage dischargers that are not in DRBC's "Special Protection Waters" and do not discharge more than 0.05MGD do not trigger DRBC project reviews and do not qualify as docket items for future DRBC hearings.

4.3.10 Influent BOD and TSS Monitoring

The existing permit has influent CBOD5 and TSS monitoring at the same frequency as is done for effluent in order to implement Chapter 94.12 and assess percent removal requirements. The influent CBOD5 and TSS monitoring requirement will remain in the permit.

4.3.11 Industrial Users

The application indicated the wastewater treatment plant receives no industrial or commercial wastewater.

4.3.12 Pretreatment Requirements

The design annual average flow of the treatment plant is 0.025 MGD and the facility receives no industrial or commercial wastewater and does not require compliance with pretreatment standards. However, the permit contains standard conditions requiring the permittee to monitor and control industrial users if applicable.

4.3.13 Nutrient Monitoring

The existing annual monitoring of Total Phosphorus and Total Nitrogen following DEP's SOP will remain in the current permit to continue to collect nutrient data for discharges to waterbodies. This discharge is located outside of the Chesapeake Bay watershed; therefore, no Chesapeake Bay TMDL requirement was considered.

4.3.14 Stormwater Monitoring

No stormwater outfall is associated with this facility

4.3.15 Total Suspended Solids(TSS):

There is no water quality criterion for TSS. The existing limits of 30 mg/L based on the minimum level of effluent quality attainable by secondary treatment. will remain in the permit. The facility is meeting the limitation. Mass limit calculation follows the equation presented in section 4.2.

4.3.16 TMDL

The completed Irish Creek TMDL allocated a waste load of 6.26 lb/day TSS for this facility. It appears the wasteload was based on the design capacity of 0.025 MGD and a concentration of 30mg/l. The facility has been complying with the proposed wasteload allocation.

5.0 Other Requirements

5.1 The permit contains the following special conditions:

1. Stormwater Prohibition. 2. Approval Contingencies, 3. Proper Waste/solids Management, 4. Restriction on receipt of hauled in waste under certain conditions. 5. Chlorine Minimization

5.2 Flow Monitoring

Monitoring of effluent flow volume required in the existing permit will be continued per 40 CFR § 122.44(i)(1)(ii).

5.3 Anti-backsliding

Not applicable to this permit

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 stream segment that is designated on the 303(d) list as impaired for aquatic life, and the impairment is due to siltation from Agriculture and erosion. Irish Creek TMDL for sediment was completed and public participation completed in 2012, but it appears the final TMDL was not approved by EPA. However, the wasteload allocated to this discharge in the TMDL is in the permit and the facility is in compliance with it. Nothing further 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

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”

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.

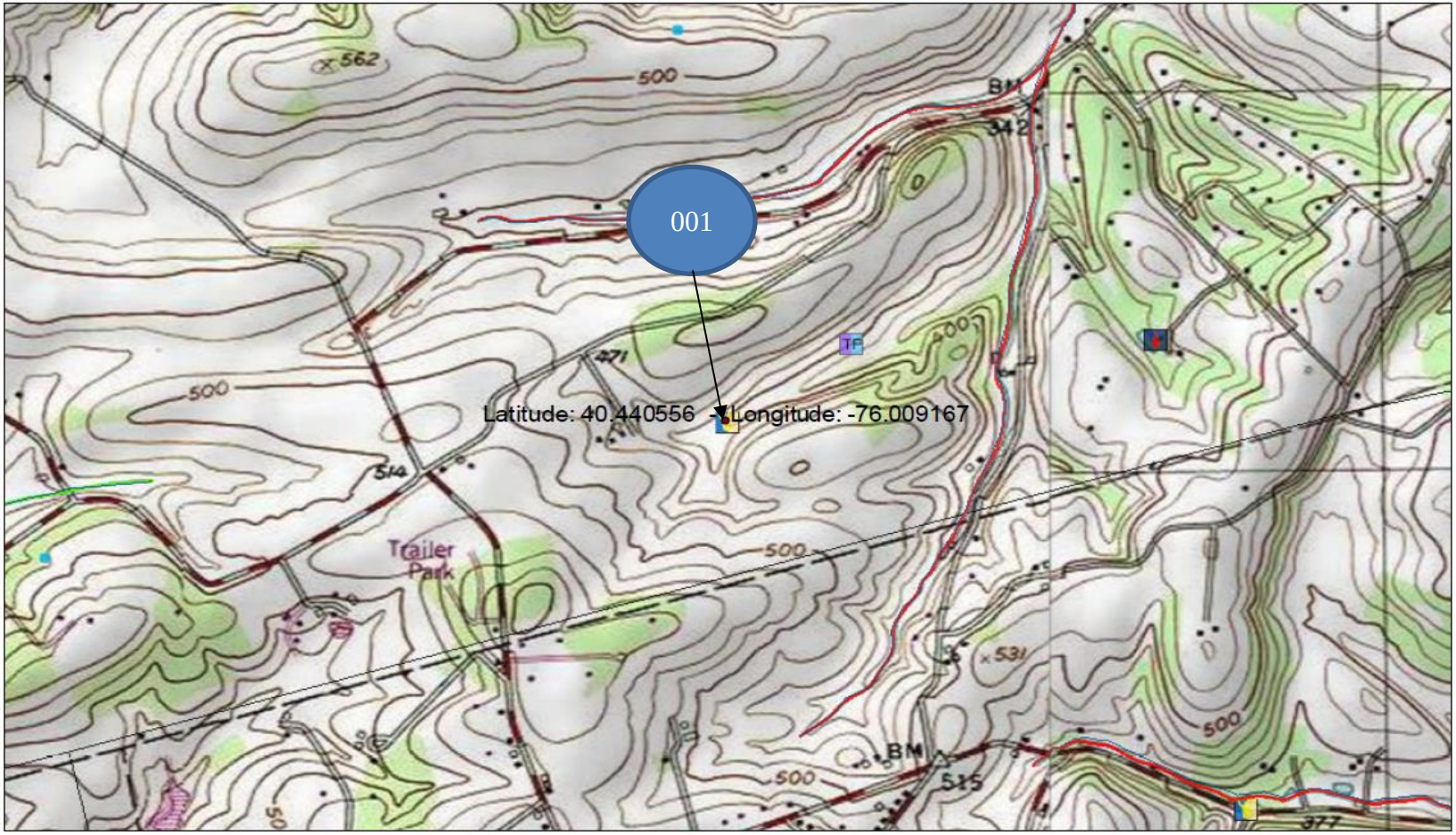
Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	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	0.16	XXX	0.52	1/day	Grab
CBOD5	5.21	XXX	XXX	25.0	XXX	50	2/month	24-Hr Composite
BOD5 Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	2/month	24-Hr Composite
TSS	6.26	XXX	XXX	30.0	XXX	60	2/month	24-Hr Composite
TSS Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	2/month	24-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
Total Nitrogen	Report Annl Avg	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	24-Hr Composite
Ammonia Nov 1 - Apr 30	1.88	XXX	XXX	9.0	XXX	18	2/month	24-Hr Composite
Ammonia May 1 - Oct 31	0.63	XXX	XXX	3.0	XXX	6	2/month	24-Hr Composite
Total Phosphorus	Report Annl Avg	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	24-Hr Composite

Compliance Sampling Location: At outfall 001

7.0 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 Limitations in Individual NPDES Permits for Sewage Dischargers.
☐	Other:

8. Attachments

A. Topographical Map



B. WQM Model Results

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
03B	2157	Trib 02157 of Irish 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)
0.500	Hillcrest STP	PA0246654	0.025	CBOD5	25		
				NH3-N	3.54	7.08	
				Dissolved Oxygen			5

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WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
03B	2157	Trib 02157 of Irish 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
0.500	Hillcrest STP	6.61	12.89	6.61	12.89	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
0.500	Hillcrest STP	1.48	3.54	1.48	3.54	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)		
0.50	Hillcrest STP	25	25	3.54	3.54	5	5	0	0

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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
03B	2157	Trib 02157 of Irish Creek	**0.010**	335.00	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	0.230	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

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WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
03B	2157	Trib 02157 of Irish Creek

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
0.500	0.025	22.347	7.210
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
2.880	0.357	8.074	0.080
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
12.80	1.333	1.66	0.839
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.720	28.503	Owens	5
Reach Travel Time (days)			
0.373			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.037	12.11	1.61	7.29
0.075	11.46	1.56	7.52
0.112	10.84	1.51	7.64
0.149	10.25	1.47	7.71
0.187	9.70	1.42	7.77
0.224	9.18	1.38	7.83
0.261	8.68	1.34	7.87
0.299	8.21	1.29	7.90
0.336	7.77	1.25	7.90
0.373	7.35	1.22	7.90

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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	0.84	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		

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WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
03B	2157	Trib 02157 of Irish 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												
0.500	0.04	0.00	0.04	.0387	0.01160	.357	2.88	8.07	0.08	0.373	22.35	7.21
Q1-10 Flow												
0.500	0.04	0.00	0.04	.0387	0.01160	NA	NA	NA	0.08	0.392	22.57	7.24
Q30-10 Flow												
0.500	0.05	0.00	0.05	.0387	0.01160	NA	NA	NA	0.09	0.350	22.09	7.18

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C. TRC Calculations

TRC EVALUATION			
Input appropriate values in A3:A9 and D3:D9			
0.04	= Q stream (cfs)	0.5	= CV Daily
0.025	= 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 = 0.349	1.3.2.iii	WLA cfc = 0.333
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 0.130	5.1d	LTA_cfc = 0.193

Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AML MULT = 1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.160	AFC
		INST MAX LIMIT (mg/l) = 0.523	

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)**

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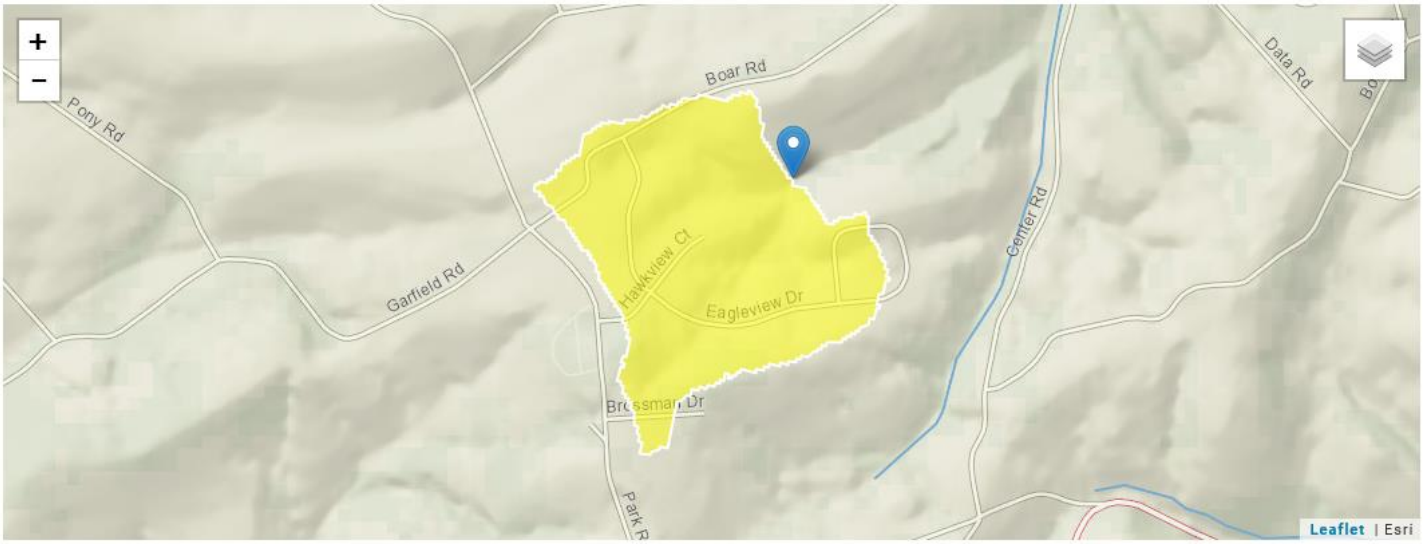
D. Streamstats Results

Hillcrest STP

Region ID:	PA
Workspace ID:	PA20210221150415832000
Clicked Point (Latitude, Longitude):	40.44064, -76.00925
Time:	2021-02-21 10:04:33 -0500



Drainage area and LFY data

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.19	square miles
PRECIP	Mean Annual Precipitation	45	inches
STRDEN	Stream Density -- total length of streams divided by drainage area	0	miles per square mile
ROCKDEP	Depth to rock	3	feet
CARBON	Percentage of area of carbonate rock	0.08	percent