pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0039748**
Facility Type	**Non-Municipal**	APS ID	**6127**
Major / Minor	**Minor**	Authorization ID	**1329998**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**US Army Corps Eng. - 7 Points Recreation Area**	Facility Name	**Lake Raystown 7 Points Recreation Area**
Applicant Address	6145 Seven Points Road	Facility Address	Seven Points Recreation Area
	Hesston, PA 16647-8303		Hesston, PA 16647-9227
Applicant Contact	Levi Johnson	Facility Contact	Dean Whitmore
Applicant Phone	(814) 658-7013	Facility Phone	(814) 658-6800
Client ID	92290	Site ID	453139
Ch 94 Load Status	Not Overloaded	Municipality	Penn Township
Connection Status		County	Huntingdon
Date Application Received	October 7, 2020	EPA Waived?	Yes
Date Application Accepted	October 15, 2020	If No, Reason	

Purpose of Application: NPDES permit Renewal.

Summary of Review

US Army Corps of Engineers has applied to the Pennsylvania Department of Environmental Protection (DEP) for reissuance of its NPDES permit. The permit was last reissued on February 11, 2016 and became effective on March 1, 2016. The permit expired on February 28, 2021 but the terms and conditions of the permit have been extended since that time.

The facility has a hydraulic design capacity of 0.15 MGD that discharges to Raystown Branch Juniata River. The plant serves 7 Points marina, restaurant, and campground. The facility is usually in operation from April through October.

Sludge use and disposal description and location(s): N/A

Changes from the previous permit: Unit of Fecal Coliform changed from CFU/100 ml to No./100 ml. The E. Coli monitoring & report requirements were added to the proposed permit. The TDS, Chloride, Bromide, and Sulfate monitoring and reporting requirements removed from the proposed permit.

Based on the review outline in this fact sheet, it is recommended that the permit be drafted and published in the Pennsylvania Bulletin for public comments for 30 days.

Approve	Deny	Signatures	Date
X		*Hilaryle* Hilary H. Le / Environmental Engineering Specialist	June 4, 2021 revised June 10, 2021
X		*Maria D. Bebenek for Daniel W. Martin* Daniel W. Martin, P.E. / Environmental Engineer Manager	June 14, 2021

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	001	Design Flow (MGD)	0.15
Latitude	40º 23' 14.33"	Longitude	-78º 4' 6.34"
Quad Name	Huntingdon	Quad Code	
Wastewater Description:	Sewage Effluent		
Receiving Waters	Raystown Branch Juniata River (WWF)	Stream Code	13349
NHD Com ID	65840053	RMI	15.0 miles
Drainage Area	939 mi.^{2}	Yield (cfs/mi^2)	Please see comments below
Q_{7-10} Flow (cfs)	Please see comments below	Q_{7-10} Basis	USGS StreamStats
Elevation (ft)		Slope (ft/ft)	
Watershed No.	11-D	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	
Nearest Downstream Public Water Supply Intake	Mifflintown Borough Municipal Authority, Juniata County		
PWS Waters	Juniata River	Flow at Intake (cfs)	
PWS RMI	37.4 miles	Distance from Outfall (mi)	Approximate 68 miles

Changes Since Last Permit Issuance: none

Drainage Area

The discharge is to Raystown Branch Juniata River at RMI 15.0 miles. A drainage area upstream of the discharge is estimated to be 939 mi.^{2}, according to USGS PA StreamStats available at https://streamstats.usgs.gov/ss/.

Streamflow

There are no nearby stream gages with low flow data that have extensive or recent periods of record. Since USGS PA StreamStats estimated the drainage area that is below the minimum value allowed by USGS's regression equations, the USGS StreamStats gage ID 0156200 on Raystown Branch near Saxton Township will be used to calculate the Q_{7-10} at the point of discharge using a low flow yield method. The Q_{7-10} here is 44.8 cfs and the drainage area is 754 mi.^{2} which results in a Q_{7-10} low flow yield of 0.06 cfs/mi.^{2}. This information is used to obtain a chronic or 30-day (Q_{30-10}), and an acute or 1-day (Q_{1-10}) exposure stream flow for the discharge point as follows (Guidance No. 391-2000-023):

$$\text{Low Flow Yield} = Q_{7-10gage} / \text{Drainage Area}_{gage} = 44.8 \text{ cfs} / 754 \text{ mi.}^2 = 0.06 \text{ cfs/mi.}^2$$
$$Q_{7-10discharge} = 0.038 \text{ cfs/mi.}^2 * \text{Drainage Area}_{discharge} = 0.06 \text{ cfs/mi.}^2 * 939 \text{ mi.}^2 = 56.34 \text{ cfs}$$
$$Q_{30-10} = 1.36 * Q_{7-10discharge} = 1.36 * 56.34 \text{ cfs} = 76.6 \text{ cfs}$$
$$Q_{1-10} = 0.64 * Q_{7-10discharge} = 0.64 * 56.34 \text{ cfs} = 36.1 \text{ cfs}$$

The resulting Q_{7-10} dilution ratio is: $Q_{stream} / Q_{discharge}$ = 56.34 cfs / [0.15 MGD * (1.55 cfs/MGD)] = 242.3:1

Raystown Branch Juniata River

25 Pa. Code § 93.9n classifies Raystown Branch Juniata River as Warm-Water Fishes (WWF) surface water. Based on the 2018 Integrated Report, Raystown Branch Juniata River, assessment unit ID 7438, is not impaired. A TMDL currently does not exist for this stream segment, therefore, no TMDL has been taken into consideration during this review.

PWS Intake

The nearest downstream Public Water System (PWS) is Mifflintown Borough Water System in Denholm, Juniata County, about 68 miles downstream of the discharge. The discharge will not impact the intake because of the distance, dilution, and effluent limits.

Treatment Facility Summary				
Treatment Facility Name: U S Army Corps Engineering - 7 Points Recreation Area WWTP				
WQM Permit No.	**Issuance Date**			
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Secondary	Extended Aeration	Hypochlorite	
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.15		Not Overloaded	Aerobic Digestion	Combination of methods

Changes Since Last Permit Issuance: none

The existing WWTP train is as follows:

Comminutors / Bar Screen (2) ⇒ Aeration Tanks (2) ⇒ Clarifiers (2) ⇒ Sand Filters (s) ⇒ Chlorine Contact Tank (liquid Chlorine) (1) ⇒ Sludge Holding Tanks (1) ⇒ Discharge

The system incorporates the chemical addition of sodium hypochlorite (for disinfection), alum sulfate (for phosphorus reduction), and hydrated lime (for pH adjustment).

Compliance History	
Summary of DMRs:	The DMRs reported from May 1, 2020 to April 30, 2021 is summarized in the Table below (Pages # 5 & 6).
Summary of Inspections:	7/27/2016: Mr. Clark, DEP WQS, conducted compliance evaluation inspection. The facility is usually in operation from April through October. The recommendations were to keep a record of all maintenance and repair work at the plant and record daily effluent grab time. Field test results were within permitted limits. Plant effluent appeared clear. There were no violations noted during inspection. 8/2/2017: Mr. Clark, DEP WQS, conducted compliance evaluation inspection. The facility is usually in operation from April through October. Field test results were within permitted limits. Plant effluent appeared clear. There were no violations noted during inspection. 8/8/2018: Mr. Clark, DEP WQS, conducted compliance evaluation inspection. The facility is usually in operation from April through October. Field test results were within permitted limits. Plant effluent appeared clear. There were no violations identified and noted during inspection. 8/23/2019: Mr. Clark, DEP WQS, conducted compliance evaluation inspection. The facility is usually in operation from April through October. The effluent was clear. There was recommendation to make necessary repairs to sand filter. Field tests results were within permitted limits. There were no violations noted.
Other Comments:	There are currently no open violations associated to the permittee or the facility.

Other Comments:

The table below summarizes the influent/effluent testing results submitted along with the application.

Influent Testing Results			*Effluent Testing Results*		
Parameter	**Min/Max Value**	**Average Value**	**Parameter**	**Min/Max Value**	**Average Value**
BOD_5 (mg/L)	756 mg/L	756 mg/L	pH (minimum)	6.1 S.U.	
BOD_5 (lbs/day)	44.14 lbs/day	44.14 lbs/day	pH (maximum)	8.11 S.U.	
TSS (mg/L)	548 mg/L	548 mg/L	D.O (minimum)	6.06 mg/L	8.11 mg/L
TSS (lbs/day)	32 lbs/day	32 lbs/day	TRC	0.10/0.89 mg/L	0.27 mg/L
TN (mg/L)	297.95 mg/L	297.95 mg/L	Fecal Coliform	2419.6 No./100mL	<9.9 No./100 mL
TN (lbs/day)	17.4 lbs/day	17.4 lbs/day	$CBOD_5$	<2.0/236 mg/L	<2.7 mg/L
TP (mg/L)	15.3 mg/L	15.3 mg/L	TSS	0.8/0.9 mg/L	<3.7 mg/L
TP (lbs/day)	0.89 lbs/day	0.89 lbs/day	NH_3-N	<0.1/45.5 mg/L	<10.4 mg/L
NH_3-N (mg/L)	91.62 mg/L	91.62 mg/L	TN	2.5/121.7 mg/L	47.9 mg/L
NH_3-N (lbs/day)	5.35 lbs/day	5.35 lbs/day	TP	0.06/1.4 mg/L	<0.57 mg/L
TDS (mg/L)	980 mg/L	980 mg/L	Temp	F	F
TDS (lbs/day)	57.21 lbs/day	57.21 lbs/day	TKN	< 0.5/36.6 mg/L	13.1 mg/L
TKN	294 mg/L	294 mg/L	NO_2-N + NO_3-N	2.28/114.3 mg/L	35.7 mg/L
NO_2-N + NO_3-N	3.95 mg/L	3.95 mg/L	TDS	164/1430 mg/L	611.4 mg/L
			Chloride	10.9/113 mg/L	58.2 mg/L
			Bromide	< 0.2/2.0 mg/L	< 2.0 mg/L
			Sulfate	24.1/250 mg/L	122.3 mg/L
			Oil and Grease	< 5.0 mg/L	< 5.0 mg/L
			Total Copper	< 0.01 mg/L	< 0.01 mg/L
			Total Lead	< 0.008 mg/L	< 0.008 mg/L
			Total Zinc	< 0.02 mg/L	< 0.02 mg/L

Compliance History

DMR Data for Outfall 001 (from May 1, 2020 to April 30, 2021)

Parameter	APR-21	MAR-21	FEB-21	JAN-21	DEC-20	NOV-20	OCT-20	SEP-20	AUG-20	JUL-20	JUN-20	MAY-20
Flow (MGD) Average Monthly	0.008						0.005	0.011	0.018	0.019	0.014	
Flow (MGD) Daily Maximum	0.036						0.017	0.026	0.035	0.035	0.047	
pH (S.U.) Minimum	6.81						6.25	6.1	6.28	6.14	6.70	
pH (S.U.) Maximum	8.48						7.49	7.78	7.63	7.88	7.71	
DO (mg/L) Minimum	8.9						7.36	7.15	6.69	6.45	6.23	
TRC (mg/L) Average Monthly	0.3						0.4	0.3	0.3	0.3	0.2	
TRC (mg/L) Instantaneous Maximum	0.44						0.89	0.49	0.73	0.58	0.59	
CBOD5 (lbs/day) Average Monthly	< 0.3						< 10	< 0.3	< 0.4	< 0.5	0.5	
CBOD5 (mg/L) Average Monthly	< 3.0						< 120.0	< 3.0	< 3.0	< 3.0	< 4.0	
TSS (lbs/day) Average Monthly	1.0						0.4	0.4	0.5	0.3	0.2	
TSS (mg/L) Average Monthly	10.0						7.0	5.0	3.0	2.0	2.0	
Total Dissolved Solids (mg/L) Average Monthly	442						1030	721	532	502	304	
Fecal Coliform (CFU/100 ml) Geometric Mean	3.0						1	< 156	1	< 2.0	2.0	
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	7.5						2	2419.6	1	5.2	4.1	
Nitrate-Nitrite (mg/L) Average Monthly	14.74						113.1	84.13	46.56	35.64	35.35	
Nitrate-Nitrite (lbs) Total Monthly	35						220	205	196	172	115	
Nitrate-Nitrite (lbs) Total Annual								835				

Total Nitrogen (mg/L) Average Monthly	14.74						120.823	84.13	57.16	67.23	43.068	
Total Nitrogen (lbs) Total Monthly	35						234	205	262	318	140	
Total Nitrogen (lbs) Total Annual								1074				
Ammonia (mg/L) Average Monthly	< 0.252						10.307	0.935	9.232	32.92	9.241	
Ammonia (lbs) Total Monthly	< 0.8						20	3.0	57	150	30	
Ammonia (lbs) Total Annual								243				
TKN (mg/L) Average Monthly	< 0.5						7.773	< 0.5	< 10.9	31.59	7.723	
TKN (lbs) Total Monthly	< 1.0						14	< 1.0	< 66	146	25	
TKN (lbs) Total Annual								241				
Total Phosphorus (lbs/day) Average Monthly	0.02						0.05	0.04	0.04	0.1	0.02	
Total Phosphorus (mg/L) Average Monthly	0.2						0.7	0.4	0.3	1.0	0.2	
Total Phosphorus (lbs) Total Monthly	0.5						1.4	1.2	1.4	4.5	0.7	
Total Phosphorus (lbs) Total Annual								8				
Sulfate (mg/L) Average Monthly	121.9						165	142	150	126	105	
Chloride (mg/L) Average Monthly	31.7						109	68.8	73	78.4	69.2	
Bromide (mg/L) Average Monthly	< 0.4						0.32	< 1.2	< 0.7	< 0.4	< 0.4	

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.15
Latitude 40º 23' 7.21" **Longitude** -78º 4' 2.79"
Wastewater Description: Sewage Effluent

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)

Water Quality-Based Limitations

Carbonaceous Biochemical Oxygen Demand ($CBOD_5$):
The attached computer printout of the WQM 7.0 stream model indicates that an average monthly limit of 25 mg/L, or secondary treatment, is adequate to protect the water quality of the stream. Due to anti-backsliding policy, the existing year-round average monthly limit (AML) of 25 mg/L, and IMAX of 50 mg/L will remain in the proposed permit. Recent DMRs and inspection reports show that the facility has been consistently achieving concentrations below this limit. Mass limits are calculated as follows:

Average monthly mass limit: 25 mg/L x 0.150 MGD x 8.34 = 31.27 (31.0) lbs/day

Ammonia (NH_3-N):
NH_3-N calculations are based on the Department's Implementation Guidance of Section 93.7 Ammonia Criteria, dated 11/4/97 (ID No. 391-2000-013). The attached printout of the WQM 7.0 data indicates that at a discharge of 0.15 MGD, limits (rounded according to the NPDES Technical Guidance 362-0400-001) of 25 mg/L NH_3-N as a monthly average and 50 mg/L NH_3-N instantaneous maximum are necessary to protect the aquatic life from toxicity effects.

The following data is necessary to determine the in-stream NH_3-N criteria used in the attached WQM 7.0 computer model of the stream:

- Discharge pH = 7.0 (Default)
- Discharge Temperature = 25°C (Default)
- Stream pH = 7.0 (Default)
- Stream Temperature = 25ºC (Default for WWF)
- Background NH_3-N = 0 (Default)

There are no NH3-N effluent limits in this permit. The "Monitor & Report" twice per month for average monthly will remain in the proposed permit.

pH:
The effluent discharge pH should remain above 6.0 and below 9.0 standard units according to 25 Pa. Code § 95.2(1) which is consistent with previous permit renewal.

Dissolved Oxygen (D.O.):
A minimum D.O. of 5.0 mg/L is required per 25 Pa. Code § 93.7. It is recommended that this limit be maintained in the proposed permit to ensure the protection of water quality standards. This approach is consistent with DEP's current Standard Operating Procedure (SOP) No. BPNPSM-PMT-033 and has been applied to other point source dischargers throughout the state.

Total Suspended Solids (TSS):
The existing technology-based limits of 30 mg/L average monthly, and 60 mg/L instantaneous maximum will remain in the permit based on the minimum level of effluent quality attainable by secondary treatment based on 25 Pa. Code § 92a.47 47 and 40CFR 133.102(b). Recent DMRs and inspection reports show that the facility has been consistently achieving these limits. Mass limits are calculated as follows:

Average monthly mass limit: 30 mg/L x 0.15 MGD x 8.34 = 37.5 (37.0) lbs/day

Fecal Coliform:
The recent coliform guidance in 25 Pa. Code § 92a.47.(a)(4) requires a summer technology limit of 200/100 ml as a geometric mean and an instantaneous maximum not greater than 1,000/100 ml and 25 Pa Code § 92a.47.(a)(5) requires a winter limit of 2,000/100 ml as a geometric mean and an instantaneous maximum not greater than 10,000/100 ml.

E. Coli:
As recommended by DEP's SOP no. BPNPSM-PMT-033, a routine monitoring for E. Coli will be included in the proposed permit under 25 Pa Code §92a.61. This requirement applies to all sewage dischargers greater than 0.002 MGD in their new and reissued permits. A monitoring frequency of 2/month will be included permit to be consistent with the recommendation from this SOP.

Total Residual Chlorine (TRC):
Based on the attached TRC Excel Spreadsheet calculator, which uses the equations and calculations from the Department's May 1, 2003 Implementation Guidance for Total Residual Chlorine (ID No. 391-2000-015), the facility's discharge must meet a monthly average limit of 0.5 mg/L and an instantaneous maximum limit of 1.6 mg/L. These limits are the same as those in the existing permit. The facility has been meeting the limits consistently.

Total Phosphorus:
Previous permit had average monthly concentration monitoring requirement 2.0 mg/l and instantaneous maximum limit of 4.0 mg/l with a minimum monitoring frequency of 2/month. Accordingly, existing TP limits will remain in the proposed permit. See the EPA guidance, Nutrient Criteria Technical Guidance Manual – Rivers and Streams, 07/2000 EPA-822-B-00-002, for more information about nutrient impacts on streams. Mass limits are calculated as follows:

Average monthly mass limit: 2.0 mg/L x 0.15 MGD x 8.34 = 2.5 lbs/day

Chesapeake Bay Strategy:
The Department formulated a strategy to comply with the EPA and Chesapeake Bay Foundation requirements by reducing point source loadings of Total Nitrogen (TN) and Total Phosphorus (TP). Sewage discharges have been prioritized by Central Office based on their delivered TN loadings to the Bay. The highest priority (Phases I, II, and III) dischargers will receive annual loading caps based on their design flow on August 29, 2005 and concentrations of 6 mg/L TN and 0.8 mg/L TP. These limits may be achieved through a combination of treatment technology, credits, or offsets. Phase IV (0.2 -0.4 MGD) will be required to monitor and report TN and TP during permit renewal monthly and Phase V (below 0.2 MGD) will monitor during current permit renewal once a year. However, any facility in Phases IV and V that undergoes expansion is subjected to cap load right away. This plant is classified as a phase V, will be required to monitor and report for Total Phosphorus, Ammonia-Nitrogen, Nitrate-Nitrite as N, Total Kjeldahl Nitrogen, and Total Nitrogen.

Additionally, according to SOP for establishing effluent limitation for individual sewage, monitoring frequency for nutrients should be equivalent to conventional pollutants in Table 6-3 of DEP's *Technical Guidance for the Development and Specification of Effluent Limitations* (362-0400-001) ("Permit Writer's Manual") where the facility discharges to nutrient-impaired waters, or a lesser frequency for discharges to waters not impaired for nutrients.

The 2/month "Monitor & Report" requirements for Ammonia-Nitrogen, Nitrate-Nitrite as N, and Total Kjeldahl Nitrogen; and 1/month calculation "Monitor & Report" for TN will remain in the proposed permit. The yearly calculation "report" for Nitrate-Nitrite as N, Total Kjeldahl Nitrogen, TP & TN will remain in the proposed permit.

Stormwater:
There is no stormwater outfall associated with this facility.

Toxics:
DEP utilities a Toxics Management Spreadsheet (last modified on March 2021 ver. 1.3) to facilitate calculations necessary for completing a reasonable potential analysis and determining WQBELs for toxic pollutants. The worksheet output indicates that there are no toxic pollutants of concern.

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Total Dissolved Solids:
TDS and its associated solids including Bromide, Chloride, and Sulfate have become statewide pollutants of concern. The requirement to monitor these pollutants must be considered under the criteria specified in 25 Pa. Code § 95.10 and the following January 23, 2014 DEP Central Office Directive:

For point source discharges and upon issuance or reissuance of an individual NPDES permit:

-Where the concentration of TDS in the discharge exceeds 1,000 mg/L, or the net TDS load from a discharge exceeds 20,000 lbs/day, and the discharge flow exceeds 0.1 MGD, Part A of the permit should include monitor and report for TDS, sulfate, chloride, and bromide. Discharges of 0.1 MGD or less should monitor and report for TDS, sulfate, chloride, and bromide if the concentration of TDS in the discharge exceeds 5,000 mg/L.

- Where the concentration of bromide in a discharge exceeds 1 mg/L and the discharge flow exceeds 0.1 MGD, Part A of the permit should include monitor and report for bromide. Discharges of 0.1 MGD or less should monitor and report for bromide if the concentration of bromide in the discharge exceeds 10 mg/L.

The facility has been monitoring for TDS, Bromide, Chloride, and Sulfate. However, the application for this renewal also reported 1,430 mg/L of TDS, 2.0 mg/L of Bromide, 113 mg/L of Chloride, and 250 mg/L of Sulfate as the maximum effluent concentration. Because this TDS level is well above the average of the TDS levels over the last five years, it is believed to be an outlier. Thus, monitoring and reporting for these pollutants will be removed from the proposed permit.

Antidegradation (93.4):
The effluent limits for this discharge have been developed to ensure that existing in-stream 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.

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

303(d) Listed Streams:
This discharge is not located on a 303(d) listed stream segment.

WQM 7.0:

The following two nodes were used in modeling:

Node 1:	Outfall 001 on Lake Raystown (13349)	
	Elevation:	786.5 ft (USGS National Map Viewer)
	Drainage Area:	939 $mi.^2$ (USGS PA StreamStats)
	River Mile Index:	15.0 (PA DEP eMapPA)
	Low Flow Yield:	0.06 $cfs/mi.^2$
	Discharge Flow:	0.15 MGD
Node 2:	At the confluence with Juniata River	
	Elevation:	584.28 ft (USGS National Map Viewer)
	Drainage Area:	962 $mi.^2$ (USGS PA StreamStats)
	River Mile Index:	0.001 (PA DEP eMapPA)
	Low Flow Yield:	0.06 $cfs/mi.^2$
	Discharge Flow:	0.00 MGD

ROCKDEP	Depth to rock	4.3	feet
CARBON	Percentage of area of carbonate rock	13.22	percent

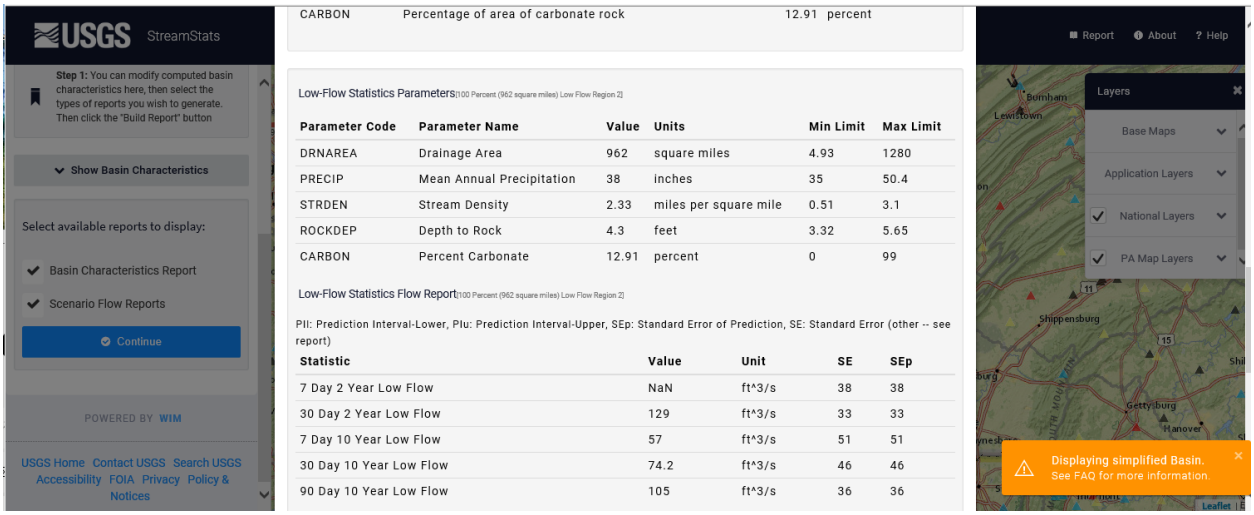
Low-Flow Statistics Parameters[100 Percent (939 square miles) Low Flow Region 2]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	939	square miles	4.93	1280
PRECIP	Mean Annual Precipitation	38	inches	35	50.4
STRDEN	Stream Density	2.32	miles per square mile	0.51	3.1
ROCKDEP	Depth to Rock	4.3	feet	3.32	5.65
CARBON	Percent Carbonate	13.22	percent	0	99

Low-Flow Statistics Flow Report[100 Percent (939 square miles) Low Flow Region 2]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	SEp
7 Day 2 Year Low Flow	98.4	ft^3/s	38	38
30 Day 2 Year Low Flow	127	ft^3/s	33	33
7 Day 10 Year Low Flow	55.9	ft^3/s	51	51
30 Day 10 Year Low Flow	72.8	ft^3/s	46	46



CARBON	Percentage of area of carbonate rock	12.91	percent

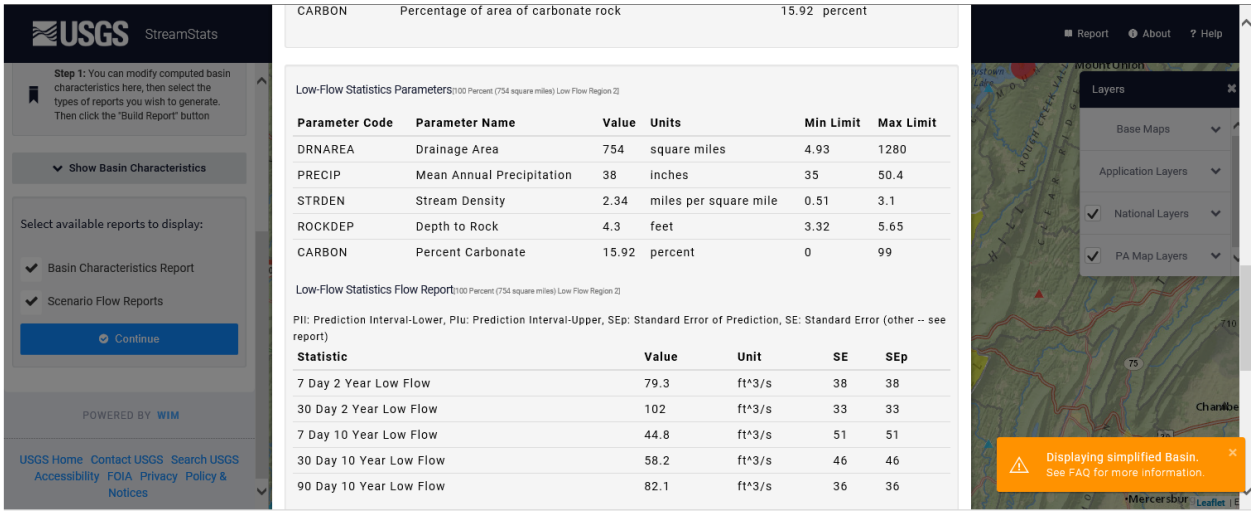
Low-Flow Statistics Parameters[100 Percent (962 square miles) Low Flow Region 2]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	962	square miles	4.93	1280
PRECIP	Mean Annual Precipitation	38	inches	35	50.4
STRDEN	Stream Density	2.33	miles per square mile	0.51	3.1
ROCKDEP	Depth to Rock	4.3	feet	3.32	5.65
CARBON	Percent Carbonate	12.91	percent	0	99

Low-Flow Statistics Flow Report[100 Percent (962 square miles) Low Flow Region 2]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	SEp
7 Day 2 Year Low Flow	NaN	ft^3/s	38	38
30 Day 2 Year Low Flow	129	ft^3/s	33	33
7 Day 10 Year Low Flow	57	ft^3/s	51	51
30 Day 10 Year Low Flow	74.2	ft^3/s	46	46
90 Day 10 Year Low Flow	105	ft^3/s	36	36



CARBON	Percentage of area of carbonate rock	15.92	percent

Low-Flow Statistics Parameters[100 Percent (754 square miles) Low Flow Region 2]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	754	square miles	4.93	1280
PRECIP	Mean Annual Precipitation	38	inches	35	50.4
STRDEN	Stream Density	2.34	miles per square mile	0.51	3.1
ROCKDEP	Depth to Rock	4.3	feet	3.32	5.65
CARBON	Percent Carbonate	15.92	percent	0	99

Low-Flow Statistics Flow Report[100 Percent (754 square miles) Low Flow Region 2]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	SEp
7 Day 2 Year Low Flow	79.3	ft^3/s	38	38
30 Day 2 Year Low Flow	102	ft^3/s	33	33
7 Day 10 Year Low Flow	44.8	ft^3/s	51	51
30 Day 10 Year Low Flow	58.2	ft^3/s	46	46
90 Day 10 Year Low Flow	82.1	ft^3/s	36	36

TRC EVALUATION

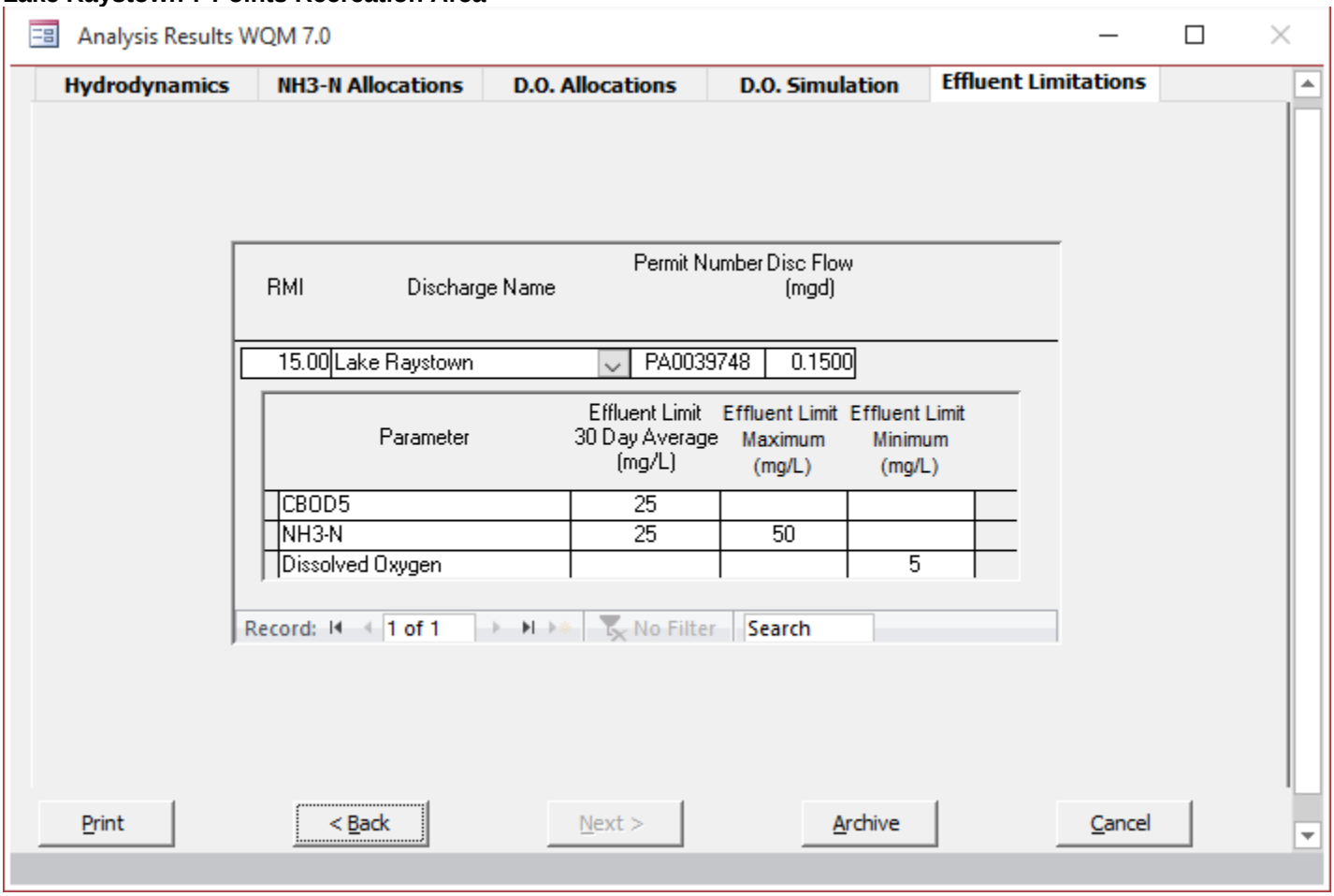
Input appropriate values in A3:A9 and D3:D9

56.34	= Q stream (cfs)	0.5	= CV Daily
0.15	= 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)		=Decay Coefficient (K)

Source	Reference	AFC Calculations		Reference	CFC Calculations	
TRC	1.3.2.iii	WLA afc =	77.470	1.3.2.iii	WLA cfc =	75.519
PENTOXSD TRG	5.1a	LTAMULT afc =	0.373	5.1c	LTAMULT cfc =	0.581
PENTOXSD TRG	5.1b	LTA_afc=	28.867	5.1d	LTA_cfc =	43.903

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)**


Analysis Results WQM 7.0
Hydrodynamics
NH3-N Allocations
D.O. Allocations
D.O. Simulation
Effluent Limitations
RMI
Discharge Name
Permit Number
Disc Flow (mgd)
15.00
Lake Raystown
PA0039748
0.1500
Parameter
Effluent Limit 30 Day Average (mg/L)
Effluent Limit Maximum (mg/L)
Effluent Limit Minimum (mg/L)
CBOD5
25
NH3-N
25
50
Dissolved Oxygen
5
Record: 1 of 1
No Filter
Search
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Next >
Archive
Cancel

Analysis Results WQM 7.0

Hydrodynamics | NH3-N Allocations | D.O. Allocations | D.O. Simulation | Effluent Limitations

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
15.000	0.150	25.000	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WD Ratio**	**Reach Velocity (fps)**
131.441	1.084	121.204	0.397
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.09	0.016	0.10	1.029
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
8.230	5.322	Tsivoglou	5

Reach Travel Time (days)
2.310

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.231	2.08	0.08	7.54
0.462	2.08	0.06	7.54
0.693	2.07	0.05	7.54
0.924	2.06	0.04	7.54
1.155	2.05	0.03	7.54
1.386	2.04	0.02	7.54
1.617	2.03	0.02	7.54
1.848	2.02	0.02	7.54
2.079	2.01	0.01	7.54
2.310	2.00	0.01	7.54

Record: 1 of 1 | No Filter | Search

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rptEffLimits

WQM 7.0 Effluent Limits

Page: 1 | No Filter

rpt_WLA

WQM 7.0 Wasteload Allocations

NH3-N Acute Allocations

NH3-N Chronic Allocations

Dissolved Oxygen Allocations

Page: 1 | No Filter

rptDOSim

WQM 7.0 D.O.Simulation

rptModelSpecs

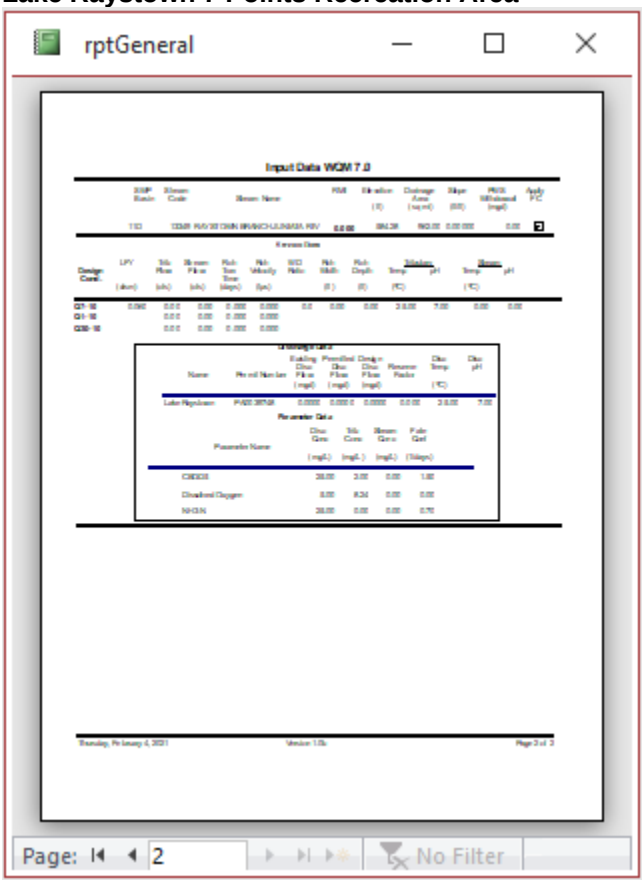
WQM 7.0 Modeling Specifications

rptHydro

WQM 7.0 Hydrodynamic Outputs

rptGeneral

Input Data WQM 7.0


rptGeneral
Input Data WQM 7.0
Page: 2
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Existing Effluent Limitations and Monitoring Requirements

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	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
$CBOD_5$	31	XXX	XXX	25.0	XXX	50	2/month	8-Hr Composite
TSS	37	XXX	XXX	30.0	XXX	60	2/month	8-Hr Composite
Total Dissolved Solids	XXX	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Fecal Coliform (CFU/100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	2/month	Grab
Fecal Coliform (CFU/100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2,000 Geo Mean	XXX	10,000	2/month	Grab
Total Phosphorus	2.5	XXX	XXX	2.0	XXX	4	2/month	8-Hr Composite
Sulfate	XXX	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Chloride	XXX	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Bromide	XXX	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite

Existing Effluent Limitations and Monitoring Requirements

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Monthly	Annual	Monthly	Monthly Average	Maximum	Instant. Maximum		
Ammonia-N	Report	Report	XXX	Report	XXX	XXX	2/month	8-hrs Composite
Kjeldahl-N	Report	Report	XXX	Report	XXX	XXX	2/month	8-hrs Composite
Nitrate-Nitrite as N	Report	Report	XXX	Report	XXX	XXX	2/month	8-hrs Composite
Total Nitrogen	Report	Report	XXX	Report	XXX	XXX	1/month	Calculation
Total Phosphorus	Report	Report	XXX	Report	XXX	XXX	2/month	8-hrs Composite

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	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
$CBOD_5$	31.0	XXX	XXX	25.0	XXX	50.0	2/month	8-Hr Composite
TSS	37.0	XXX	XXX	30.0	XXX	60.0	2/month	8-Hr Composite
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	2/month	Grab
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2,000 Geo Mean	XXX	10,000	2/month	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	2/month	Grab
Total Phosphorus	2.5	XXX	XXX	2.0	XXX	4.0	2/month	8-Hr Composite

Compliance Sampling Location:

Other Comments:

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
	Monthly	Annual	Monthly	Monthly Average	Maximum	Instant. Maximum		
Ammonia-N	Report	Report	XXX	Report	XXX	XXX	2/month	8-hrs Composite
Kjeldahl-N	Report	Report	XXX	Report	XXX	XXX	2/month	8-hrs Composite
Nitrate-Nitrite as N	Report	Report	XXX	Report	XXX	XXX	2/month	8-hrs Composite
Total Nitrogen	Report	Report	XXX	Report	XXX	XXX	1/month	Calculation
Total Phosphorus	Report	Report	XXX	Report	XXX	XXX	2/month	8-hrs Composite

Compliance Sampling Location:

Other Comments:

Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment)
☒	Toxics Management Spreadsheet (see Attachment)
☒	TRC Model Spreadsheet (see Attachment)
☐	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:
☐	Other: