pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0045004**
Facility Type	**Municipal**	APS ID	**274816**
Major / Minor	**Minor**	Authorization ID	**1434584**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Lake Meade Municipal Authority**	Facility Name	**Lake Meade STP**
Applicant Address	59 Curtis Drive	Facility Address	59 Curtis Drive
	East Berlin, PA 17316-9220		East Berlin, PA 17316-9220
Applicant Contact	Adam Ebersole	Facility Contact	Adam Ebersole
Applicant Phone	(717) 259-9998	Facility Phone	(717) 259-9998
Client ID	6163	Site ID	452153
Ch 94 Load Status	Not Overloaded	Municipality	Reading Township
Connection Status	No Limitations	County	Adams
Date Application Received	March 28, 2023	EPA Waived?	Yes
Date Application Accepted	April 6, 2023	If No, Reason	

Purpose of Application: NPDES permit renewal.

Summary of Review

William F. Hill & Associates, on behalf of the Lake Meade Municipal Authority (Authority/Permittee), applied to the Pennsylvania Department of Environmental Protection (DEP) for issuance of the NPDES permit. The permit was reissued on September 24, 2018 and became effective on October 1, 2018. The permit expires on September 30, 2023.

The average annual design flow and hydraulic design capacity is 0.35 MGD and the organic loading capacity is 847 lbs BOD_5/day. The treated effluent is discharged to Mud Run. This facility receives 75.0% of its flow from Reading Township, and 25.0% from Latimore Township. The 2023 application states that there are no industrial users.

WQM Part II Permit No. 0105402 was issued on 6/7/2006, and 0105402 A-1 amendment was issued on 8/23/2011. WQG02010602 was issued on 10/24/2006. WQM Part II Permit No. 0115402 was issued on 1/6/2016. WQM Part II Permit for pump station NO. 0117402 was issued on 9/15/2017. WQM Part II Permit No. 0119401 was issued on 10/24/2019.

Sludge use and disposal description and location(s): N/A because sludge is hauling by Pecks Septic contractor.

Changes from the previous permit: The E. Coli. monitoring and report requirements will add to the proposed permit. Changed the Total Copper limit to 0.022 mg/L average monthly, & 0.035 mg/L daily maximum, and average monthly mass limit to 0.06 lbs/day.

Based on the review outlined in this fact sheet, it is recommended that the permit be drafted. A public notice of the draft permit will be published in the *Pennsylvania Bulletin* for public comments for 30 days.

Approve	Deny	Signatures	Date
X		*Hilaryle* Hilary H. Le / Environmental Engineering Specialist	August 18, 2023
X		*Maria D. Bebenek for* Daniel W. Martin, P.E. / Environmental Engineer Manager	September 19, 2023

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.35
Latitude	39º 59' 46.37"	Longitude	-77º 1' 58.08"
Quad Name	Hampton	Quad Code	
Wastewater Description:	Sewage Effluent		
Receiving Waters	Mud Run (WWF)	Stream Code	08622
NHD Com ID	57468725	RMI	3.84 miles
Drainage Area	10.3 mi.^{2}	Yield (cfs/mi^2)	See Comments below
Q_{7-10} Flow (cfs)	See comments below	Q_{7-10} Basis	See comments below
Elevation (ft)	453.55	Slope (ft/ft)	
Watershed No.	7-F	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	Algae, Siltation		
Source(s) of Impairment	Agriculture, Urban Runoff/Storm Sewers		
TMDL Status	None proposed	Name	
Nearest Downstream Public Water Supply Intake	Wrightsville Boro Water System, York County		
PWS Waters	Susquehanna River	Flow at Intake (cfs)	
PWS RMI	28.51 miles	Distance from Outfall (mi)	Approximate 50.0 miles

Changes Since Last Permit Issuance:

Drainage Area

The discharge is to Mud Run at RMI 3.84 miles. A drainage area upstream of the discharge is estimated to be 10.3 mi.^{2}, according to USGS PA StreamStats available at https://streamstats.usgs.gov/ss/.

Streamflow

There is a category B-1 High Hazard Dam, 01-081, located approximately 0.9 mile upstream of the discharge point. The minimum release of the Dam will be taken into consideration to calculate the stream flow. There are also some tributaries between the Dam and discharge point. USGS StreamStats, was utilized to calculate the drainage area at both points. The previous protection report calculated the yield of the entire Bermudian Creek and it was 0.08 cfs/mi^2 (7.74 cfs/93.4 mi.^{2}). The Dam Inspection Report submitted by Lake Meade Property Owner's Association for 2017 indicated an average minimum release rate to be 102,034 GPD or 0.158 cfs. The default (per 391-2000-007) Q_{1-10} : Q_{7-10} and Q_{30-10} : Q_{7-10} ratios are 0.64 and 1.36. The effective drainage area at discharge point is calculated as below:

Effective Drainage area at discharge point = Drainage area at discharge point – drainage area at dam
= 10.3 mi^2 – 8.86 mi^2 = 1.44 mi^2

Q_{7-10} at discharge point = minimum release from dam + tributary contribution between dam and discharge
= 0.158 cfs + (1.44 mi^2 * 0.08 cfs/mi^2) = 0.273 cfs

Q_{30-10} = 0.158 cfs + (1.36 * 1.44 mi^2 * 0.08 cfs/mi^2) = 0.315 cfs

Q_{1-10} = 0.158 cfs + (0.64 * 1.44 mi^2 * 0.08 cfs/mi^2) = 0.273 cfs

The previous fact sheet indicated the minimum discharge from the Dam was 70,000 GPD, and flows were calculated accordingly. During the current renewal, the submitted Dam inspection report was taken into consideration which showed minimum release requirement of 100,000 GPD was met. The updated flow numbers will be used in water quality modeling. The Dam calculation from the previous review dated 6/7/2018 is in this factsheet, pages 19 & 20.

Public Water Supply

The nearest downstream public water supply intake is for Wrightsville Boro Water System in York County on Susquehanna River, approximately 50.0 miles downstream of this discharge. Considering distance and dilution, the discharge is not expected to impact the water supply.

303d Listed Streams
The discharge from this facility is in Mud Run at 3.84 RMI which is impaired for Aquatic Life use due to siltation (agricultural) and excessive algal growth (agricultural and hydromodification). It is also impaired for Recreation use due to pathogens from unknown source. The discharge from this facility is expected not to contribute to the existing impairment.

Treatment Facility Summary

Treatment Facility Name: Lake Meade STP

WQM Permit No.	Issuance Date
0119401	10/24/2019
0117402	9/15/2017
0105402 11-1	8/23/2011

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Tertiary	Sequencing Batch Reactor W/Sol Removal	Ultraviolet	0.35

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.35	847	Not Overloaded	Aerobic Digestion	

Changes Since Last Permit Issuance: none

Other Comments:

Per DEP's recent visit to the WWTP on May 12, 2021, the treatment facility consists of the following units:
- One grit chamber
- One pump station
- One mechanical screen
- Two Sequencing Batch Reactors (SBRs)
- One UV
- One digester

Chemical used:
Aluminium Sulphate is used for phosphorus control at rate of 20 gpd.

Industrial/Commercial Users:
The permit application indicated there are no commercial or industrial contributors to the treatment plant.

Biosolids:
The total sewage sludge/biosolids production within the facility for the previous year was 53.24 dry tons.

Industrial/Commercial Users:
The permit application indicated there is no industrial/commercial contributor to the treatment plant.

Compliance History	
Summary of DMRs:	A summary of past 12-month DMRs is presented on pages 6, 7, & 8.
Summary of Inspections:	**5/12/2021:** Mr. Bettinger, DEP's WQS, conducted a compliance evaluation inspection. Recommendations were investigating and bringing continuous effluent pH and D.O. monitoring probes back into service, increasing the frequency of process control analysis (MLSS and Settleability), and locating effluent composite sampler after UV disinfection. The facility reported Ammonia-Nitrogen exceedances in December 2020 and January 2021. **4/27/2020:** Mr. Bettinger, DEP's WQ Environmental Trainee, conducted an administrative inspection. There were no violations identified during inspection.
Other Comments:	There were four open violations for Safe Drinking Water - Failure to follow approved methods for sampling and analysis (Violation IDs 983380, 983381, 983382, & 983383) on 1/31/2023

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

Influent Testing Results

Parameter	Min/Max Value	Average Value
BOD_5 (mg/L)	540 mg/L	229 mg/L
BOD_5 (lbs/day)	599 lbs/day	240 lbs/day
TSS (mg/L)	608 mg/L	629 mg/L
TSS (lbs/day)	629 lbs/day	170 lbs/day
TN (mg/L)	64.01 mg/L	64.01 mg/L
TN (lbs/day)	61.9 lbs/day	61.9 lbs/day
TP (mg/L)	6.0 mg/L	6.0 mg/L
TP (lbs/day)	5.8 lbs/day	5.8 lbs/day
NH_3-N (mg/L)	40.0 mg/L	40.0 mg/L
NH_3-N (lbs/day)	38.7 lbs/day	38.7 lbs/day
TDS (mg/L)	578 mg/L	578 mg/L
TDS (lbs/day)	559.2 lbs/day	559.2 lbs/day
TKN	60.0 mg/L	60.0 mg/L
NO_2-N + NO_3-N	4.01 mg/L	4.01 mg/L

Effluent Testing Results

Parameter	Min/Max Value	Average Value
pH (minimum)	6.5 S.U.	
pH (maximum)	7.0 S.U.	
D.O (minimum)	6.7 mg/L	mg/L
TRC	mg/L	mg/L
Fecal Coliform	2420 No./100mL	75.9 No./100 mL
$CBOD_5$	4.0mg/L	< 2.5 mg/L
TSS	10.0 mg/L	2.2 mg/L
NH_3-N	26.0 mg/L	< 0.65 mg/L
TN	< 23.1 mg/L	< 9.28 mg/L
TP	3.3 mg/L	< 1.29 mg/L
Temp	54 F	54 F
TKN	11 mg/L	< 1.14 mg/L
NO_2-N + NO_3-N	< 19.4 mg/L	< 7.68 mg/L
TDS	530 mg/L	530 mg/L
Chloride	130 mg/L	130 mg/L
Bromide	0.15 mg/L	0.15 mg/L
Sulfate	120 mg/L	120 mg/L
Oil and Grease	< 5.0 mg/L	< 5.0 mg/L
Total Copper	0.032 mg/L	0.0163 mg/L
Total Lead	< 0.001 mg/L	< 0.001 mg/L
Total Zinc	0.038 mg/L	0.038 mg/L

Compliance History

DMR Data for Outfall 001 (from July 1, 2022 to June 30, 2023)

Parameter	JUN-23	MAY-23	APR-23	MAR-23	FEB-23	JAN-23	DEC-22	NOV-22	OCT-22	SEP-22	AUG-22	JUL-22
Flow (MGD) Average Monthly	0.121	0.137	0.128	0.134	0.119	0.134	0.151	0.119	0.119	0.118	0.126	0.133
Flow (MGD) Daily Maximum	0.148	0.420	0.163	0.333	0.140	0.184	0.395	0.147	0.147	0.158	0.146	0.176
pH (S.U.) Daily Minimum	7.0	6.7	6.5	6.7	6.7	6.7	6.6	6.6	6.7	6.5	6.7	6.7
pH (S.U.) Daily Maximum	7.2	7.2	7.0	6.9	6.9	6.9	6.8	6.9	6.9	6.9	6.9	6.9
DO (mg/L) Daily Minimum	6.7	6.6	7.1	7.3	7.9	7.9	8.1	8.0	7.7	7.1	6.9	6.7
CBOD5 (lbs/day) Average Monthly	< 2.3	< 2.5	< 2.5	< 2.4	< 2.4	< 3.5	< 2.4	< 2.4	< 2.4	< 2.4	< 2.4	< 2.5
CBOD5 (lbs/day) Weekly Average	< 2.3	< 2.8	< 2.7	< 2.6	3.0	6.1	< 2.6	< 2.9	< 2.9	< 2.7	< 2.7	< 2.6
CBOD5 (mg/L) Average Monthly	< 2.4	< 2.4	< 2.4	< 2.4	< 2.6	< 3.5	< 2.5	< 2.4	< 2.4	< 2.4	< 2.4	< 2.4
CBOD5 (mg/L) Weekly Average	< 2.4	< 2.4	< 2.4	< 2.4	3.0	6.6	2.6	< 2.4	< 2.4	< 2.4	< 2.4	< 2.4
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	213	251	286	255	264	287	251	212	212	242	210	289
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	283	329	315	309	326	343	345	266	264	295	243	439
BOD5 (mg/L) Raw Sewage Influent Average Monthly	223	243	176	256	279	277	254	218	209	245	208	278
TSS (lbs/day) Average Monthly	2.0	3.0	2.0	2.0	2.0	1.0	1.0	2.0	2.0	2.0	1.0	2.0
TSS (lbs/day) Raw Sewage Influent Average Monthly	118	181	224	172	167	283	207	124	146	316	128	248
TSS (lbs/day) Raw Sewage Influent Daily Maximum	192	306	301	281	289	373	295	213	269	432	233	386
TSS (lbs/day) Weekly Average	4.0	6.0	2.0	3.0	3.0	2.0	2.0	3.0	4.0	4.0	1.0	2.0
TSS (mg/L) Average Monthly	2.0	3.0	2.0	2.0	2.0	1.0	1.0	2.0	2.0	3.0	1.0	2.0

TSS (mg/L) Raw Sewage Influent Average Monthly	123	177	218	174	174	270	208	129	145	321	129	240
TSS (mg/L) Weekly Average	4.0	5.0	2.0	3.0	3.0	2.0	2.0	3.0	3.0	4.0	1.0	2.0
Fecal Coliform (No./100 ml) Geometric Mean	< 4	< 1	< 80	< 5	35	16	126	8	90	< 47	< 2	11
Fecal Coliform (No./100 ml) IMAX	173	1	> 2420	61	219	82	1120	204	> 2420	99	49	613
UV Intensity (mW/cm²) Daily Minimum	93.20	87.41	87.43	88.16	88.91	89.58	90.33	91.10	91.81	92.57	93.29	87.48
Nitrate-Nitrite (mg/L) Average Monthly	< 7.2	< 5.0	< 2.1	< 11.4	< 7.3	< 12.4	< 14.4	14	< 7.7	< 4.3	2.45	< 2.9
Nitrate-Nitrite (lbs) Total Monthly	< 209	< 145	< 62	< 330	< 194	< 353	< 424	392	< 223	< 116	85	< 94
Total Nitrogen (mg/L) Average Monthly	< 7.8	< 6.1	< 3.9	< 11.9	< 8.03	< 12.9	< 14.9	< 14.5	< 8.2	< 4.8	3.1	< 3.4
Total Nitrogen (lbs) Total Monthly	< 226	< 177	< 115	< 345	< 214	< 367	< 424	< 406	< 237	< 130	107	< 111
Total Nitrogen (lbs) Total Annual										< 3786		
Ammonia (lbs/day) Average Monthly	< 0.1	< 0.1	< 0.1	< 0.1	< 0.09	< 0.1	< 0.1	< 0.1	< 0.8	< 0.1	< 0.1	< 0.1
Ammonia (mg/L) Average Monthly	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.8	< 0.1	< 0.1	< 0.1
Ammonia (lbs) Total Monthly	< 2.9	< 3.3	< 3.1	< 3.1	< 2.7	< 3.2	< 3.0	< 2.9	< 23.5	< 3.0	< 3.1	< 3.2
Ammonia (lbs) Total Annual										< 37		
TKN (mg/L) Average Monthly	0.6	1.1	1.8	< 0.50	0.74	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.65	< 0.5
TKN (lbs) Total Monthly	17.0	32	53	< 14.0	20	< 14.0	< 0.5	< 14	< 14	< 14	23	< 16
Total Phosphorus (lbs/day) Average Monthly	1.2	1.7	1.0	1.2	1.8	2.5	0.9	1.7	0.5	1.4	1.2	1.0
Total Phosphorus (mg/L) Average Monthly	1.2	1.7	1.0	1.2	1.9	2.5	0.9	1.7	0.5	1.4	1.2	1.0
Total Phosphorus (lbs) Total Monthly	34.8	52.8	31	37.6	49.4	76.7	27.8	49.7	15.2	42.4	36.4	32.1
Total Phosphorus (lbs) Total Annual										502		

Total Copper (lbs/day) Average Monthly	0.008	0.01	0.008	0.009	0.01	0.01	0.01	0.02	0.01	0.008	0.009	0.01
Total Copper (mg/L) Average Monthly	0.009	0.010	0.008	0.009	0.011	0.012	0.014	0.016	0.010	0.009	0.009	0.013
Total Copper (mg/L) Daily Maximum	0.011	0.012	0.009	0.011	0.013	0.015	0.015	0.018	0.024	0.013	0.01	0.016

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.35
Latitude 39º 59' 46.37" **Longitude** -77º 1' 58.08"
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)

Comments: Total Residual Chlorine is not applied.

Water Quality-Based Limitations

Ammonia (NH_3-N):
NH_3N 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 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	=	20ºC	(Default)
*	Background NH_3-N	=	0 mg/L	(Default)

Regarding NH_3-N limits, the attached computer printout of the WQM 7.0 stream model (version 1.1) indicates that a limit of 2.22 mg/L as a monthly average and 4.44 mg/L instantaneous maximum (IMAX) are necessary to protect the aquatic life from toxicity effects at the point of discharge. However, the existing limits of 1.5 mg/L monthly average & 3.0 mg/L IMAX are more stringent and will remain in the proposed permit. Per anti-backsliding policy, the existing winter average monthly limit of 4.5 mg/L & IMAX limit of 9.0 mg/L will remain in place. Recent DMRs and inspection reports show that the facility has been consistently achieving these limits. Mass limits are calculated as follows:

Summer average monthly mass limit: 1.5 mg/L x 0.35 MGD x 8.34 = 4.38 (4.3) lbs/day
Winter average monthly mass limit: 4.5 mg/L x 0.35 MGD x 8.34 = 13.14 (13.0) lbs/day

Dissolved Oxygen (D.O.):
A minimum of 5.0 mg/L for D.O. is an existing effluent limit and will remain unchanged in the draft permit as recommended by DEP's SOP. 5.0 mg/L is taken directly from 25 Pa. Code § 93.7(a) (i.e., water quality criteria for WWF waters) and it is also determined to be appropriate per water quality modeling.

pH:
The effluent discharge pH should remain above 6.0 and below 9.0 standard units according to 25 Pa. Code § 95.2(1).

Carbonaceous Biochemical Oxygen Demand ($CBOD_5$):
The attached computer printout of the WQM 7.0 stream model (ver. 1.1) indicates that a monthly average limit of 25.0 mg/L, or secondary treatment, is adequate to protect the water quality of the stream. However, the existing permit 10.0 mg/L as AML, 15.0 mg/L as weekly average limit (AWL), & 20.0 mg/L as IMAX are more stringent and will remain in the proposed permit. Recent DMRs and inspection reports show that the facility has typically been achieving concentrations below this limit. Mass limits are calculated as follows:

Summer Average monthly mass limit: 10.0 mg/L x 0.35 MGD x 8.34 = 29.19 (29.0) lbs/day
Summer Average weekly mass limit: 15.0 mg/L x 0.35 MGD x 8.34 = 43.79 (43.0) lbs/day

These values are rounded down to 29.0 lbs/day and 43.0 lbs/day, respectively. The minimum monitoring frequency will remain the same as 1/week.

Total Suspended Solids (TSS):
The existing technology-based limits of 10.0 mg/L average monthly, 15.0 mg/L weekly average, and 20.0 mg/L IMAX will remain in the proposed permit based on the minimum level of effluent quality attainable by secondary treatment based on 25 Pa. Code § 92a.47. 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: 10.0 mg/L x 0.35 MGD x 8.34 = 29.19 (29.0) lbs/day
Average weekly mass limit: 15.0 mg/L x 0.35 MGD x 8.34 = 43.79 (43.0) lbs/day

The average monthly and weekly average mass loadings will be rounded down to 29 lbs/day and 43 lbs/day, respectively.

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 1,000/100ml and § 92a.47.(a)(5) requires a winter limit of 2,000/100ml as a geometric mean and an instantaneous maximum not greater than 10,000/100ml.

E. Coli:
As recommended by DEP's SOP No. BCW-PMT-033, version 1.9 revised March 22, 2021, 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 1/quarter will be included in the permit to be consistent with the recommendation from this SOP.

UV:
The UV system daily monitor and report the UV light intensity (mW/cm^2) will remain in the proposed permit.

Raw Sewage Influent Monitoring:
As a result of negotiation with EPA, influent monitoring of TSS and BOD_5 are required for any POTWs; therefore, influent sampling of BOD_5 and TSS will remain in the proposed permit. A 24-hr composite sample type will be required to be consistent with the proposed sampling frequency for TSS and BOD_5 in the effluent.

Total Phosphorus:
The existing permit average monthly TP concentration of 2.0 mg/L, and 4.0 mg/L IMAX will remain in the proposed permit. Mass average monthly of 5.8 lbs/day is also in the proposed permit.

Chesapeake Bay Strategy:
Phase 2 WIP identifies Cassville WWTP as a non-significant Phase 4 facility. DEP's SOP mentioned that for facilities with design flows ≥0.2 MGD and <0.4 MGD will include monitoring, at a minimum, for Total Nitrogen and Total Phosphorus, with a monitoring frequency specified in DEP's technical guidance. Therefore, 1/month TN species (such as Ammonia-Nitrogen, Nitrate-Nitrite as N, Total Kjeldahl Nitrogen, and Total Nitrogen) and TP monitoring requirements will remain in the proposed permit. The yearly calculation "report" for TP & TN will remain in the proposed permit.

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

Toxics:
The data was analyzed based on the guidelines found in DEP's Water Quality Toxics Management Strategy (Document No. 361-0100-003, version 1.4, revised 5/2023) and DEP's SOP No. BPNPSM-PMT-033. Spreadsheet results are attached to this fact sheet. The Toxics Management Spreadsheet uses the following logic:

a. Establish average monthly and IMAX limits in the draft permit where the maximum reported concentration exceeds 50% of the WQBEL.
b. For non-conservative pollutants, establish monitoring requirements where the maximum reported concentration is between 25% - 50% of the WQBEL.
c. For conservative pollutants, establish monitoring requirements where the maximum reported concentration is between 10%-50% of the WQBEL.

Therefore, the results are as follows.

- The TMS analysis results indicated Total Copper limit of 0.022 mg/L average monthly, & 0.035 mg/L daily maximum which are slightly more stringent and will replace in the proposed permit. Recent DMRs and inspection reports show that the facility has typically been achieving concentrations below this limit. Mass limits are calculated as follows:

  Average monthly mass limit: 0.022 mg/L x 0.35 MGD x 8.34 = 0.064 (0.06) lbs/day

- Total Zinc pollutant has no reasonable potential (no-RP) discharge concentration greater than 10% WQBEL, per DEP's SOP No. BPNPSM-PMT-033, therefore, the monitoring and reporting requirements of this pollutant is not necessary to add to the proposed permit.

WETT:
Minor facilities and facilities without a formal EPA approved pretreatment program are exempted from WETT.

Anti-Backsliding:
The proposed limits are at least as stringent as are in existing permit; therefore, anti-backsliding is not applicable

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.

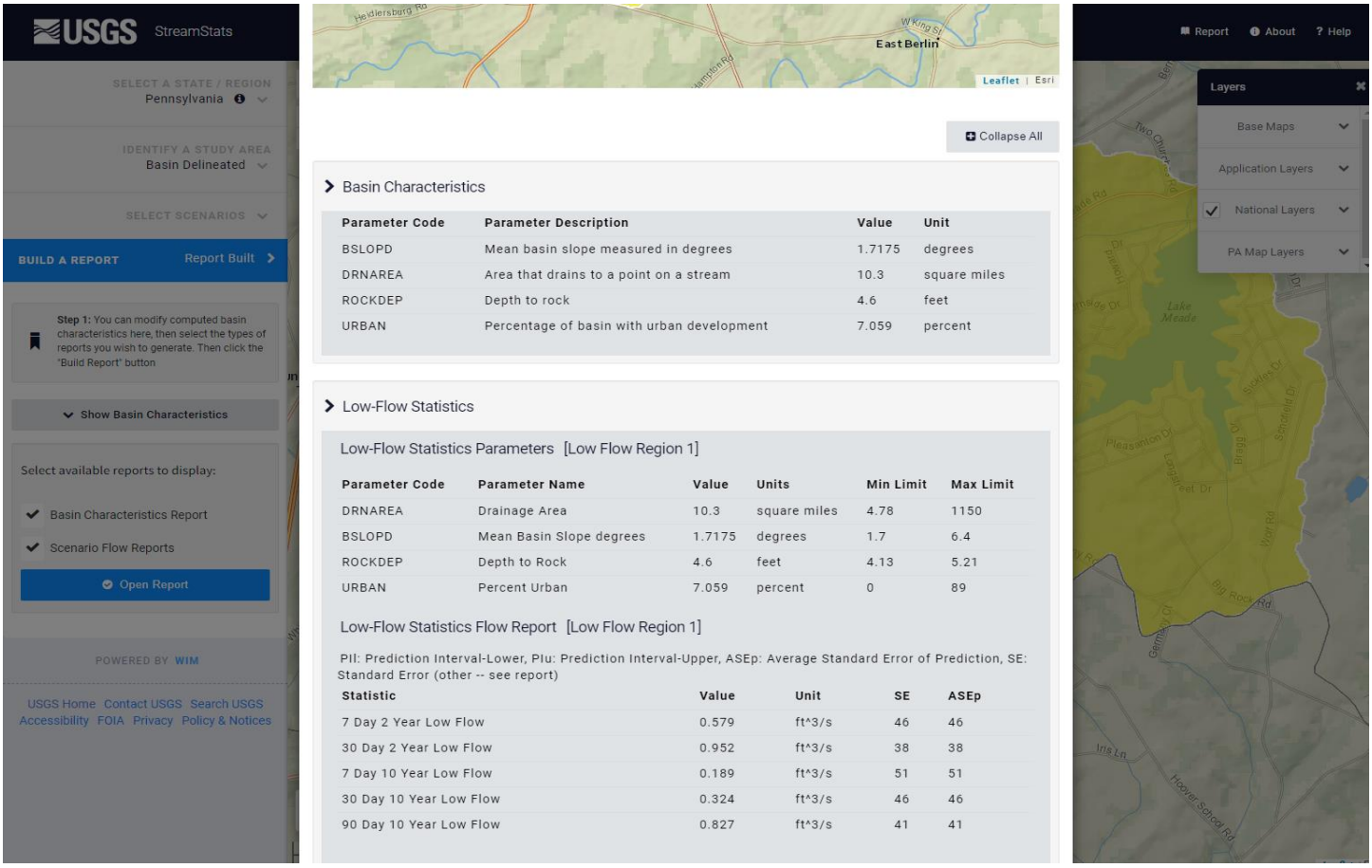
WQM 7.0:
The following data were used in the attached computer model (WQM 7.0) of the stream:

*	Discharge pH	7.0	(Default)
*	Discharge Temperature	25°C	(Default per 391-2000-013)
*	Stream pH	7.0	(Default per 391-2000-013)
*	Stream Temperature	20°C	(Default per 391-2000-013)

The following two nodes were used in modeling:

Node 1:	Outfall 001 at Mud Run (08622)	
	Elevation:	453.65 ft (USGS National Map)
	Drainage Area:	10.3 mi^2 (USGS StreamStats)
	River Mile Index:	3.84 (PA DEP eMapPA)
	Low Flow Yield:	0.018 cfs/mi^2 (calculated, see below)
	Discharge Flow:	0.35 MGD
Node 2:	At the confluence UNT to 08626	
	Elevation:	440.23 ft (USGS National Map)
	Drainage Area:	10.8 mi^2 (USGS StreamStats)
	River Mile Index:	3.47 (PA DEP eMapPA)
	Low Flow Yield:	0.029 cfs/mi^2 (calculated, see below)
	Discharge Flow:	0.00 MGD

LFY at discharge point: 0.189 cfs/10.3 mi^2 = 0.018 cfs/mi^2
Q_{7-10} at node 2 = 0.158 cfs + 0.075*(10.8 – 8.86) = 0.31 cfs
LFY at node 2 = 0.31 cfs/10.8 mi^2 = 0.029 cfs/mi^2


USGS StreamStats
SELECT A STATE / REGION
Pennsylvania
IDENTIFY A STUDY AREA
Basin Delineated
SELECT SCENARIOS
BUILD A REPORT
Report Built
Step 1: You can modify computed basin characteristics here, then select the types of reports you wish to generate. Then click the "Build Report" button
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Select available reports to display:
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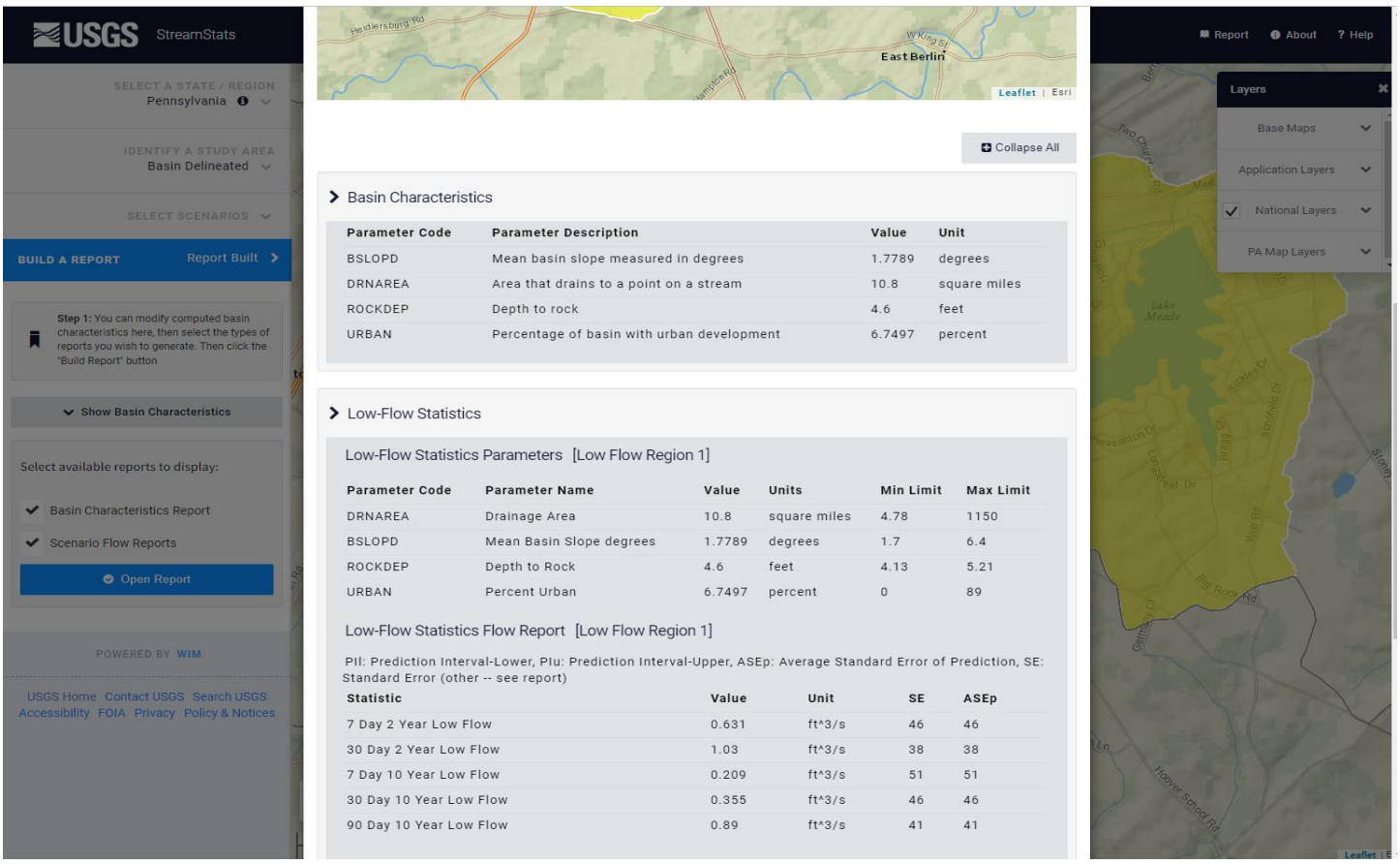
Collapse All
Basin Characteristics
Parameter Code | Parameter Description | Value | Unit
BSLOPD | Mean basin slope measured in degrees | 1.7175 | degrees
DRNAREA | Area that drains to a point on a stream | 10.3 | square miles
ROCKDEP | Depth to rock | 4.6 | feet
URBAN | Percentage of basin with urban development | 7.059 | percent
Low-Flow Statistics
Low-Flow Statistics Parameters [Low Flow Region 1]
Parameter Code | Parameter Name | Value | Units | Min Limit | Max Limit
DRNAREA | Drainage Area | 10.3 | square miles | 4.78 | 1150
BSLOPD | Mean Basin Slope degrees | 1.7175 | degrees | 1.7 | 6.4
ROCKDEP | Depth to Rock | 4.6 | feet | 4.13 | 5.21
URBAN | Percent Urban | 7.059 | percent | 0 | 89
Low-Flow Statistics Flow Report [Low Flow Region 1]
PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)
Statistic | Value | Unit | SE | ASEp
7 Day 2 Year Low Flow | 0.579 | ft^3/s | 46 | 46
30 Day 2 Year Low Flow | 0.952 | ft^3/s | 38 | 38
7 Day 10 Year Low Flow | 0.189 | ft^3/s | 51 | 51
30 Day 10 Year Low Flow | 0.324 | ft^3/s | 46 | 46
90 Day 10 Year Low Flow | 0.827 | ft^3/s | 41 | 41


USGS StreamStats
SELECT A STATE / REGION
Pennsylvania
IDENTIFY A STUDY AREA
Basin Delineated
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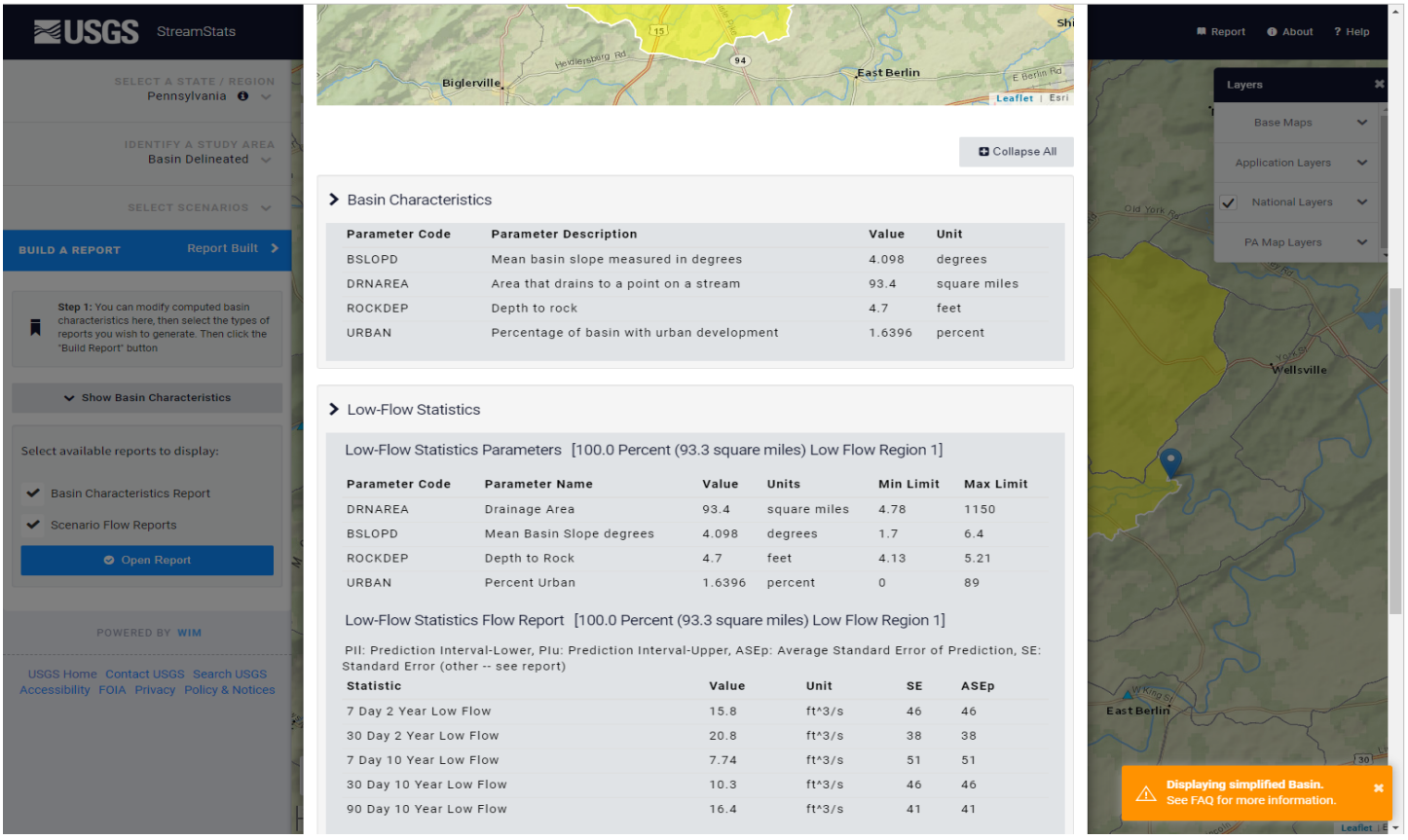
Application Layers
National Layers
PA Map Layers
Collapse All
Basin Characteristics
Parameter Code | Parameter Description | Value | Unit
BSLOPD | Mean basin slope measured in degrees | 1.7789 | degrees
DRNAREA | Area that drains to a point on a stream | 10.8 | square miles
ROCKDEP | Depth to rock | 4.6 | feet
URBAN | Percentage of basin with urban development | 6.7497 | percent
Low-Flow Statistics
Low-Flow Statistics Parameters [Low Flow Region 1]
Parameter Code | Parameter Name | Value | Units | Min Limit | Max Limit
DRNAREA | Drainage Area | 10.8 | square miles | 4.78 | 1150
BSLOPD | Mean Basin Slope degrees | 1.7789 | degrees | 1.7 | 6.4
ROCKDEP | Depth to Rock | 4.6 | feet | 4.13 | 5.21
URBAN | Percent Urban | 6.7497 | percent | 0 | 89
Low-Flow Statistics Flow Report [Low Flow Region 1]
PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)
Statistic | Value | Unit | SE | ASEp
7 Day 2 Year Low Flow | 0.631 | ft^3/s | 46 | 46
30 Day 2 Year Low Flow | 1.03 | ft^3/s | 38 | 38
7 Day 10 Year Low Flow | 0.209 | ft^3/s | 51 | 51
30 Day 10 Year Low Flow | 0.355 | ft^3/s | 46 | 46
90 Day 10 Year Low Flow | 0.89 | ft^3/s | 41 | 41


USGS StreamStats
SELECT A STATE / REGION
Pennsylvania
IDENTIFY A STUDY AREA
Basin Delineated
SELECT SCENARIOS
BUILD A REPORT
Report Built
Step 1: You can modify computed basin characteristics here, then select the types of reports you wish to generate. Then click the "Build Report" button
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Select available reports to display:
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Open Report
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Biglerville
East Berlin
Leaflet | Esri
Collapse All
Basin Characteristics
Parameter Code | Parameter Description | Value | Unit
BSLOPD | Mean basin slope measured in degrees | 4.098 | degrees
DRNAREA | Area that drains to a point on a stream | 93.4 | square miles
ROCKDEP | Depth to rock | 4.7 | feet
URBAN | Percentage of basin with urban development | 1.6396 | percent
Low-Flow Statistics
Low-Flow Statistics Parameters [100.0 Percent (93.3 square miles) Low Flow Region 1]
Parameter Code | Parameter Name | Value | Units | Min Limit | Max Limit
DRNAREA | Drainage Area | 93.4 | square miles | 4.78 | 1150
BSLOPD | Mean Basin Slope degrees | 4.098 | degrees | 1.7 | 6.4
ROCKDEP | Depth to Rock | 4.7 | feet | 4.13 | 5.21
URBAN | Percent Urban | 1.6396 | percent | 0 | 89
Low-Flow Statistics Flow Report [100.0 Percent (93.3 square miles) Low Flow Region 1]
PII: Prediction Interval-Lower, Plu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)
Statistic | Value | Unit | SE | ASEp
7 Day 2 Year Low Flow | 15.8 | ft^3/s | 46 | 46
30 Day 2 Year Low Flow | 20.8 | ft^3/s | 38 | 38
7 Day 10 Year Low Flow | 7.74 | ft^3/s | 51 | 51
30 Day 10 Year Low Flow | 10.3 | ft^3/s | 46 | 46
90 Day 10 Year Low Flow | 16.4 | ft^3/s | 41 | 41
Report
About
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Layers
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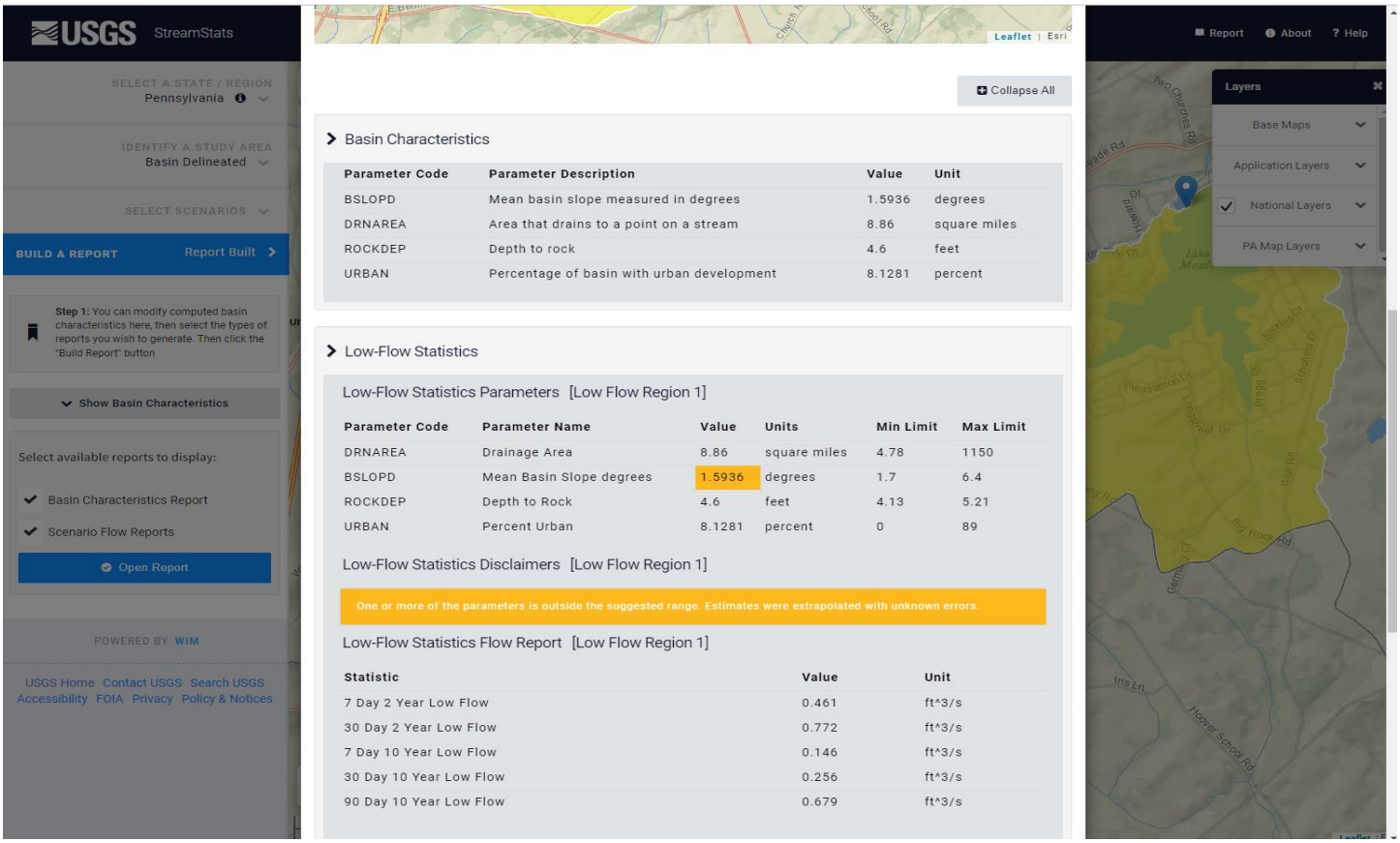
Application Layers
National Layers
PA Map Layers
Wellsville
East Berlin
Displaying simplified Basin.
See FAQ for more information.


USGS StreamStats
SELECT A STATE / REGION
Pennsylvania
IDENTIFY A STUDY AREA
Basin Delineated
SELECT SCENARIOS
BUILD A REPORT
Report Built
Step 1: You can modify computed basin characteristics here, then select the types of reports you wish to generate. Then click the "Build Report" button
Show Basin Characteristics
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Leaflet | Esri
Collapse All
Basin Characteristics
Parameter Code | Parameter Description | Value | Unit
BSLOPD | Mean basin slope measured in degrees | 1.5936 | degrees
DRNAREA | Area that drains to a point on a stream | 8.86 | square miles
ROCKDEP | Depth to rock | 4.6 | feet
URBAN | Percentage of basin with urban development | 8.1281 | percent
Low-Flow Statistics
Low-Flow Statistics Parameters [Low Flow Region 1]
Parameter Code | Parameter Name | Value | Units | Min Limit | Max Limit
DRNAREA | Drainage Area | 8.86 | square miles | 4.78 | 1150
BSLOPD | Mean Basin Slope degrees | 1.5936 | degrees | 1.7 | 6.4
ROCKDEP | Depth to Rock | 4.6 | feet | 4.13 | 5.21
URBAN | Percent Urban | 8.1281 | percent | 0 | 89
Low-Flow Statistics Disclaimers [Low Flow Region 1]
One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.
Low-Flow Statistics Flow Report [Low Flow Region 1]
Statistic | Value | Unit
7 Day 2 Year Low Flow | 0.461 | ft^3/s
30 Day 2 Year Low Flow | 0.772 | ft^3/s
7 Day 10 Year Low Flow | 0.146 | ft^3/s
30 Day 10 Year Low Flow | 0.256 | ft^3/s
90 Day 10 Year Low Flow | 0.679 | ft^3/s
Report
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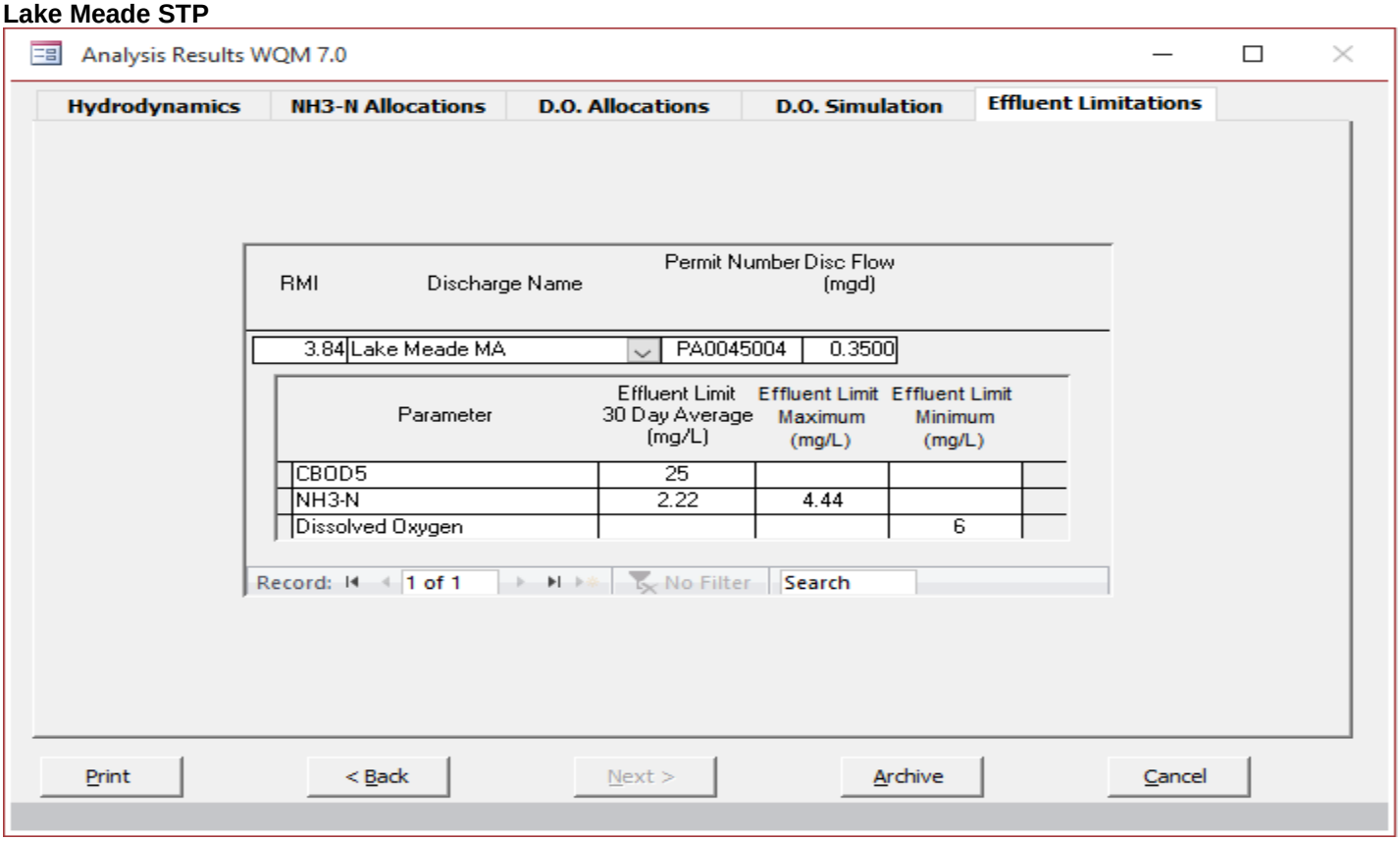
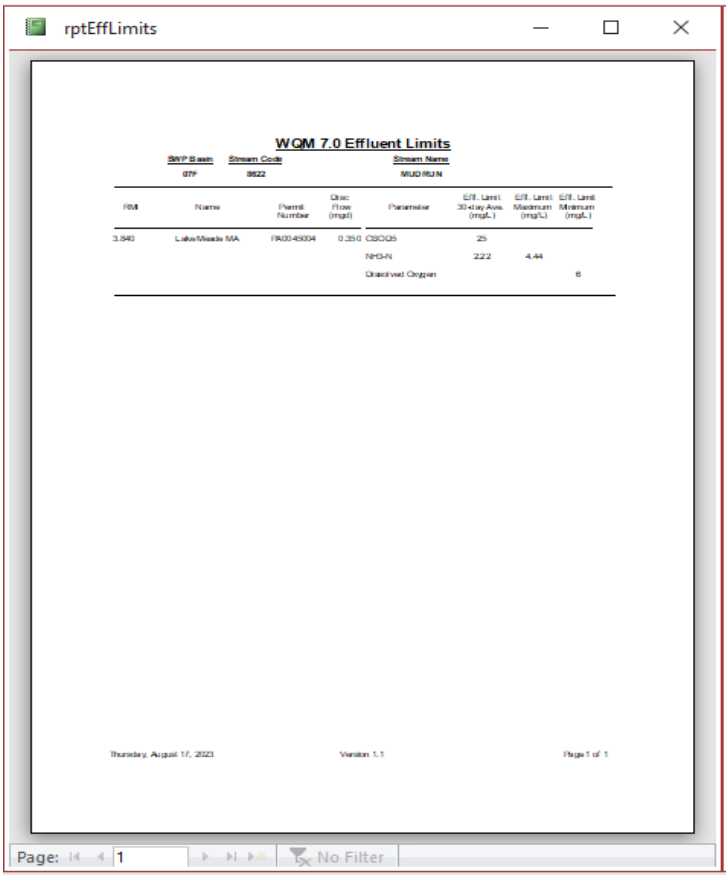
National Layers
PA Map Layers


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)
3.84
Lake Meade MA
PA0045004
0.3500
Parameter
Effluent Limit 30 Day Average (mg/L)
Effluent Limit Maximum (mg/L)
Effluent Limit Minimum (mg/L)
CBOD5
25
NH3-N
2.22
4.44
Dissolved Oxygen
6
Record: 1 of 1
No Filter
Search
Print
< Back
Next >
Archive
Cancel


rptEffLimits
WQM 7.0 Effluent Limits
SWP Basin
Stream Code
Stream Name
07F
8622
MUD RUN
RMI
Name
Permit Number
Disc Flow (mgd)
Parameter
Eff. Limit 30-day Ave. (mg/L)
Eff. Limit Maximum (mg/L)
Eff. Limit Minimum (mg/L)
3.840
Lake Meade MA
PA0045004
0.350
CBOD5
25
NH3-N
2.22
4.44
Dissolved Oxygen
6
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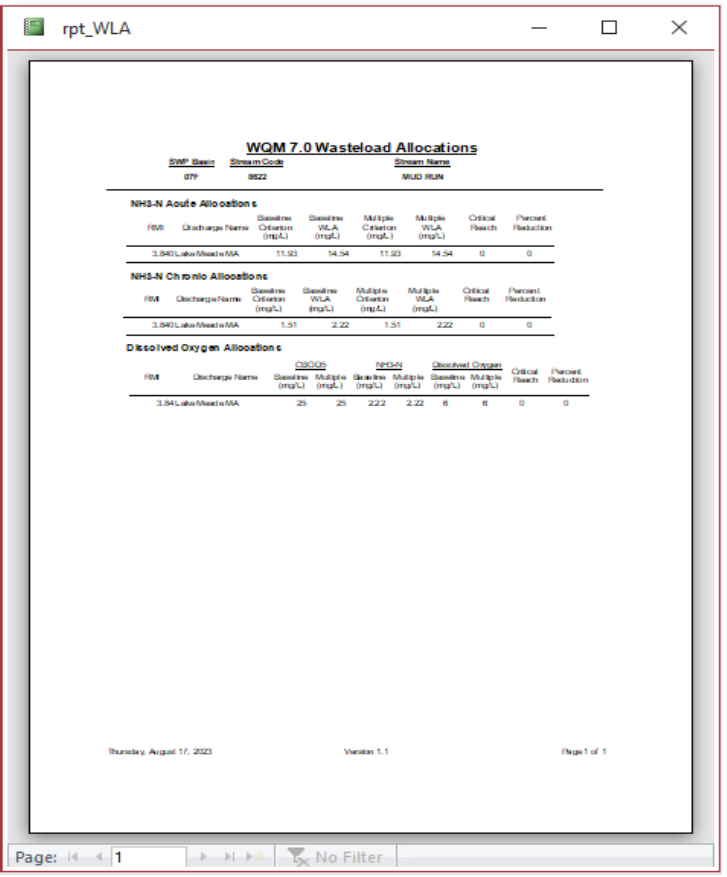
rpt_WLA
WQM 7.0 Wasteload Allocations
SWP Basin
Stream Code
Stream Name
07F
8622
MUD RUN
NH3-N Acute Allocations
RMI
Discharge Name
Baseline Criterion (mg/L)
Baseline WLA (mg/L)
Multiple Criterion (mg/L)
Multiple WLA (mg/L)
Critical Reach
Percent Reduction
3.840
Lake Meade MA
11.93
14.54
11.93
14.54
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
3.840
Lake Meade MA
1.51
2.22
1.51
2.22
0
0
Dissolved Oxygen Allocations
CBOD5
NH3-N
Dissolved Oxygen
RMI
Discharge Name
Baseline (mg/L)
Multiple (mg/L)
Baseline (mg/L)
Multiple (mg/L)
Baseline (mg/L)
Multiple (mg/L)
Critical Reach
Percent Reduction
3.84
Lake Meade MA
25
25
2.22
2.22
6
6
0
0
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rptDOSim

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
07F	8622	MUD RUN

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
3.840	0.350	23.725	7.000

Reach Width (ft)	Reach Depth (ft)	Reach WD Ratio	Reach Velocity (fps)
13.888	0.492	27.209	0.105

Reach CBOD5 (mg/L)	Reach Kr (1/days)	Reach NH3-N (mg/L)	Reach Kn (1/days)
1.913	1.492	1.85	0.932

Reach DO (mg/L)	Reach Kr Equation	Reach DO Goal (mg/L)
8.372	Owens	6

Reach Travel Time (days)
0.209

Subreach Results

Travel time (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.021	18.46	1.82	6.30
0.042	17.80	1.59	6.15
0.063	17.17	1.56	6.08
0.084	16.56	1.53	6.07
0.105	15.98	1.50	6.09
0.126	15.41	1.47	6.13
0.147	14.86	1.44	6.18
0.167	14.34	1.41	6.24
0.188	13.83	1.39	6.30
0.209	13.34	1.36	6.37

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rptModelSpecs

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	1.36	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	6		

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rptHydro

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
07F	8622	MUD RUN

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Dis 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												
3.840	0.19	0.00	0.19	.5414	0.00887	.492	13.89	27.84	0.11	0.209	23.72	7.00
Q1-10 Flow												
3.840	0.12	0.00	0.12	.5414	0.00887	NA	NA	NA	0.10	0.221	24.10	7.00
Q30-10 Flow												
3.840	0.25	0.00	0.25	.5414	0.00887	NA	NA	NA	0.11	0.199	23.41	7.00

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rptGeneral

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sqmi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
07F	8622	MUD RUN	3.840	483.65	10.30	0.000000	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	0.018	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
Lake Meade MA	PA0045004	0.3500	0.3500	0.3500	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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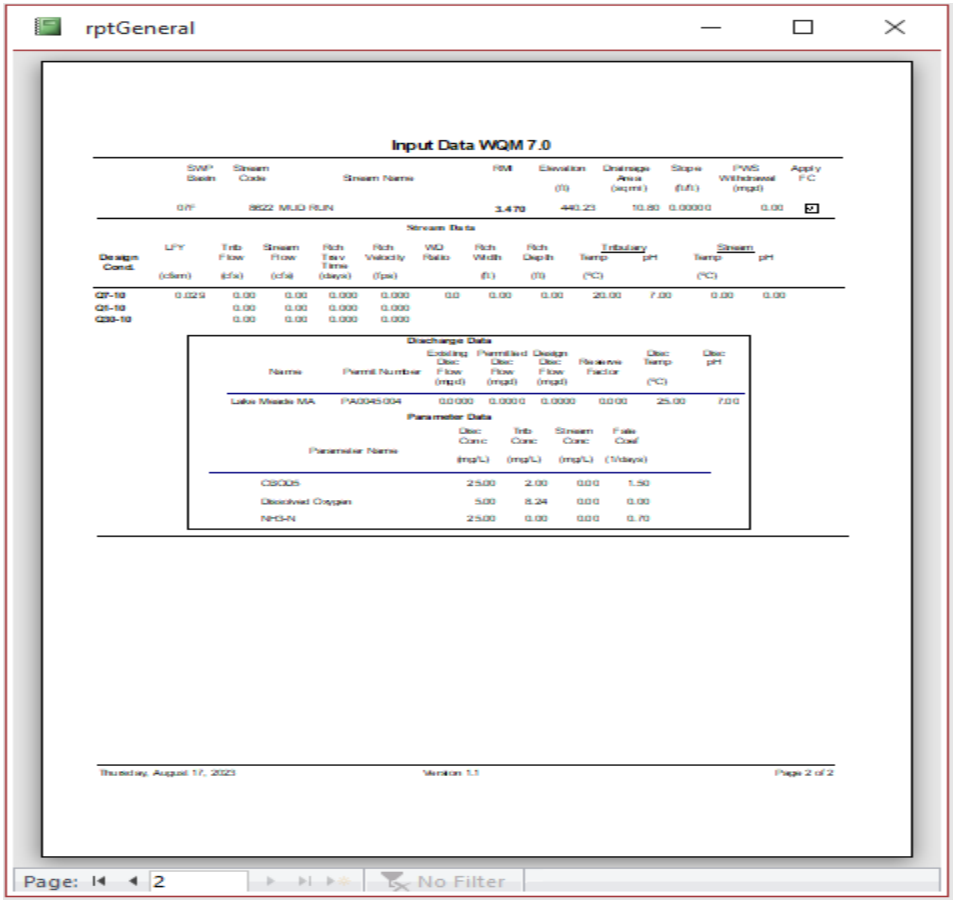

Toxics Data:
The following input data were used for Toxic Management Spreadsheet (TMS) Analysis:

* Discharge pH = 7.0 (Application)
* Stream pH = 7.0 (Default)
* Discharge Hardness = 232.0 mg/L (media 4/11 & 4/18/2018)
* Stream Hardness = 100 mg/L (Default)

Node 1: Outfall 001 at Mud Run (08622)
Elevation: 453.65 ft (USGS National Map)
Drainage Area: 10.3 mi^2 (USGS StreamStats)
River Mile Index: 3.84 (PA DEP eMapPA)
Low Flow Yield: 0.018 cfs/mi^2 (calculated, see below)
Discharge Flow: 0.35 MGD

Node 2: At the confluence UNT to 08626
Elevation: 440.23 ft (USGS National Map)
Drainage Area: 10.8 mi^2 (USGS StreamStats)
River Mile Index: 3.47 (PA DEP eMapPA)
Low Flow Yield: 0.029 cfs/mi^2 (calculated, see below)
Discharge Flow: 0.00 MGD

LFY at discharge point: 0.189 cfs/10.3 mi^2 = 0.018 cfs/mi^2
Q_{7-10} at node 2 = 0.158 cfs + 0.075*(10.8 – 8.86) = 0.31 cfs
LFY at node 2 = 0.31 cfs/10.8 mi^2 = 0.029 cfs/mi^2

Note: Based on the previous factsheet dated 6/7/2018, DEP indicated the stream hardness, pH, and discharge hardness as the Table below.

Date	Total Lead, µg/l	Stream Hardness, (mg/l)	Stream pH	Discharge Hardness (mg/l)
4/11/18	<5	88	8.7	227
4/18/18	<5	78		237
4/25/18	<5	77	8.7	

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Toxics Management Spreadsheet
Version 1.4, May 2023

Discharge Information

Instructions | Discharge | Stream

Facility: Lake Meade Municipal Authority NPDES Permit No.: PA0045004 Outfall No.: 001

Evaluation Type: Custom / Additives Wastewater Description: Mud Run

Discharge Characteristics								
Design Flow (MGD)*	Hardness (mg/l)*	pH (SU)*	Partial Mix Factors (PMFs)				Complete Mix Times (min)	
			AFC	CFC	THH	CRL	Q_{7-10}	Q_h
0.35	232	7						

Discharge Pollutant	Units	Max Discharge Conc		0 if left blank: Trib Conc	0 if left blank: Stream Conc	0.5 if left blank: Daily CV	0.5 if left blank: Hourly CV	0 if left blank: Strea m CV	0 if left blank: Fate Coeff	0 if left blank: FOS	1 if left blank: Criteri a Mod	1 if left blank: Chem Transl
Total Copper	mg/L		0.032									
Total Lead	mg/L	<	0.001									
Total Zinc	mg/L		0.038									

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Toxics Management Spreadsheet
Version 1.4, May 2023

Stream / Surface Water Information

Lake Meade Municipal Authority, NPDES Permit No. PA0045004, Outfall 001

Instructions | Discharge | Stream

Receiving Surface Water Name: Mud Run No. Reaches to Model: 1

- (●) Statewide Criteria
- ( ) Great Lakes Criteria
- ( ) ORSANCO Criteria

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi^2)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	008622	3.84	453.65	10.3			Yes
End of Reach 1	008622	3.47	440.23	10.8			Yes

Q_{7-10}

Location	RMI	LFY (cfs/mi^2)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	3.84	0.018										100	7		
End of Reach 1	3.47	0.029													

Q_h

Location	RMI	LFY (cfs/mi^2)	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	3.84														
End of Reach 1	3.47														

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DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.4, May 2023

Model Results

Lake Meade Municipal Authority, NPDES Permit No. PA0045004, Outfall 001

Instructions | Results | RETURN TO INPUTS | SAVE AS PDF | PRINT | ◉ All ○ Inputs ○ Results ○ Limits

☐ ***Hydrodynamics***

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 0.585 PMF: 1 Analysis Hardness (mg/l): 198.33 Analysis pH: 7.00

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Copper	0	0		0	25.620	26.7	35.8	Chem Translator of 0.96 applied
Total Lead	0	0		0	134.935	195	262	Chem Translator of 0.691 applied
Total Zinc	0	0		0	209.331	214	287	Chem Translator of 0.978 applied

☑ ***CFC*** CCT (min): 0.585 PMF: 1 Analysis Hardness (mg/l): 198.33 Analysis pH: 7.00

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Copper	0	0		0	16.078	16.7	22.5	Chem Translator of 0.96 applied
Total Lead	0	0		0	5.258	7.61	10.2	Chem Translator of 0.691 applied
Total Zinc	0	0		0	211.043	214	287	Chem Translator of 0.986 applied

☑ ***THH*** CCT (min): 0.585 PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Copper	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	

☑ ***CRL*** CCT (min): 2.458 PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Copper	0	0		0	N/A	N/A	N/A	

Total Lead	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	

☑ ***Recommended WQBELs & Monitoring Requirements***

No. Samples/Month: 4

	Mass Limits		*Concentration Limits*						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments
Total Copper	0.066	0.1	0.022	0.035	0.056	mg/L	0.022	CFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Zinc	Report	Report	Report	Report	Report	mg/L	0.21	AFC	Discharge Conc > 10% WQBEL (no RP)

☑ ***Other Pollutants without Limits or Monitoring***

The following pollutants do not require effluent limits or monitoring based on water quality because reasonable potential to exceed water quality criteria was not determined and the discharge concentration was less than thresholds for monitoring, or the pollutant was not detected and a sufficiently sensitive analytical method was used (e.g., <= Target QL).

Pollutants	Governing WQBEL	Units	Comments
Total Lead	N/A	N/A	Discharge Conc < TQL

Dam calculation from the previous review factsheet dated 6/7/2018 is as screen prints below.

1 cfs = 646190.44 gpd; 102034 gpd x 1 cfs / 646190.44 gpd = 0.1579 cfs

Lake Meade Property Owner's Association (PA DEP ID NO. D01 - 81)
Low Flow Release Calculator

Measurement Taken By: Terry Leiby
Measurements Taken On: 1/17/2017

Data Input

Diameter of pipe =	23.00	inches, or	1.9167	feet	
Slope of pipe =	0.0174	feet / foot			
Manning's "n" value =	0.012				
Depth of flow =	1.2830	inches, or	0.1069	feet	(input variable)

(maximum value = 1/2 of pipe diameter, if greater than 1/2 pipe diameter contact Engineer)

Calculation Results

Cross Sectional Area of Flow =	0.0634	square feet			
Central Angle =	54.65	degrees, or	0.9537	radians	
Wetted Perimeter =	1.0713	feet			
Hydraulic Radius =	0.0592	feet			
Flowrate =	0.1579	cubic feet per second (CFS)			
OR	**102,034**	**gallons per day (GPD)**			

Common Fraction - Decimal Conversions

1/8	=	*0.125*
1/4	=	*0.250*
3/8	=	*0.375*
1/2	=	*0.500*
5/8	=	*0.625*
3/4	=	*0.750*
7/8	=	*0.875*

Example: 1 - 5/8 inches is the same as 1.625 inches

Lake Meade Property Owner's Association (PA DEP ID NO. D01 - 81)
Low Flow Release Calculator

Measurement Taken By: Terry Leiby
Measurements Taken On: 4/3/2017

Data Input

Diameter of pipe =	23.00	inches, or	1.9167	feet	
Slope of pipe =	0.0174	feet / foot			
Manning's "n" value =	0.012				
Depth of flow =	1.2830	inches, or	0.1069	feet	(input variable)

(maximum value = 1/2 of pipe diameter, if greater than 1/2 pipe diameter contact Engineer)

Calculation Results

Cross Sectional Area of Flow =	0.0634	square feet			
Central Angle =	54.65	degrees, or	0.9537	radians	
Wetted Perimeter =	1.0713	feet			
Hydraulic Radius =	0.0592	feet			
Flowrate =	0.1579	cubic feet per second (CFS)			
OR	**102,034**	**gallons per day (GPD)**			

Common Fraction - Decimal Conversions

1/8	=	*0.125*
1/4	=	*0.250*
3/8	=	*0.375*
1/2	=	*0.500*
5/8	=	*0.625*
3/4	=	*0.750*
7/8	=	*0.875*

Example: 1 - 5/8 inches is the same as 1.625 inches

Lake Meade Property Owner's Association (PA DEP ID NO. D01 - 81)
Low Flow Release Calculator

Measurement Taken By: Terry Leiby and Keith Lentz
Meaurements Taken On: 8/3/2017

Data Input

Diameter of pipe =	23.00	inches, or	1.9167	feet	
Slope of pipe =	0.0174	feet / foot			
Manning's "n" value =	0.012				
Depth of flow =	1.2830	inches, or	0.1069	feet	(input variable)

(maximum value = 1/2 of pipe diameter, if greater than 1/2 pipe diameter contact Engineer)

Calculation Results

Cross Sectional Area of Flow =	0.0634	square feet	
Central Angle =	54.65	degrees, or	0.9537 radians
Wetted Perimeter =	1.0713	feet	
Hydraulic Radius =	0.0592	feet	
Flowrate =	0.1579	cubic feet per second (CFS)	
OR	**102,034**	**gallons per day (GPD)**	

Common Fraction - Decimal Conversions

1/8	=	*0.125*
1/4	=	*0.250*
3/8	=	*0.375*
1/2	=	*0.500*
5/8	=	*0.625*
3/4	=	*0.750*
7/8	=	*0.875*

Example: 1 - 5/8 inches is the same as 1.625 inches

Lake Meade Property Owner's Association (PA DEP ID NO. D01 - 81)
Low Flow Release Calculator

Measurement Taken By: Terry Leiby and Keith Lentz
Meaurements Taken On: 10/6/2017

Data Input

Diameter of pipe =	23.00	inches, or	1.9167	feet	
Slope of pipe =	0.0174	feet / foot			
Manning's "n" value =	0.012				
Depth of flow =	1.2830	inches, or	0.1069	feet	(input variable)

(maximum value = 1/2 of pipe diameter, if greater than 1/2 pipe diameter contact Engineer)

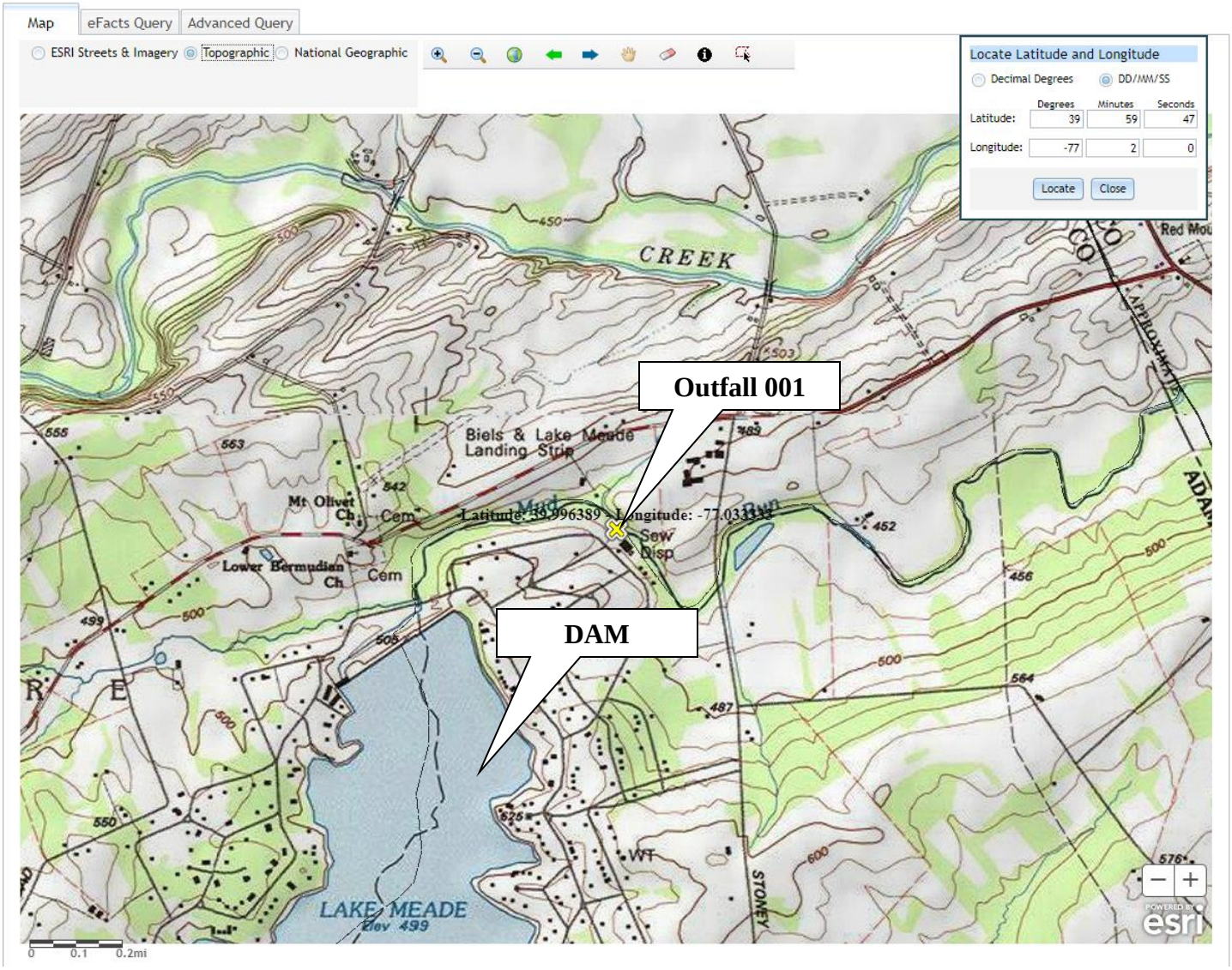
Calculation Results

Cross Sectional Area of Flow =	0.0634	square feet	
Central Angle =	54.65	degrees, or	0.9537 radians
Wetted Perimeter =	1.0713	feet	
Hydraulic Radius =	0.0592	feet	
Flowrate =	0.1579	cubic feet per second (CFS)	
OR	**102,034**	**gallons per day (GPD)**	

Common Fraction - Decimal Conversions

1/8	=	*0.125*
1/4	=	*0.250*
3/8	=	*0.375*
1/2	=	*0.500*
5/8	=	*0.625*
3/4	=	*0.750*
7/8	=	*0.875*

Example: 1 - 5/8 inches is the same as 1.625 inches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Longitude:
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Locate
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Outfall 001
DAM
Latitude: 39.996389 Longitude: -77.033333
CREEK
Biels & Lake Meade Landing Strip
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Existing Effluent Limitations and Monitoring Requirements

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Daily Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	9.0 Daily Max	XXX	1/day	Grab
Dissolved Oxygen	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	29.0	43.0	XXX	10.0	15.0	20	1/week	24-Hr Composite
Biochemical Oxygen Demand (BOD5) Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Total Suspended Solids	29.0	43.0	XXX	10.0	15.0	20	1/week	24-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	1/week	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/week	Grab
Ultraviolet light intensity (mW/cm²)	XXX	XXX	Report	XXX	XXX	XXX	1/day	Recorded
Ammonia-Nitrogen Nov 1 - Apr 30	13.0	XXX	XXX	4.5	XXX	9	1/week	24-Hr Composite
Ammonia-Nitrogen May 1 - Oct 31	4.3	XXX	XXX	1.5	XXX	3	1/week	24-Hr Composite
Total Phosphorus	5.8	XXX	XXX	2.0	XXX	4	1/week	24-Hr Composite
Copper, Total Interim	Report	XXX	XXX	Report	XXX	Report Daily Max	1/week	24-Hr Composite
Copper, Total Final	0.07	XXX	XXX	0.024	XXX	0.04 Daily Max	1/week	24-Hr Composite

Existing Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, to comply with Pennsylvania's Chesapeake Bay Tributary Strategy.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Monthly	Annual	Monthly	Monthly Average	Maximum	Instant. Maximum		
Ammonia--N	Report	Report	XXX	Report	XXX	XXX	1/month	24-Hr Composite
Kjeldahl--N	Report	XXX	XXX	Report	XXX	XXX	1/month	24-Hr Composite
Nitrate-Nitrite as N	Report	XXX	XXX	Report	XXX	XXX	1/month	24-Hr Composite
Total Nitrogen	Report	Report	XXX	Report	XXX	XXX	1/month	Calculation
Total Phosphorus	Report	Report	XXX	Report	XXX	XXX	1/month	24-Hr 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" (386-0400-001), SOPs and/or BPJ.

Outfall 001, Effective Period: Permit Effective Date through Permit Expiration Date.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	9.0 Daily Max	XXX	1/day	Grab
DO	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
UV Intensity (mW/cm²)	XXX	XXX	Report	XXX	XXX	XXX	1/day	Recorded
CBOD5	29.0	43.0	XXX	10.0	15.0	20.0	1/week	24-Hr Composite
BOD5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	24-Hr Composite
TSS	29.0	43.0	XXX	10.0	15.0	20.0	1/week	24-Hr Composite
TSS Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	1/week	Grab
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2,000 Geo Mean	XXX	10,000	1/week	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/quarter	Grab
Ammonia May 1 - Oct 31	4.3	XXX	XXX	1.5	XXX	3	1/week	24-Hr Composite
Ammonia Nov 1 - Apr 30	13.0	XXX	XXX	4.5	XXX	9	1/week	24-Hr Composite
Total Phosphorus	5.8	XXX	XXX	2.0	XXX	4	1/week	24-Hr Composite
Total Copper	0.06	XXX	XXX	0.022	0.035 Daily Max	XXX	1/week	24-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" (386-0400-001), 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	1/month	24-Hr Composite
Kjeldahl--N	Report	XXX	XXX	Report	XXX	XXX	1/month	24-Hr Composite
Nitrate-Nitrite as N	Report	XXX	XXX	Report	XXX	XXX	1/month	24-Hr Composite
Total Nitrogen	Report	Report	XXX	Report	XXX	XXX	1/month	Calculation
Total Phosphorus	Report	Report	XXX	Report	XXX	XXX	1/month	24-Hr 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, 386-0400-001, 10/97.
☐	Policy for Permitting Surface Water Diversions, 386-2000-019, 3/98.
☐	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 386-2000-018, 11/96.
☐	Technology-Based Control Requirements for Water Treatment Plant Wastes, 386-2183-001, 10/97.
☐	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 386-2183-002, 12/97.
☐	Pennsylvania CSO Policy, 386-2000-002, 9/08.
☐	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
☐	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 386-2000-008, 4/97.
☐	Determining Water Quality-Based Effluent Limits, 386-2000-004, 12/97.
☐	Implementation Guidance Design Conditions, 386-2000-007, 9/97.
☒	Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 386-2000-016, 6/2004.
☐	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 386-2000-012, 10/1997.
☒	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 386-2000-009, 3/99.
☒	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 386-2000-015, 5/2004.
☐	Implementation Guidance for Section 93.7 Ammonia Criteria, 386-2000-022, 11/97.
☐	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 386-2000-013, 4/2008.
☐	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 386-2000-011, 11/1994.
☐	Implementation Guidance for Temperature Criteria, 386-2000-001, 4/09.
☐	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 386-2000-021, 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, 386-2000-020, 10/97.
☐	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 386-2000-005, 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, 386-2000-010, 3/1999.
☐	Design Stream Flows, 386-2000-003, 9/98.
☐	Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 386-2000-006, 10/98.
☐	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 386-3200-001, 6/97.
☒	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
☒	SOP: BCW-PMT-033
☐	Other: