Pennsylvania Department of Environmental Protection

Southcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0084514**
Facility Type	**Municipal**	APS ID	**3678**
Major / Minor	**Minor**	Authorization ID	**1502769**

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Shade Gap Area Joint Municipal Authority Huntingdon County**	Facility Name	**Shade Gap STP**
Applicant Address	PO Box 185 Shade Gap, PA 17255-0185	Facility Address	22136 Croghan Pike Shade Gap, PA 17255-0185
Applicant Contact	Rory Myers	Facility Contact	David Hockenberry
Applicant Phone	(814) 259-3287	Facility Phone	(814) 259-3892
Client ID	64599	Site ID	449751
Ch 94 Load Status	Not Overloaded	Municipality	Shade Gap Borough
Connection Status	No Limitations	County	Huntingdon
Date Application Received	October 11, 2024	EPA Waived?	Yes
Date Application Accepted	October 16, 2024	If No, Reason	

Purpose of Application: NPDES permit renewal.

Summary of Review

Stiffler, McGraw & Associates, Inc., on behalf of the Shade Gap Area Joint Municipal Authority (SGAJMA) (Authority/Permittee), applied to the Pennsylvania Department of Environmental Protection (DEP) for issuance of the NPDES permit. The permit was reissued on June 5, 2020, and became effective on July 1, 2020. The permit expires on June 30, 2025.

Shade Gap Area Joint Municipal Authority owns, operates, and maintains the wastewater treatment plant located in Shade Gap Borough, Dublin Township, Huntingdon County. The aeration secondary treatment plant discharges treated municipal wastewater to Shade Creek, which is classified for Trout Stocking Fishes (TSF).

The average annual design flow is 0.065 MGD, and the organic loading capacity is 135 lbs BOD_5/day. The hydraulic design capacity is 0.163 MGD. The renewal application indicated the STP receives its 70% from the Dublin Township & 30% from Shade Gap Borough.

WQM Part II No. 3192406 original was issued on November 25, 1992.

Sludge use and disposal description and location(s): N/A because sludge is hauled by facility's contractor.

Changes from the previous permit: E. Coli monitoring and report requirements will add to the proposed permit.

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	March 28, 2025
X		*Maria D. Bebenek for* Daniel W. Martin, P.E. / Environmental Engineer Manager	May 22, 2025

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	001	Design Flow (MGD)	0.065
Latitude	40º 11' 9.34"	Longitude	-77º 51' 46.30"
Quad Name	Shade Gap	Quad Code	
Wastewater Description:	Sewage Effluent		
Receiving Waters	Shade Creek (TSF)	Stream Code	12806
NHD Com ID	66211959	RMI	4.6 miles
Drainage Area	19.6 mi.^{2}	Yield (cfs/mi^2)	See comments below
Q_{7-10} Flow (cfs)	See comments below	Q_{7-10} Basis	USGS StreamStats
Elevation (ft)	880.0	Slope (ft/ft)	
Watershed No.	12-C	Chapter 93 Class.	TSF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment			
Source(s) of Impairment			
TMDL Status		Name	
Nearest Downstream Public Water Supply Intake	Mifflintown Borough Municipal Authority, Juniata County		
PWS Waters	Juniata River	Flow at Intake (cfs)	
PWS RMI	34.4 miles	Distance from Outfall (mi)	

Changes Since Last Permit Issuance:

Drainage Area
The discharge is to Toms Creek at RMI 4.6 miles. A drainage area upstream of the discharge is estimated to be 19.6 mi.^{2}, according to USGS PA StreamStats available at https://streamstats.usgs.gov/ss/.

Stream Flow
There is no gage station on Shade Creek to accurately determine Q_{7-10} flow. Therefore, Streamflow will be correlated with past streamflow records taken from the nearby USGS gage station No. 01559500 on the Standing Stone Creek, Huntingdon county. The Q_{7-10} is 6.7 cfs and the drainage area is 129 mi.^{2} (according to USGS PA StreamStats available at https://streamstats.usgs.gov/ss/) which results in a Q_{7-10} low flow yield of 0.05 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):

Low Flow Yield = 6.7 cfs / 129 mi.^{2} ≈ 0.05 cfs/mi.^{2}
Q_{7-10} discharge = 0.05 cfs/mi.^{2} x D.A discharge = 0.05 cfs/mi.^{2} x 19.6 mi.^{2} = 1.0 cfs
Q_{30-10} = 1.36 * 1.0 cfs ≈ 1.36 cfs
Q_{1-10} = 0.64 * 1.0 cfs ≈ 0.64 cfs

The resulting dilution ratio (under Q_{7-10} conditions) is: Q_{stream} / $Q_{discharge}$ = 1.00 cfs / [0.065 MGD * (1.55 cfs/MGD)] = 9.9:1

Shade Creek
25 Pa Code 93.9n classifies Shade Creek as Trout Stocking Fishes (TSF) surface water. Based on the 2024 Integrated Report, Shade Creek, is not impaired. A TMDL currently does not exist for this stream segment, therefore, no TMDL has been taken into consideration during this review.

Public Water Supply
The closest water supply intake located downstream from the discharge is the Mifflintown Borough Municipal Authority on Juniata River located approximately 64 miles downstream. Due to dilution, this discharge is not expected to have any impact on the intake.

Treatment Facility Summary				
Treatment Facility Name: Shade Gap Area STP				
WQM Permit No.	**Issuance Date**			
3192406	11/25/1992			
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Secondary	Extended Aeration	Hypochlorite	0.065
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.065	135	Not Overloaded	Drying	Combination of methods

Changes Since Last Permit Issuance:

Other Comments:
The treatment plant consists of:

A wet well/comminutor/bar screen, equalization tank, 2 aeration tanks, 2 settling tanks, 2 chlorine contact tanks, post aeration, sludge digester, 3 reed beds, 3 blowers, and discharge (outfall 001).

Chemical use:
Sodium Hypochlorite (12.5%) is for disinfectant.

Biosolids Management:
The total sewage sludge/biosolids production within the facility for the previous year was 6.79 dry tons.

Industrial/Commercial Users:
There are industrial/commercial users contributing to this treatment plant, see table below.

Customer	Type	Hauled in Waste	Billed EDUs	Estimated Flow (GPD)
Gap Mini Mart Office	Commercial	No	1	102
Shade Gap Garage	Commercial	No	1	102
Gap Pitt Stop	Commercial	No	2	204
A Custom Harness	Commercial	No	1	102
Brightspeed	Commercial	No	1	102
SHC School	Commercial	No	24	2448
Cisney's Auto Parts	Commercial	No	1	102
Dublin Township	Commercial	No	1	102
Valley Rural Electric	Commercial	No	3	306
Shade Gap Fire Co	Commercial	No	1	102
Danzer (only Sanitary waste is accepted)	Industrial	Yes	6	612
Woodmizer	Commercial	No	1	102
Shade Valley UM	Commercial	No	1	102
Shade Gap Post Office	Commercial	No	1	102
Dollar General	Commercial	No	1	102
Ladies Auxilary	Commercial	No	1	102
Revercomb	Commercial	No	2	204

Compliance History	
Summary of DMRs:	DMR Data 12 months are summarized in the next page.
Summary of Inspections:	1/5/2024: Mr. Clark, DEP WQS, conducted a compliance evaluation inspection. There were no violations noted during inspection. Recommend recording all maintenance and repair work in the logbook including recent upgrade to pump station and repair of EQ pump. 2/7/2023: Mr. Clark, DEP WQS, conducted a partial inspection. There were no violations noted during inspection. Recommendations were used a remote camera to check the condition of the sewer line and repair as necessary and assure second pump in pump station is operable. 4/27/2022: Mr. Clark, DEP WQS, conducted a compliance evaluation inspection. There were no violations noted during inspection. Effluent was clear with a light brown tint. Field tests results were within permitted limits.
Other Comments:	There were no open violations against facility or permittee.

Other Comments:

Compliance History

DMR Data for Outfall 001 (from February 1, 2024 to January 31, 2025)

Parameter	JAN-25	DEC-24	NOV-24	OCT-24	SEP-24	AUG-24	JUL-24	JUN-24	MAY-24	APR-24	MAR-24	FEB-24
Flow (MGD) Average Monthly	0.0144	0.0191	0.0139	0.0113	0.0123	0.0163	0.0107	0.0105	0.021	0.0305	0.0222	0.0203
Flow (MGD) Daily Maximum	0.0277	0.0548	0.0360	0.0217	0.0223	0.0627	0.0258	0.0230	0.0534	0.1018	0.0499	0.0370
pH (S.U.) Daily Minimum	6.7	6.7	6.9	7.1	6.9	7.1	7.0	7.1	7.1	7.1	7.0	7.0
pH (S.U.) Instantaneous Maximum	7.3	7.5	7.5	7.3	7.4	7.6	7.4	7.5	7.5	7.5	7.5	7.6
D.O. (mg/L) Daily Minimum	9.4	8.2	6.4	5.3	5.3	5.7	5.3	5.6	5.3	6.4	6.9	6.5
TRC (mg/L) Average Monthly	0.42	0.42	0.39	0.41	0.36	0.34	0.31	0.46	0.36	0.39	0.47	0.38
CBOD5 (lbs/day) Average Monthly	< 0.89	< 0.40	< 0.38	< 0.28	< 0.28	< 0.31	< 0.50	< 0.37	< 0.58	< 0.54	1.32	< 0.44
CBOD5 (lbs/day) Daily Maximum	1.40	< 0.42	< 0.38	< 0.36	< 0.30	< 0.37	0.67	< 0.38	< 0.72	0.61	1.51	0.45
CBOD5 (mg/L) Average Monthly	< 5.84	< 3.00	< 3.00	< 3.00	< 3.00	< 3.00	< 3.62	< 3.00	< 3.00	< 3.69	4.85	< 3.10
CBOD5 (mg/L) Weekly Average	8.68	< 3.00	< 3.00	< 3.00	< 3.00	< 3.00	4.23	< 3.00	< 3.00	4.38	5.65	3.19
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	28.76	33.80	29.53	20.72	30.91	24.13	35.68	34.28	47.15	39.67	57.07	50.70
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	32.20	36.88	38.16	25.03	36.12	30.20	39.25	38.67	59.83	46.10	68.90	53.20
BOD5 (mg/L) Raw Sewage Influent Average Monthly	200.0	253.5	235.5	225.0	303.50	235.70	265.0	280.5	273.5	271.5	205.50	356.5
TSS (lbs/day) Average Monthly	0.86	< 0.29	< 0.20	0.22	< 0.15	< 0.16	< 0.34	0.34	< 0.43	0.61	1.69	0.74
TSS (lbs/day) Raw Sewage Influent Average Monthly	29.21	21.63	35.15	17.41	23.42	19.23	24.05	20.33	32.87	23.26	38.37	54.50
TSS (lbs/day) Daily Maximum	0.97	0.36	< 0.20	0.24	< 0.16	< 0.20	0.50	0.43	0.48	0.72	2.10	0.74

TSS (lbs/day) Raw Sewage Influent Daily Maximum	35.77	31.01	37.78	21.04	33.40	24.00	34.31	27.14	42.75	31.48	46.43	68.17
TSS (mg/L) Average Monthly	6.00	< 2.20	< 1.60	2.40	< 1.60	< 1.60	< 2.40	2.80	< 2.40	4.20	6.00	5.20
TSS (mg/L) Raw Sewage Influent Average Monthly	212.0	158.00	280.00	189.0	220.00	190.00	168.0	167.00	192.0	161.0	138.00	383.00
TSS (mg/L) Weekly Average	6.00	2.80	< 1.60	2.80	< 1.60	1.60	3.20	3.60	3.20	5.20	6.40	5.20
Fecal Coliform (No./100 ml) Geometric Mean	39.19	< 2.00	87.16	1.41	3.87	6.94	< 6.99	3.48	< 1.0	4.16	9.06	122.48
Fecal Coliform (No./100 ml) Instantaneous Maximum	139.60	< 4.00	410.6	2.00	7.50	48.10	48.80	12.1	1.0	17.3	41.00	2419.60
Nitrate-Nitrite (mg/L) Average Quarterly		< 24.83			< 23.90			< 9.06			< 18.65	
Total Nitrogen (mg/L) Average Quarterly		< 25.33			< 25.07			< 9.56			< 19.49	
TKN (mg/L) Average Quarterly		< 0.50			< 1.17			< 0.5			< 1.164	
Total Phosphorus (mg/L) Average Quarterly		4.41			5.62			4.88			3.88	

Existing Effluent Limitations and Monitoring Requirements

Outfall 001

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
Dissolved Oxygen	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
$CBOD_5$	14	22 Wkly Avg	XXX	25	40	50	2/month	8-Hr Composite
Total Suspended Solids	16	24 Wkly Avg	XXX	30	45	60	2/month	8-Hr Composite
BOD_5 Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	2/month	Grab
Total Suspended Solids Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	2/month	Grab
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
Nitrate-Nitrite as N	XXX	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	8-Hr Composite
Total Kjeldahl Nitrogen	XXX	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	8-Hr Composite
Total Phosphorus	XXX	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	8-Hr Composite
Total Nitrogen	XXX	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	Calculation

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.065
Latitude 40º 11' 9.34" **Longitude** -77º 51' 46.30"
Wastewater Description: Sewage Effluent

Technology-Based Limitations

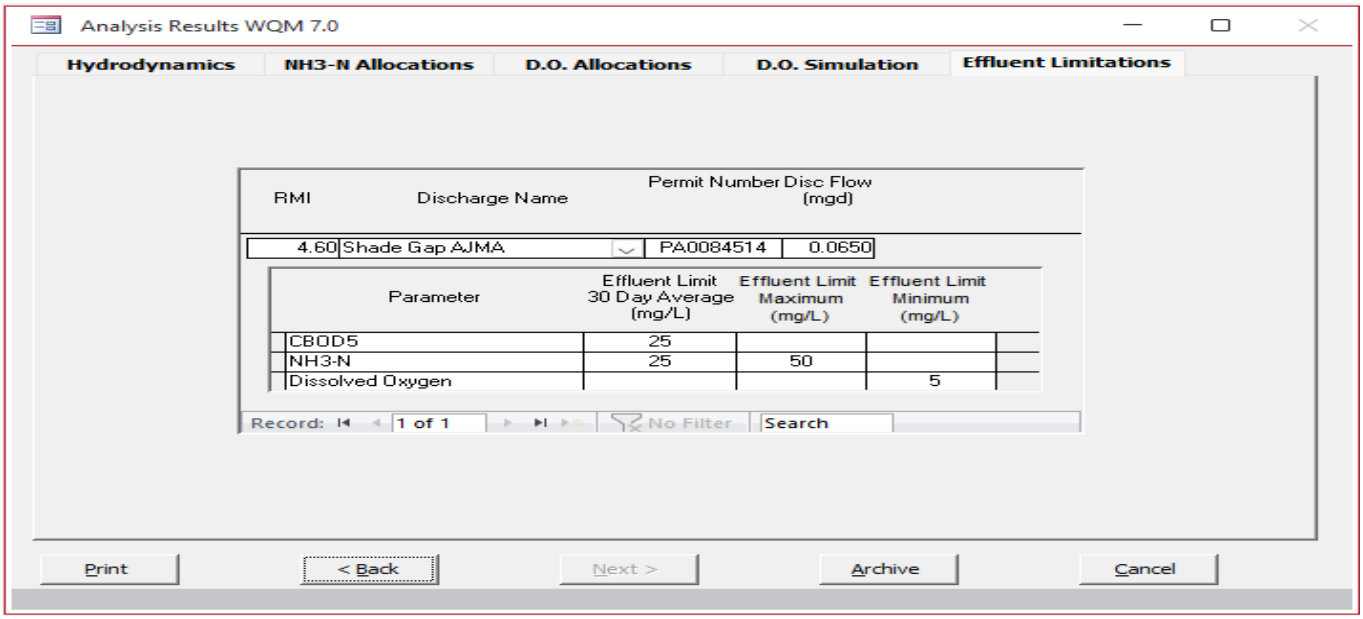
The following technology-based limitations apply, subject to water quality analysis and BPJ where applicable:

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

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 for CWF & TSF)
*	Background NH_3-N	=	0 mg/L	(Default)



The attached computer printout of the WQM 7.0 stream model indicates that no limitation on NH_3 as a monthly average is necessary to protect the aquatic life from toxicity effects.

Carbonaceous Biochemical Oxygen Demand ($CBOD_5$):
The attached computer printout of the WQM 7.0 stream model 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 limits of 25.0 mg/L monthly average (AML), 40.0 mg/L average weekly limit (AWL), and 50.0 mg/L instantaneous maximum will remain in the proposed permit as per guidance document 391-2000-014. 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: 25 mg/L x 0.065 MGD x 8.34 = 13.6 (14.0) lbs/day
Average weekly mass limit: 40 mg/L x 0.065 MGD x 8.34 = 21.7 (22.0) lbs/day

Total Suspended Solids (TSS):
The existing technology-based limits of 30.0 mg/L average monthly, 45.0 mg/L average weekly, and 60.0 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. 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 0.065 MGD x 8.34 = 16.3 (16.0) lbs/day
Average weekly mass limit: 45 mg/L x 0.065 MGD x 8.34 = 24.4 (24.0) lbs/day

Dissolved Oxygen (D.O.):
A minimum D.O. of 5.0 mg/L is required per 25 Pa. Code § 93.7. This is consistent with the previous permit and current Department criteria.

pH:
The effluent discharge pH should remain above 6 and below 9 standard units according to 25 Pa Code § 95.2(1).

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. BCW-PMT-033, version 2.0 revised February 5, 2024, 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.

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, 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. Quarterly monitoring frequency is required for this discharge since the receiving stream is not nutrient impaired. These requirements will remain in the proposed permit.

Influent BOD_5 and TSS Monitoring:
The permit will include influent BOD_5 and TSS monitoring at the same frequency as is done for effluent in order to implement 25 Pa. Code § 94.12 and assess percent removal requirements, per DEP policy.

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.

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

1	= Q stream (cfs)	0.5	= CV Daily
0.065	= 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 = 3.191	1.3.2.iii	WLA cfc = 3.104
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 1.189	5.1d	LTA_cfc = 1.804

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)**

Toxic:

Facilities with design flows less than 0.1 MGD must report at least one result per parameter. If the facility receives industrial or commercial contributions, at least one result is required for Total Copper, Total Lead, Total Zinc and any other parameters that are known or suspected to be present in effluent. The facility reported receiving wastewater from commercial/industrial sources.

The data was analyzed based on the guidelines found in DEP's Water Quality Toxics Management Strategy (Document No. 361-0100-003) and DEP's SOP No. BPNPSM-PMT-033. Spreadsheet results are attached to this fact sheet (page 14-17). 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.

Pollutant testing results on the current (2024) application were reviewed in comparison with DEP's Toxic Management Spreadsheet, version 1.4, May 2023, output recommends a routine monitoring and/or effluent limit requirements for Total Copper (Cu), Total Lead, and Total Zinc. Therefore, monthly monitoring/ effluent limitation requirements for these parameters are added in the proposed permit as follows:

☑ *Recommended WQBELs & Monitoring Requirements*

No. Samples/Month: 4

Pollutants	Mass Limits AML (lbs/day)	Mass Limits MDL (lbs/day)	Concentration Limits AML	Concentration Limits MDL	Concentration Limits IMAX	Concentration Limits Units	Governing WQBEL	WQBEL Basis	Comments

There are no pollutants recommended from TMS & monitoring requirements, therefore, no toxic monitoring requirements are needed in this renewal cycle.

Biosolids Management:
Digested Sludge is sent out periodically to the drying beds.

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

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.

303d Listed Streams:
The discharge is not located on a 303d listed stream segment. The stream segment that receives the discharge is listed as attaining its used for aquatic life and fish consumption.

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

Additional Considerations

Flow Monitoring
The requirement to monitor the volume of effluent will remain in the proposed permit per 40 CFR § 122.44(i)(1)(ii).

Monitoring Frequency and Sample Type
The facility currently is required to collect daily effluent grab samples for D.O., TRC, and pH; two per month effluent 8-hr composite samples of $CBOD_5$, and TSS; two per month effluent grab samples of Fecal Coliform; one quarter effluent 8-hr composite samples of Nitrate-Nitrite as N, Total Kjeldahl Nitrogen, and TP; and one quarter effluent calculation samples of TN. Based on the best professional judgement of the author, the existing monitoring frequencies are sufficient and necessary. Therefore, the existing monitoring frequencies will remain the same as those specified in the proposed permit.

WQM 7.0

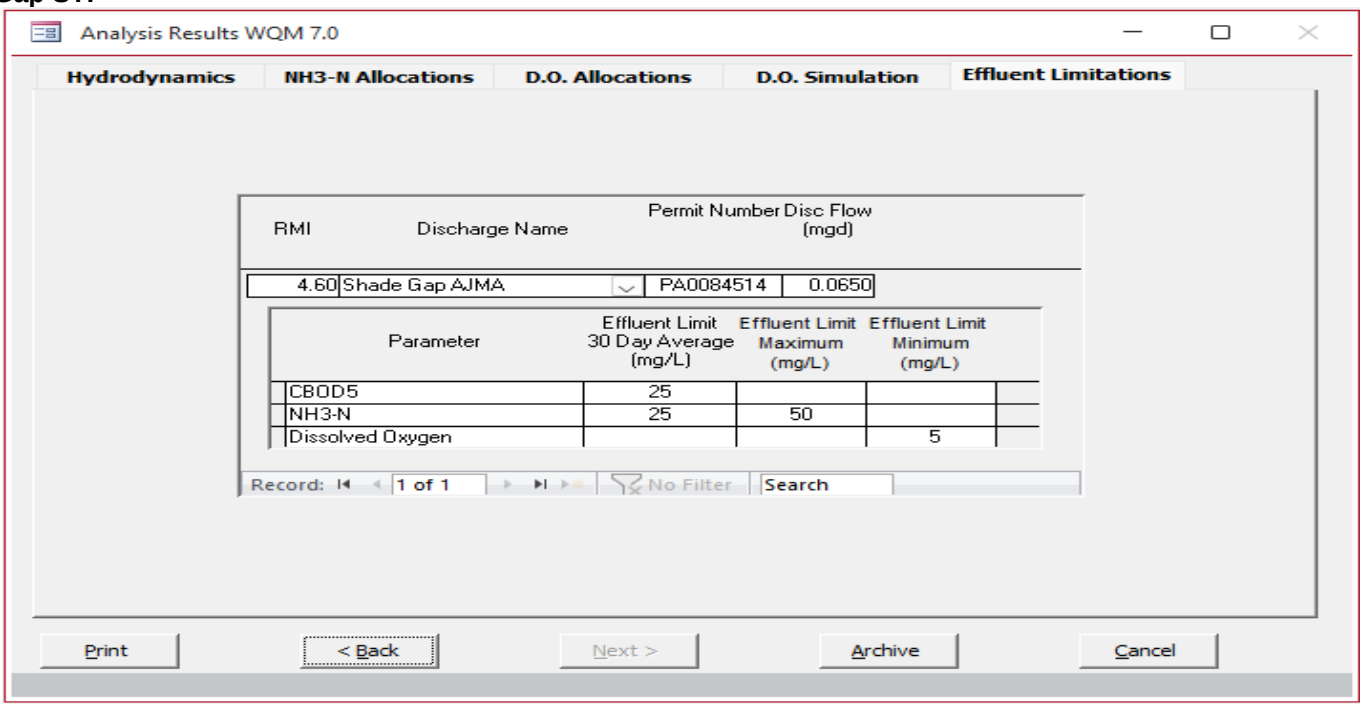
*	Discharge pH	=	7.0	(Default)
*	Discharge Temperature	=	25°C	(Default)
*	Stream pH	=	7.0	(Default)
*	Stream Temperature	=	20°C	(Default for CWF & TSF)
*	Background NH_3-N	=	0 mg/L	(Default)

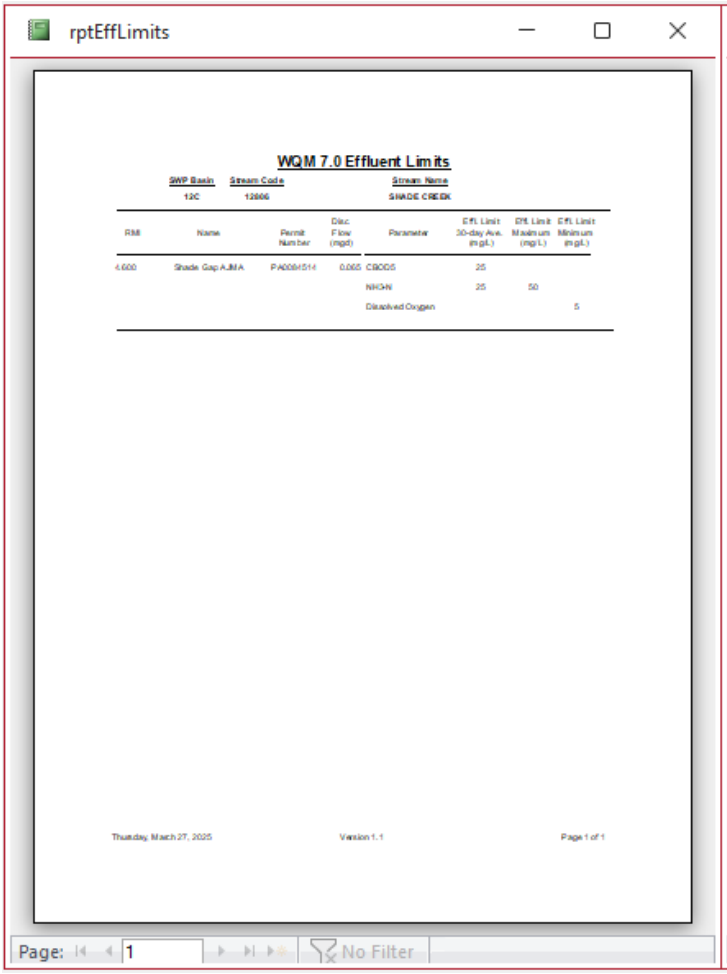
Node 1: Outfall 001 on Shade's Creek (12806)

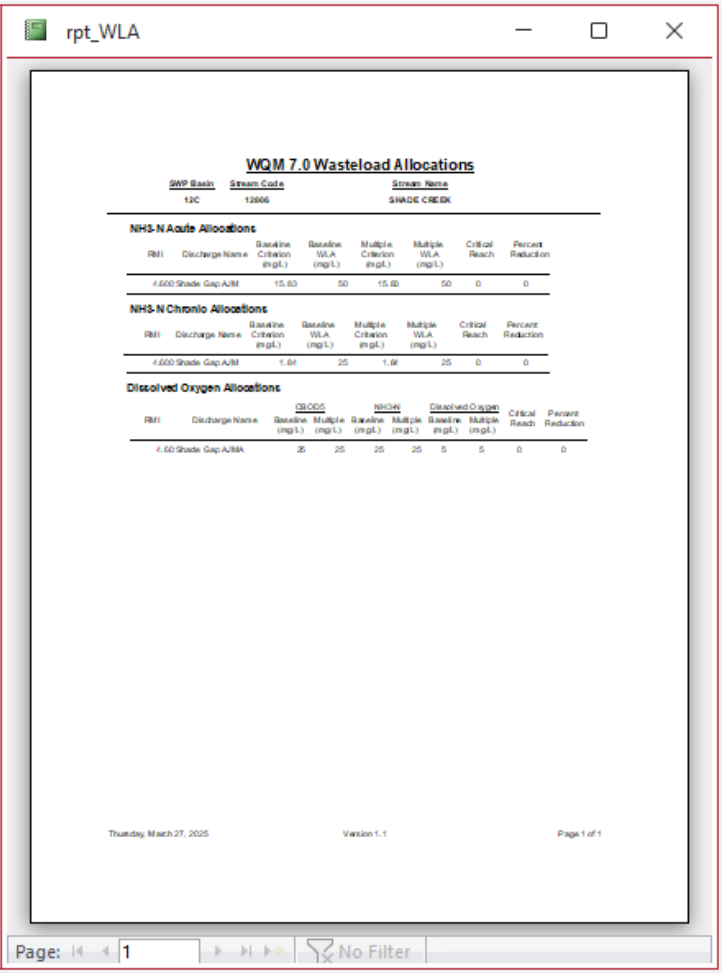
Elevation:	880 ft (USGS National Map Viewer)
Drainage Area:	19.6 $mi.^2$ (USGS PA StreamStats)
River Mile Index:	4.60 (PA DEP eMapPA)
Low Flow Yield:	0.05 $cfs/mi.^2$
Discharge Flow:	0.065 MGD (NPDES Application)

Node 2: Just before confluence with Craig Run to Shade Creek

Elevation:	812 ft (USGS National Map Viewer)
Drainage Area:	20.3 $mi.^2$ (USGS PA StreamStats)
River Mile Index:	3.23 (PA DEP eMapPA)
Low Flow Yield:	0.05 $cfs/mi.^2$
Discharge Flow:	0.000 MGD


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)
4.60
Shade Gap AJMA
PA0084514
0.0650
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
Print
< Back
Next >
Archive
Cancel


rptEffLimits
WQM 7.0 Effluent Limits
SWP Basin
Stream Code
Stream Name
12C
12006
SHADE CREEK
RMI
Name
Permit Number
Disc Flow (mgd)
Parameter
Effl. Limit 30-day Ave. (mg/L)
Effl. Limit Maximum (mg/L)
Effl. Limit Minimum (mg/L)
4.600
Shade Gap AJMA
PA0084514
0.065
CBOD5
25
NH3N
25
50
Dissolved Oxygen
5
Thursday, March 27, 2025
Version 1.1
Page 1 of 1
Page: 1
No Filter


rpt_WLA
WQM 7.0 Wasteload Allocations
SWP Basin
Stream Code
Stream Name
12C
12006
SHADE CREEK
NH3-N Acute Allocations
RMI
Discharge Name
Baseline Criterion (mg/L)
Baseline WLA (mg/L)
Multiple Criterion (mg/L)
Multiple WLA (mg/L)
Critical Reach
Percent Reduction
4.600
Shade Gap AJM
15.63
50
15.60
50
0
0
NH3-N Chronic Allocations
RMI
Discharge Name
Baseline Criterion (mg/L)
Baseline WLA (mg/L)
Multiple Criterion (mg/L)
Multiple WLA (mg/L)
Critical Reach
Percent Reduction
4.600
Shade Gap AJM
1.84
25
1.96
25
0
0
Dissolved Oxygen Allocations
RMI
Discharge Name
CBOD5
NH3-N
Dissolved Oxygen
Baseline (mg/L)
Multiple (mg/L)
Baseline (mg/L)
Multiple (mg/L)
Baseline (mg/L)
Multiple (mg/L)
Critical Reach
Percent Reduction
4.60
Shade Gap AJMA
25
25
25
25
5
5
0
0
Thursday, March 27, 2025
Version 1.1
Page 1 of 1
Page: 1
No Filter

rptDOSim

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
12C	12806	SHADE CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
4.600	0.065	20.465	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
16.785	0.536	31.326	0.120
Reach CBOD5 (mg/L)	**Reach Kr (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
4.14	0.646	2.33	0.726
Reach DO (mg/L)	Reach Kr (1/days)	Kr Equation	Reach DO Goal (mg/L)
7.941	10.851	Tsivoglou	5
Reach Travel Time (days)			
0.097			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.070	3.95	2.21	7.98
0.139	3.78	2.10	8.03
0.209	3.61	2.00	8.08
0.279	3.44	1.90	8.12
0.348	3.28	1.81	8.17
0.418	3.14	1.72	8.17
0.488	3.00	1.63	8.17
0.557	2.87	1.55	8.17
0.627	2.76	1.48	8.17
0.697	2.68	1.40	8.17

Thursday, March 27, 2025 Version 1.1 Page 1 of 1

Page: 1 No Filter

rptModelSpecs

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows ☑
W/A Method	EMPR	Use Inputted W/D Ratio ☐
Q1-10/Q7-10 Ratio	0.64	Use Inputted Reach Travel Times ☐
Q30-10/Q7-10 Ratio	1.36	Temperature Adjust Kr ☑
D.O. Saturation	90.00%	Use Balanced Technology ☑
D.O. Goal	5	

Thursday, March 27, 2025 Version 1.1 Page 1 of 1

Page: 1 No Filter

rptHydro

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
12C	12806	SHADE CREEK

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Reach Trav Time (days)	Analysis Temp (°C)	Analysis pH
Q7-10 Flow												
4.600	0.98	0.00	0.98	.1000	0.00940	.536	16.79	31.33	0.12	0.097	20.47	7.00
Q1-10 Flow												
4.600	0.63	0.00	0.63	.1000	0.00940	NA	NA	NA	0.10	0.869	20.09	7.00
Q30-10 Flow												
4.600	1.33	0.00	1.33	.1000	0.00940	NA	NA	NA	0.14	0.595	20.35	7.00

Thursday, March 27, 2025 Version 1.1 Page 1 of 1

Page: 1 No Filter

rptGeneral

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
12C	12806	SHADE CREEK	**4.600**	880.00	19.60	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfs/mi)	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
QT-10	0.000	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

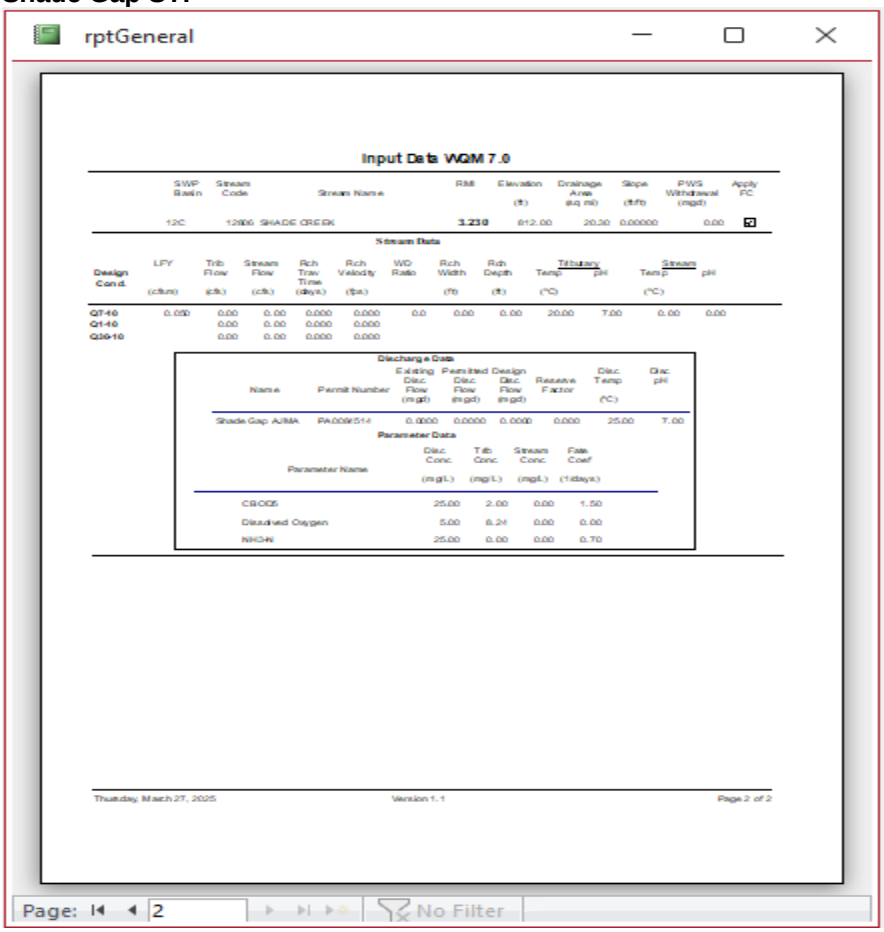
Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Shade Gap A/WA	PA0084514	0.0650	0.0650	0.0650	0.000	25.00	7.00

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

Thursday, March 27, 2025 Version 1.1 Page 1 of 2

Page: 1 No Filter



ADDITONAL EFFLUENT TESTING

PARAMETER	MIN/MAX VALUE		AVERAGE VALUE		NO. SAMPLES	SAMPLE TYPE
	Value	Units	Value	Units		
Stream Hardness (Maximum)	170	mg/L as CaCO3	140.6	mg/L as CaCO3	3	Grab
Stream Hardness (Minimum)	112	mg/L as CaCO3	140.6	mg/L as CaCO3	3	Grab
Stream pH (Maximum)	8.0	S.U.	7.8	S.U.	3	Grab
Stream pH (Minimum)	7.5	S.U.	7.8	S.U.	3	Grab

Toxic:

- Discharge pH = 7.4 (average 2024 renewal application)
- Discharge Hardness = 100 mg/L (Dedault)
- Stream pH = 8.0 (2024 renewal application)
- Stream Hardness = 170 mg/L (2024 renewal application)
- Background NH_3-N = 0 mg/L (Default)

Node 1: Outfall 001 on Shade's Creek (12806)
Elevation: 880 ft (USGS National Map Viewer)
Drainage Area: 19.6 $mi.^2$ (USGS PA StreamStats)
River Mile Index: 4.60 (PA DEP eMapPA)
Low Flow Yield: 0.05 $cfs/mi.^2$
Discharge Flow: 0.065 MGD (NPDES Application)

Node 2: Just before confluence with Craig Run to Shade Creek
Elevation: 812 ft (USGS National Map Viewer)
Drainage Area: 20.3 $mi.^2$ (USGS PA StreamStats)
River Mile Index: 3.23 (PA DEP eMapPA)
Low Flow Yield: 0.05 $cfs/mi.^2$
Discharge Flow: 0.000 MGD

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.4, May 2023

Discharge Information

Instructions | Discharge | Stream

Facility: **Shade Gap AJMA** NPDES Permit No.: **PA0084514** Outfall No.: **001**

Evaluation Type: **Custom / Additives** Wastewater Description: **Shade Creek**

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
0.065	100	7.4						

				0 if left blank		*0.5 if left blank*		*0 if left blank*			*1 if left blank*	
Discharge Pollutant	Units	Max Discharge Conc		Trib Conc	Stream Conc	Daily CV	Hourly CV	Stream CV	Fate Coeff	FOS	Criteria Mod	Chem Transl
Total Copper	mg/L		0.01									
Total Lead	mg/L		0.00021									
Total Zinc	mg/L		0.034									

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.4, May 2023

Stream / Surface Water Information

Shade Gap AJMA, NPDES Permit No. PA0084514, Outfall 001

Instructions | Discharge | Stream

Receiving Surface Water Name: **Shade Creek**

No. Reaches to Model: 1

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

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi²)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	012806	4.6	880	19.6			Yes
End of Reach 1	012806	3.23	812	20.3			Yes

$Q_{7\text{-}10}$

Location	RMI	LFY (cfs/mi²)*	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	4.6	0.05										170	8		
End of Reach 1	3.23	0.05													

Q_h

Location	RMI	LFY (cfs/mi²)	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	4.6														
End of Reach 1	3.23														

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.4, May 2023

Model Results

Shade Gap AJMA, NPDES Permit No. PA0084514, Outfall 001

Instructions | Results | RETURN TO INPUTS | SAVE AS PDF | PRINT | (●) All | ( ) Inputs | ( ) Results | ( ) Limits

☐ ***Hydrodynamics***

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 8.354 PMF: 1 Analysis Hardness (mg/l): 163.49 Analysis pH: 7.89

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	21.356	22.2	239	Chem Translator of 0.96 applied
Total Lead	0	0		0	109.811	153	1,640	Chem Translator of 0.719 applied
Total Zinc	0	0		0	177.720	182	1,953	Chem Translator of 0.978 applied

☑ ***CFC*** CCT (min): 8.354 PMF: 1 Analysis Hardness (mg/l): 163.49 Analysis pH: 7.89

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	13.631	14.2	153	Chem Translator of 0.96 applied
Total Lead	0	0		0	4.279	5.95	63.9	Chem Translator of 0.719 applied
Total Zinc	0	0		0	179.174	182	1,953	Chem Translator of 0.986 applied

☑ ***THH*** CCT (min): 8.354 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): 2.775 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

☑ ***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).

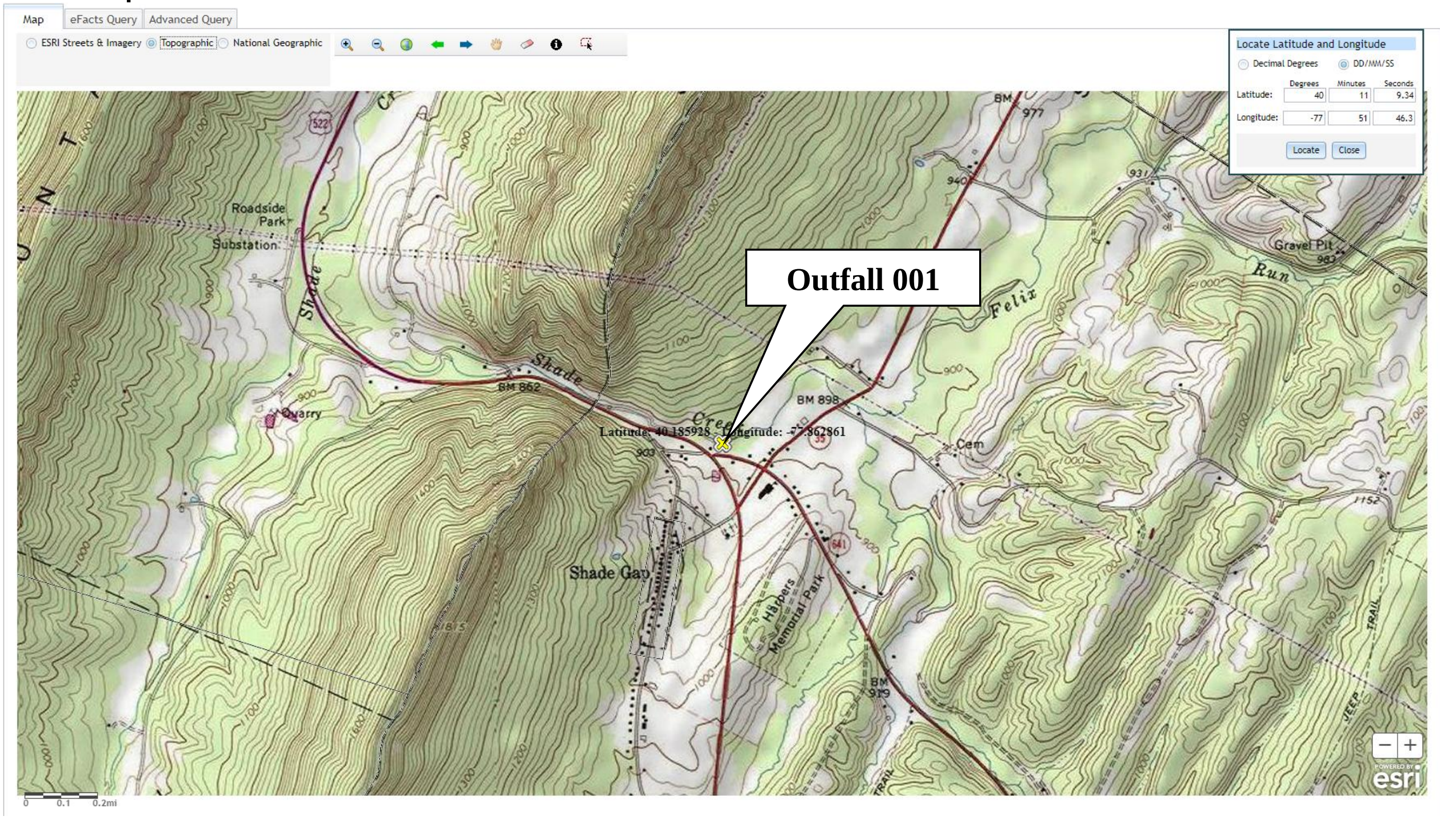
Pollutants	Governing WQBEL	Units	Comments
Total Copper	0.15	mg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	63.9	µg/L	Discharge Conc ≤ 10% WQBEL
Total Zinc	1.25	mg/L	Discharge Conc ≤ 10% WQBEL

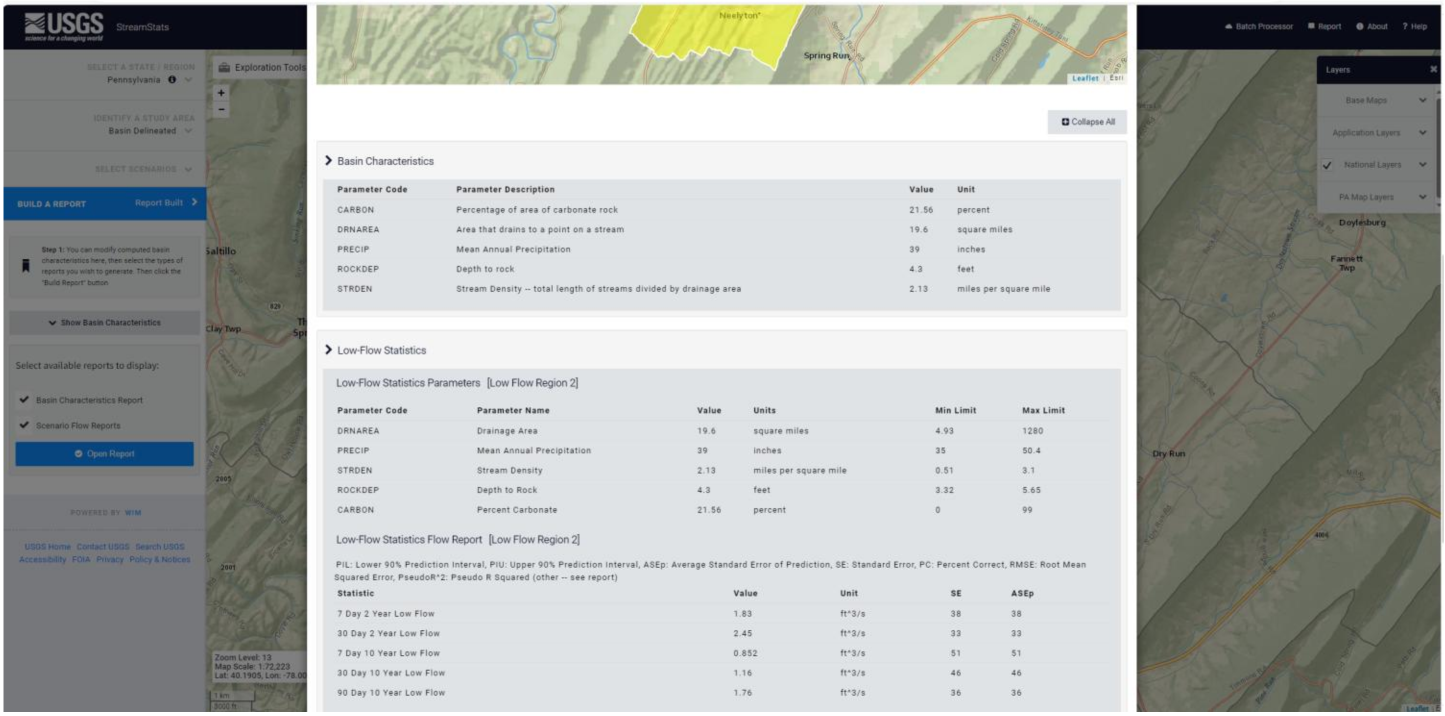
Proposed Effluent Limitations and Monitoring Requirements

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	Daily Maximum	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
D.O.	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
$CBOD_5$	14.0	22.0	XXX	25.0	40.0	50.0	2/month	8-Hr Composite
BOD_5 Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	2/month	Grab
TSS	16.0	24.0	XXX	30.0	45.0	60.0	2/month	8-Hr Composite
TSS Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	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
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	2/month	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/quarter	Grab
Nitrate-Nitrite	XXX	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	8-Hr Composite
Total Nitrogen	XXX	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	Calculation
TKN	XXX	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	8-Hr Composite
Total Phosphorus	XXX	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	8-Hr Composite





Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
CARBON	Percentage of area of carbonate rock	21.56	percent
DRNAREA	Area that drains to a point on a stream	19.6	square miles
PRECIP	Mean Annual Precipitation	39	inches
ROCKDEP	Depth to rock	4.3	feet
STRDEN	Stream Density -- total length of streams divided by drainage area	2.13	miles per square mile

Low-Flow Statistics

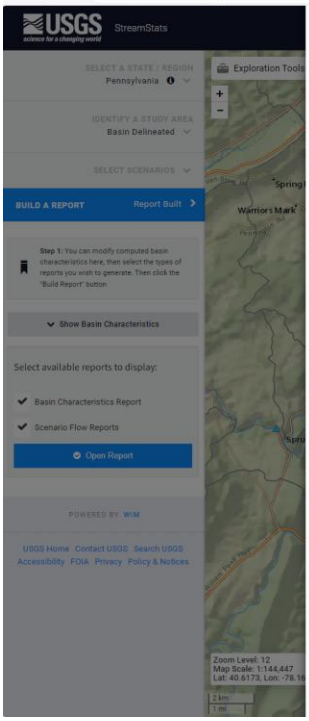
Low-Flow Statistics Parameters [Low Flow Region 2]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	19.6	square miles	4.93	1280
PRECIP	Mean Annual Precipitation	39	inches	35	50.4
STRDEN	Stream Density	2.13	miles per square mile	0.51	3.1
ROCKDEP	Depth to Rock	4.3	feet	3.32	5.65
CARBON	Percent Carbonate	21.56	percent	0	99

Low-Flow Statistics Flow Report [Low Flow Region 2]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	1.83	ft^3/s	38	38
30 Day 2 Year Low Flow	2.45	ft^3/s	33	33
7 Day 10 Year Low Flow	0.852	ft^3/s	51	51
30 Day 10 Year Low Flow	1.16	ft^3/s	46	46
90 Day 10 Year Low Flow	1.76	ft^3/s	36	36



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
CARBON	Percentage of area of carbonate rock	5.12	percent
DRNAREA	Area that drains to a point on a stream	129	square miles
PRECIP	Mean Annual Precipitation	38	inches
ROCKDEP	Depth to rock	4.3	feet
STRDEN	Stream Density -- total length of streams divided by drainage area	1.7	miles per square mile

Low-Flow Statistics

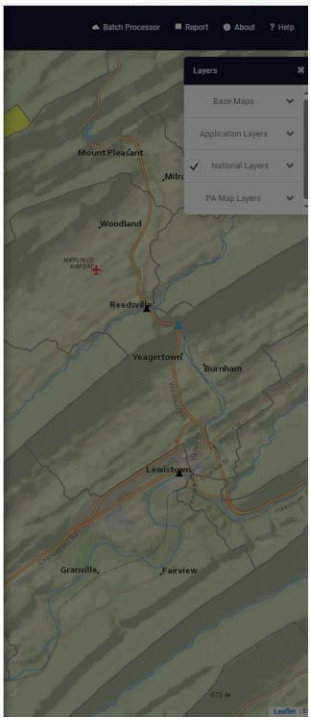
Low-Flow Statistics Parameters [Low Flow Region 2]

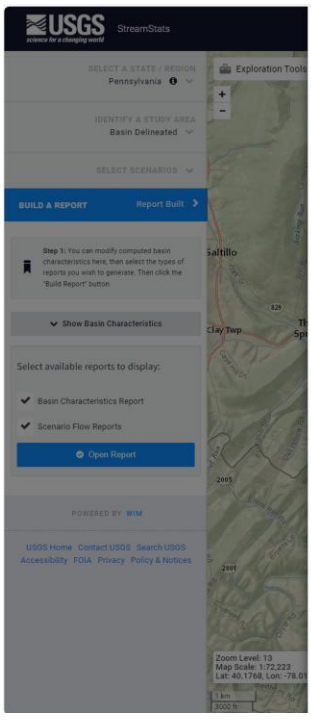
Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	129	square miles	4.93	1280
PRECIP	Mean Annual Precipitation	38	inches	35	50.4
STRDEN	Stream Density	1.7	miles per square mile	0.51	3.1
ROCKDEP	Depth to Rock	4.3	feet	3.32	5.65
CARBON	Percent Carbonate	5.12	percent	0	99

Low-Flow Statistics Flow Report [Low Flow Region 2]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	13.2	ft^3/s	38	38
30 Day 2 Year Low Flow	17.6	ft^3/s	33	33
7 Day 10 Year Low Flow	6.7	ft^3/s	51	51
30 Day 10 Year Low Flow	9.04	ft^3/s	46	46
90 Day 10 Year Low Flow	14.1	ft^3/s	36	36





Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
CARBON	Percentage of area of carbonate rock	21.39	percent
DRNAREA	Area that drains to a point on a stream	20.3	square miles
PRECIP	Mean Annual Precipitation	39	inches
ROCKDEP	Depth to rock	4.3	feet
STRDEN	Stream Density -- total length of streams divided by drainage area	2.12	miles per square mile

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region 2]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	20.3	square miles	4.93	1280
PRECIP	Mean Annual Precipitation	39	inches	35	50.4
STRDEN	Stream Density	2.12	miles per square mile	0.51	3.1
ROCKDEP	Depth to Rock	4.3	feet	3.32	5.65
CARBON	Percent Carbonate	21.39	percent	0	99

Low-Flow Statistics Flow Report [Low Flow Region 2]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	1.9	ft^3/s	38	38
30 Day 2 Year Low Flow	2.55	ft^3/s	33	33
7 Day 10 Year Low Flow	0.889	ft^3/s	51	51
30 Day 10 Year Low Flow	1.21	ft^3/s	46	46
90 Day 10 Year Low Flow	1.84	ft^3/s	36	36

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: