pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Application Type	**Renewal**	Application No.	**PA0248088**
Facility Type	**Non-Municipal**	APS ID	**823945**
Major / Minor	**Minor**	Authorization ID	**1241798**

Applicant and Facility Information

Applicant Name	**PA American Water Co.**	Facility Name	**Franklin Waste Water Treatment Plant**
Applicant Address	852 Wesley Drive	Facility Address	2410 Chambersburg Road
	Mechanicsburg, PA 17055		Gettysburg, PA 17325
Applicant Contact	Cody Cutler	Facility Contact	Dave Boore
Applicant Phone	(717) 663-9933	Facility Phone	(717) 691-2106
Client ID	87712	Site ID	665661
Ch 94 Load Status	Not Overloaded	Municipality	Franklin Township
Connection Status	No Limitations	County	Adams
Date Application Received	August 2, 2018	EPA Waived?	Yes
Date Application Accepted	August 29, 2018	If No, Reason	
Purpose of Application	NPDES permit renewal.		

Summary of Review

PA American Water submitted a NPDES renewal application for discharge of treated sewage from the Franklin Waste Water Treatment Facility located in Franklin Township, Adams County. The permit was last issued on January 22, 2014 and became effective on February 1, 2014. The existing permit expired on January 31, 2019, and the permit has been administratively extended since that time.

The Franklin Waste Water Treatment Facility has 70% sewers from Franklin Township and 30% sewer from Hamilton-Ban Township. The NPDES permit No. PA0248088 was amended on July 29, 2014 to correct the flow of 0.2 MGD while the hydraulic design flow of 0.5 MGD.

The Water Quality Management (WQM) Permit No. 016404 was issued on April 17, 2007, was amended on April 22, 2014 to change the ownership from the Franklin Township, Adams County to Pennsylvania American Water Company (#016404 T-1).

Changes from the previous permit: Unit of Fecal Coliform changed from CFU/100 ml to No./100 ml.

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

Approve	Deny	Signatures	Date
X		Hilary H. Le / Environmental Engineering Specialist	December 10, 2019
		Daniel W. Martin, P.E. / Environmental Engineer Manager	
		Maria D. Bebenek, P.E. / Clean water Program Manager	

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	001	Design Flow (MGD)	0.2
Latitude	39º 51' 46.13"	Longitude	-77º 19' 1.73"
Quad Name	Fairfield	Quad Code	
Wastewater Description:	Sewage Effluent		
Receiving Waters	Unnamed Tributary to Marsh Creek (CWF)	Stream Code	59009
NHD Com ID	53319832	RMI	1.92 miles
Drainage Area	1.71 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)	584	Slope (ft/ft)	
Watershed No.	13-D	Chapter 93 Class.	CWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	FLOW REGIME MODIFICATION,		
Source(s) of Impairment	HIGHWAY/ROAD/BRIDGE RUNOFF (NON-CONSTRUCTION RELATED), RURAL (RESIDENTIAL AREAS)		
TMDL Status		Name	
Nearest Downstream Public Water Supply Intake	Gettysburg Municipal Authority, Adams County		
PWS Waters	Marsh Creek	Flow at Intake (cfs)	
PWS RMI	8.12 miles	Distance from Outfall (mi)	Approximate 9 miles

Drainage Area

The discharge is to Tributary 59009 to Marsh Creek at RMI 1.92 miles. A drainage area upstream of the discharge is estimated to be 1.71 mi.^{2}, according to USGS PA StreamStats available at https://streamstats.usgs.gov/ss/.

Streamflow

The entire watershed of UNT 59009 is also too small. Therefore, the upper portion of Marsh Creek (until just after its confluence with Mummasburg Run) was chosen as a proper representative drainage area. According to USGS StreamStats, the Q_{7-10} at the exit point of this watershed is 1.11 cfs and the drainage area is 21.3 mi.^{2} which results in a Q_{7-10} low flow yield of 0.052 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 = 1.11 cfs / 21.3 mi.^{2} ≈ 0.052 cfs/mi.^{2}
Q_{7-10} = 0.052 cfs/mi.^{2} * 1.71 mi.^{2} ≈ 0.089 cfs
Q_{30-10} = 1.36 * 0.089 cfs ≈ 0.12 cfs
Q_{1-10} = 0.64 * 0.089 cfs ≈ 0.057 cfs

The resulting dilution ratio (under Q_{7-10} conditions) is: Q_{stream} / $Q_{discharge}$ = 0.089 cfs / [0.500 MGD * (1.55 cfs/MGD)] = 0.11:1

Unnamed Tributary to Marsh Creek

25 Pa Code § 93.9z classifies Tributaries 59009 to Marsh Creek as cold-water fishes. The eMap PA lists Unnamed Tributary to Marsh Creek as impaired due to small residential runoff and road runoff caused by flow regime modification. A TMDL does not currently exist for this stream segment.

Public Water Supply

The nearest downstream public water supply is Gettysburg Municipal Authority facility, Adams County on Marsh Creek Reservoir, approximately 9 miles downstream of the discharge point. Based on the nature of discharge, the discharge is not expected to impact the public water supply standards.

Treatment Facility Summary				
Treatment Facility Name: Franklin Waste Water Treatment Plant				
WQM Permit No.	**Issuance Date**			
016404	4/17/2007			
016404 T-1	4/22/2014			
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Secondary With Ammonia And Phosphorus	Sequencing Batch Reactor	Hypochlorite	0.2
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.5	459	Not Overloaded	Aerobic Digestion	Other WWTP

The WWTP train is as follows:

Mechanical Screen (1) ⇒ Bar Screen (1) ⇒ SBR Tank (2) ⇒ Chlorine Contact Tank (1) ⇒ Dechlorination Feed (1) ⇒ Cascade (1) ⇒ Discharge

The SBR plant has four cycles per day; each with a 60 minute decant phase. The design decant rate is 926 gpm (1.33 MGD).

The system incorporates chemical addition in the form of sodium hypochlorite, sodium bisulfite, and alum. Two sludge holding tanks are used for solids storage.

Compliance History	
Summary of DMRs:	DMRs reported last 12 months from November 1, 2018 to October 31, 2019 are summarized in the Table below (Pages # 5 & 6).
Summary of Inspections:	11/28/2017: Mr. Bowen, DEP WQS, conducted compliance evaluation inspection. The recommendations were revised September 2017 DMR to include 9/19/17 results for TP, TKN, and NO_2-NO_3; include all test results on monthly and annual DMRs, and calibrate pH and DO meter daily. There was no violation noted during inspection. 2/24/2016: Mr. Haines, DEP WQS, conducted compliance evaluation inspection. The effluent was clear. The sample test results were within permitted range. There was no violation noted during inspection.
Other Comments:	There are no open violations associated with this facility or permittee.

Other Comments: DMRs for the past 12 months indicated operating satisfactorily.

Other Comments cont.

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)	118/444 mg/L	254 mg/L
BOD_5 (lbs/day)	48/313 lbs/day	206 lbs/day
TSS (mg/L)	119/1038 mg/L	295 mg/L
TSS (lbs/day)	48/545 lbs/day	137 lbs/day
TN (mg/L)	19.8 mg/L	19.8 mg/L
TN (lbs/day)	No Data lbs/day	No Data lbs/day
TP (mg/L)	2.7 mg/L	2.7 mg/L
TP (lbs/day)	No Data lbs/day	No Data lbs/day
NH_3-N (mg/L)	17 mg/L	17 mg/L
NH_3-N (lbs/day)	NO Data lbs/day	No Data lbs/day
TDS (mg/L)	452 mg/L	452 mg/L
TDS (lbs/day)	No Data lbs/day	No Data lbs/day
TKN	19 mg/L	19 mg/L
NO_2-N + NO_3-N	< 0.8 mg/L	< 0.8 mg/L

Effluent Testing Results

Parameter	Min/Max Value	Average Value
pH (minimum)	6.4 S.U.	
pH (maximum)	7.5 S.U.	
D.O (minimum)	5.0/6.8 mg/L	5.9 mg/L
TRC	0.01/0.09 mg/L	0.03 mg/L
Fecal Coliform	2.0/520 No./100mL	74.2 No./100 mL
$CBOD_5$	3/16 mg/L	5.66 mg/L
TSS	1/15 mg/L	4.57 mg/L
NH_3-N	< 0.01/2.2 mg/L	0.276 mg/L
TN	1.2/3.6 mg/L	2.57 mg/L
TP	3.6 mg/L	3.6 mg/L
Temp	No Data	No Data
TKN	0.65/1.6 mg/L	1.28 mg/L
NO_2-N + NO_3-N	< 0.4/1.6 mg/L	0.81 mg/L
TDS	1032 mg/L	1032 mg/L
Chloride	85 mg/L	85 mg/L
Bromide	0.60 mg/L	0.60 mg/L
Sulfate	43 mg/L	43 mg/L
Oil and Grease	No Data mg/L	No Data mg/L
Total Copper	No Data mg/L	No data mg/L
Total Lead	No Data mg/L	No Data mg/L
Total Zinc	No Data mg/L	No Data mg/L

Compliance History

DMR Data for Outfall 001 (from November 1, 2018 to October 31, 2019)

Parameter	OCT-19	SEP-19	AUG-19	JUL-19	JUN-19	MAY-19	APR-19	MAR-19	FEB-19	JAN-19	DEC-18	NOV-18
Flow (MGD) Average Monthly	0.0682	0.0674	0.062	0.0637	0.0687	0.1168	0.0919	0.0974	0.0959	0.1006	0.1073	0.1334
Flow (MGD) Daily Maximum	0.1104	0.0942	0.1089	0.0837	0.1174	0.3124	0.1982	0.1861	0.1912	0.1905	0.1703	0.2241
pH (S.U.) Minimum	6.8	7.0	7.1	7.2	6.9	6.9	7.0	6.9	6.9	7.1	6.8	7.0
pH (S.U.) Maximum	7.2	7.3	7.3	7.3	7.3	7.3	7.4	7.3	7.3	7.4	7.6	7.5
DO (mg/L) Minimum	5.5	5.4	5.1	5.1	5.1	5.4	6.8	7.2	6.7	7.1	7.0	6.6
TRC (mg/L) Average Monthly	0.020	0.020	0.020	0.010	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020
TRC (mg/L) Instantaneous Maximum	0.030	0.020	0.020	0.030	0.040	0.030	0.030	0.030	0.030	0.030	0.030	0.030
$CBOD_5$ (lbs/day) Average Monthly	< 2.5	< 1.6	1.4	< 2.1	< 1.6	< 3.0	< 2.1	< 2.1	2.4	< 2.2	< 2.0	< 4.0
$CBOD_5$ (lbs/day) Weekly Average	6.0	2.4	1.5	2.8	1.8	4.8	< 2.8	< 2.6	3.0	2.7	< 3.0	5.0
$CBOD_5$ (mg/L) Average Monthly	< 4	< 4	3	< 4.0	3	< 3	< 3	< 3	3	< 3	3.0	3.0
$CBOD_5$ (mg/L) Weekly Average	9	6	3	5.0	3	3	< 3	< 3	3	3	< 3.0	3
BOD_5 (lbs/day) Raw Sewage Influent Average Monthly	135	123	86	106	170	120	317	90	120	142	90	144
BOD_5 (lbs/day) Raw Sewage Influent Daily Maximum	207	187	124	176	255	151	934	114	149	243	103	233
BOD_5 (mg/L) Raw Sewage Influent Average Monthly	259	280	186	190	340	197	229	133	155	189	119	118
TSS (lbs/day) Average Monthly	1.0	2.0	1.5	1.6	4.5	4.0	2.9	0.9	1.4	2.5	2.0	2.0
TSS (lbs/day) Raw Sewage Influent Average Monthly	129	109	107	127	171	123	313	98	128	389	97	218
TSS (lbs/day) Raw Sewage Influent Daily Maximum	200	134	211	224	265	165	1008	138	183	229	153	418
TSS (lbs/day) Weekly Average	2.5	4.7	3.7	2.8	11.4	6.3	5.6	1.5	2.4	5.9	4.0	3.0
TSS (mg/L) Average Monthly	2	5	3	3	8	6	4	1	2	3	3.0	2

TSS (mg/L) Raw Sewage Influent Average Monthly	246	249	231	223	345	185	206	142	164	203	121	173
TSS (mg/L) Weekly Average	5	10	8	5	19	13	6	2	3	8	6.0	2
Fecal Coliform (CFU/100 ml) Geometric Mean	< 16	28	175	> 45	9	34	11	1	8	< 1	1.2	1.0
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	961	183	600	196	104	100	140	3	172	2	2.0	1.0
Nitrate-Nitrite (mg/L) Average Monthly	8.5	1.31	0.93	< 2.7	< 0.95	0.62	3.12	< 9.2	5.96	6.0	< 3.3	< 5.5
Nitrate-Nitrite (lbs) Total Monthly	< 125	22	19	< 50	20	27	< 54	< 218	136	< 131	89	< 168
Total Nitrogen (mg/L) Average Monthly	< 9.04	< 2.62	3.29	< 3.69	< 3.49	< 3.14	< 3.98	< 9.84	< 12.42	< 6.6	< 4.99	< 6.1
Total Nitrogen (lbs) Total Monthly	< 133	< 35	48	< 70	< 51	< 78	< 63	< 235	< 315	< 144	< 106	< 186
Total Nitrogen (lbs) Other Annual Final Effluent Total Annual											1885	
Ammonia (lbs/day) Average Monthly	< 0.07	< 0.08	0.3	0.2	< 0.7	< 0.3	0.07	< 0.08	0.1	< 0.09	0.08	< 0.1
Ammonia (mg/L) Average Monthly	< 0.14	< 0.19	0.65	0.33	< 0.3	< 0.25	< 0.1	< 0.12	0.13	< 0.11	< 0.1	< 0.1
Ammonia (lbs) Total Monthly	< 2.2	< 2.4	9.3	5.0	< 10.1	< 8.5	< 2.1	< 2.6	2.9	< 2.7	< 2.4	< 3.6
Ammonia (lbs) Other Annual Final Effluent Total Annual											55	
TKN (mg/L) Average Monthly	< 0.54	1	2	1.04	2.4	2.2	< 0.5	0.69	0.52	< 0.56	0.84	< 0.5
TKN (lbs) Total Monthly	< 8	12	29	21	35	51	< 10	17	13	< 12	18	< 15
Total Phosphorus (lbs/day) Average Monthly	2	2	2	3	2	1	4	2	2	2	2	2
Total Phosphorus (mg/L) Average Monthly	3.8	4.9	4.8	4.1	4.8	1.95	4.7	2.3	2.3	2.6	2.5	1.8
Total Phosphorus (lbs) Total Monthly	53	66	69	79	74	30	107	55	57	55	53	55
Total Phosphorus (lbs) Other Annual Final Effluent Total Annual											997	

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.2
Latitude 39º 51' 47.00" **Longitude** -77º 19' 2.00"
Wastewater Description: Sewage Effluent

Technology-Based Limitations

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

Pollutant	Limit (mg/l)	SBC	Federal Regulation	State Regulation
$CBOD_5$	25	Average Monthly	133.102(a)(4)(i)	92a.47(a)(1)
	40	Average Weekly	133.102(a)(4)(ii)	92a.47(a)(2)
Total Suspended Solids	30	Average Monthly	133.102(b)(1)	92a.47(a)(1)
	45	Average Weekly	133.102(b)(2)	92a.47(a)(2)
pH	6.0 – 9.0 S.U.	Min – Max	133.102(c)	95.2(1)
Fecal Coliform (5/1 – 9/30)	200 / 100 ml	Geo Mean	-	92a.47(a)(4)
Fecal Coliform (5/1 – 9/30)	1,000 / 100 ml	IMAX	-	92a.47(a)(4)
Fecal Coliform (10/1 – 4/30)	2,000 / 100 ml	Geo Mean	-	92a.47(a)(5)
Fecal Coliform (10/1 – 4/30)	10,000 / 100 ml	IMAX	-	92a.47(a)(5)
Total Residual Chlorine	0.5	Average Monthly	-	92a.48(b)(2)

Water Quality-Based Limitations

Carbonaceous Biochemical Oxygen Demand ($CBOD_5$):
The attached computer printout of the WQM 7.0 stream model indicates that a monthly average limit of 25 mg/L, or secondary treatment, is adequate to protect the water quality of the stream. The existing limits of 25 mg/L average monthly (AML), 40 mg/L average weekly limit (AWL), and 50 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 0.200 MGD x 8.34 = 41.7 (42.0) lbs/day
Average weekly mass limit: 40 mg/L x 0.200 MGD x 8.34 = 66.7 (67.0) lbs/day

Ammonia (NH_3-N):
NH_3-N calculations were first 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 computer model of the stream:

Discharge pH	=	7.0	(Default)
Discharge Temperature	=	20°C	(Default)
Stream pH	=	7.0	(Default)
Stream Temperature	=	20ºC	(Default for CWF)
Background NH_3-N	=	0	(Default)

The model input data and results are attached. The printout of the WQM 7.0 output indicates that at a discharge of 0.200 MGD, limits (rounded according to the NPDES Technical Guidance 362-0400-001) of 2.5 mg/L NH_3-N as a monthly average and 5.0 mg/L NH_3-N instantaneous maximum are necessary to protect the aquatic life from toxicity effects. The existing summer limits of 2.5 mg/L and 5.0 mg/L will remain in the proposed permit. Mass limits are calculated as follows:

Average monthly summer mass limit: 2.5 mg/L x 0.200 MGD x 8.34 = 4.2 lbs/day

The winter effluent limit will be set at three-times the summer limits; therefore, the average monthly winter limit for NH_3-N will be 7.5 mg/L (2.5 mg/L x 3). For the same reason, the instantaneous maximum limit for the winter season will be 15 mg/L (5 mg/L x 3). Recent DMRs and inspection reports indicate that these limits are being attained easily.

Average monthly winter mass limit: 7.5 mg/L x 0.200 MGD x 8.34 = 12.5 lbs/day

Total Suspended Solids (TSS):

There is no water quality criterion for TSS. A limit of 30 mg/L AML will be required based on the minimum level of effluent quality attainable by secondary treatment as defined in 40 CFR 133.102b(1) and 25 PA § 92a.47(a)(1), and an AWL of 45 mg/L per 40CFR 133.102(b)(2) and 25 PA § 92a.47(a)(2). Past 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 0.200 MGD x 8.34 = 50.0 lbs/day
Average weekly mass limit: 45 mg/L x 0.200 MGD x 8.34 = 75.1 lbs/day

Dissolved Oxygen (DO):

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(2).

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.

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 0.051 mg/L and an instantaneous maximum limit of 0.166 mg/L since 2/1/2017. Based on recent DMR data, the facility currently meets these limits. The existing limits will remain in the proposed permit.

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 phase IV, it will be required to monitor and report TP and TN 2/month. TN and TP "Monitor & Report" requirements will remain in the proposed permit.

Antidegradation (93.4)

The effluent limits for this discharge have been developed to ensure that existing in-stream water uses and the level of water quality necessary to protect the existing uses are maintained and protected. No High Quality Waters are impacted by this discharge. No Exceptional Value Waters are impacted by this discharge.

303d Listed Streams

eMap PA lists UNT Marsh Creek as impaired at the discharge point for "flow regime modification" due to small residential runoff and road runoff. A TMDL has not yet been developed.

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; one per week effluent 24-hr composite samples of $CBOD_5$, TSS, and Ammonia-Nitrogen; one per week effluent grab samples of Fecal Coliform; two per month effluent 24-hr composite samples of Nitrate-Nitrite as N, Total Kjeldahl Nitrogen, and TP; and two per month 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

Two nodes were incorporated in the modeling effort.

Node 1: Outfall 001 on UNT Marsh Creek

Elevation:	584 ft (USGS National Map Viewer)
Drainage Area:	1.71 $mi.^2$ (USGS PA StreamStats)
River Mile Index:	1.92 (PA DEP eMapPA)
Low Flow Yield:	0.052 $cfs/mi.^2$
Discharge Flow:	0.200 MGD (NPDES Application)

Node 2: Just before confluence with UNT Marsh Creek with Marsh Creek

Elevation:	539 ft (USGS National Map Viewer)
Drainage Area:	2.8 $mi.^2$ (USGS PA StreamStats)
River Mile Index:	0.001 (PA DEP eMapPA)
Low Flow Yield:	0.052 $cfs/mi.^2$
Discharge Flow:	0.000 MGD

Attachment is WQM 7.0 data.

PA American Water
WQM 7.0 data.pdf

TRC results.

TRC EVALUATION			
Input appropriate values in A3:A9 and D3:D9			
0.089	= Q stream (cfs)	0.5	= CV Daily
0.2	= 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 = 0.111	1.3.2.iii	WLA cfc = 0.100
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 0.041	5.1d	LTA_cfc = 0.058

Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AML MULT = 1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.051	AFC
		INST MAX LIMIT (mg/l) = 0.166	

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)**

Existing Effluent Limitations and Monitoring Requirements

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	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
DO	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine (8/1/2014 – 1/31/2017)	XXX	XXX	XXX	0.20	XXX	0.68	1/day	Grab
TRC (2/1/2017 – 1/31/2019)	XXX	XXX	XXX	0.051	XXX	0.166	1/day	Grab
BOD_5 Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	1/week	24-Hr Composite
TSS Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	1/week	24-Hr Composite
$CBOD_5$	41.7	66.7 Wkly Avg	XXX	25.0	40.0	50	1/week	24-Hr Composite
TSS	50.0	75.1 Wkly Avg	XXX	30.0	45.0	60	1/week	24-Hr Composite
Fecal Coliform (CFU/100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	1/week	Grab
Fecal Coliform (CFU/100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2,000 Geo Mean	XXX	10,000	1/week	Grab
Ammonia May 1 - Oct 31	4.2	XXX	XXX	2.5	XXX	5.0	1/week	24-Hr Composite
Ammonia Nov 1 - Apr 30	12.5	XXX	XXX	7.5	XXX	15	1/week	24-Hr Composite
Total Phosphorus	Report	XXX	XXX	Report	XXX	XXX	2/month	24-Hr Composite

Compliance Sampling Location:

Other Comments:

Existing Effluent Limitations and Monitoring Requirements, Cont.

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/week	24-Hr Composite
Kjeldahl--N	Report	XXX	XXX	Report	XXX	XXX	2/month	24-Hr Composite
Nitrate-Nitrite as N	Report	XXX	XXX	Report	XXX	XXX	2/month	24-Hr Composite
Total Nitrogen	Report	Report	XXX	Report	XXX	XXX	2/month	Calculation
Total Phosphorus	Report	Report	XXX	Report	XXX	XXX	2/month	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" (362-0400-001), SOPs and/or BPJ.

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	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
DO	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.051	XXX	0.166	1/day	Grab
BOD_5 Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	1/week	24-Hr Composite
TSS Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	1/week	24-Hr Composite
CBOD5	41.7	66.7 Wkly Avg	XXX	25.0	40.0	50	1/week	24-Hr Composite
TSS	50.0	75.1 Wkly Avg	XXX	30.0	45.0	60	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
Ammonia May 1 - Oct 31	4.2	XXX	XXX	2.5	XXX	5.0	1/week	24-Hr Composite
Ammonia Nov 1 - Apr 30	12.5	XXX	XXX	7.5	XXX	15	1/week	24-Hr Composite
Total Phosphorus	Report	XXX	XXX	Report	XXX	XXX	2/month	24-Hr Composite

Compliance Sampling Location:

Other Comments: Composite samples may be taken before or after disinfection; grab samples shall be taken after disinfection

Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (362-0400-001), SOPs and/or BPJ.

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Monthly	Annual	Monthly	Monthly Average	Maximum	Instant. Maximum		
Ammonia--N	Report	Report	XXX	XXX	XXX	XXX	1/week	24-Hr Composite
Kjeldahl--N	Report	XXX	XXX	Report	XXX	XXX	2/month	24-Hr Composite
Nitrate-Nitrite as N	Report	XXX	XXX	Report	XXX	XXX	2/month	24-Hr Composite
Total Nitrogen	Report	Report	XXX	Report	XXX	XXX	2/month	Calculation
Total Phosphorus	Report	Report	XXX	Report	XXX	XXX	2/month	24-Hr Composite

Compliance Sampling Location:

Other Comments:

Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment)
☐	PENTOXSD for Windows Model (see Attachment)
☒	TRC Model Spreadsheet (see Attachment)
☐	Temperature Model Spreadsheet (see Attachment)
☐	Toxics Screening Analysis Spreadsheet (see Attachment)
☒	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
☐	Technical Guidance for the Development and Specification of Effluent Limitations, 362-0400-001, 10/97.
☐	Policy for Permitting Surface Water Diversions, 362-2000-003, 3/98.
☐	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 362-2000-008, 11/96.
☐	Technology-Based Control Requirements for Water Treatment Plant Wastes, 362-2183-003, 10/97.
☐	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 362-2183-004, 12/97.
☐	Pennsylvania CSO Policy, 385-2000-011, 9/08.
☐	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
☐	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 391-2000-002, 4/97.
☒	Determining Water Quality-Based Effluent Limits, 391-2000-003, 12/97.
☒	Implementation Guidance Design Conditions, 391-2000-006, 9/97.
☒	Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 391-2000-007, 6/2004.
☐	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 391-2000-008, 10/1997.
☐	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 391-2000-010, 3/99.
☐	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 391-2000-011, 5/2004.
☒	Implementation Guidance for Section 93.7 Ammonia Criteria, 391-2000-013, 11/97.
☐	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 391-2000-014, 4/2008.
☐	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 391-2000-015, 11/1994.
☐	Implementation Guidance for Temperature Criteria, 391-2000-017, 4/09.
☒	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 391-2000-018, 10/97.
☐	Implementation Guidance for Application of Section 93.5(e) for Potable Water Supply Protection Total Dissolved Solids, Nitrite-Nitrate, Non-Priority Pollutant Phenolics and Fluorides, 391-2000-019, 10/97.
☐	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 391-2000-021, 3/99.
☐	Implementation Guidance for the Determination and Use of Background/Ambient Water Quality in the Determination of Wasteload Allocations and NPDES Effluent Limitations for Toxic Substances, 391-2000-022, 3/1999.
☐	Design Stream Flows, 391-2000-023, 9/98.
☐	Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 391-2000-024, 10/98.
☐	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 391-3200-013, 6/97.
☒	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
☐	SOP:
☐	Other: