pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0080039**
Facility Type	**Municipal**	APS ID	**15345**
Major / Minor	**Minor**	Authorization ID	**1254625**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Carroll Valley Sewer & Water Authority**	Facility Name	**Carroll Valley STP**
Applicant Address	5685 Fairfield Road	Facility Address	5685 Fairfield Road
	Fairfield, PA 17320-9611		Fairfield, PA 17320-9611
Applicant Contact	David Hazlett	Facility Contact	Jed Fetter
Applicant Phone	(717) 642-8269	Facility Phone	(717) 642-5571
Client ID	73610	Site ID	252221
Ch 94 Load Status	Not Overloaded	Municipality	Carroll Valley Borough
Connection Status	No Limitations	County	Adams
Date Application Received	November 19, 2018	EPA Waived?	Yes
Date Application Accepted	December 13, 2018	If No, Reason	
Purpose of Application	NPDES permit renewal.		

Summary of Review

Carroll Valley Sewer & Water Authority has applied to the Pennsylvania Department of Environmental Protection (DEP) for reissuance of its NPDES permit. The permit was last reissued on April 18, 2014 and became effective on May 1, 2014. The permit expired on April 30, 2019 but the terms and conditions of the permit have been extended since that time.

Carroll Valley Sewer & Water Authority owns, operates, and maintains the wastewater treatment plant located in Carroll Valley Borough, Adams County. The aeration secondary treatment plant discharges treated municipal wastewater to Toms Creek, which is classified for Cold Water Fishes (CWF). The collection system has 100% sewers from Carroll Valley Borough. The facility has a design average annual flow of 0.14 MGD.

WQM Part II No. 0102402 original was issued 1986, and 012402 A-1 amendment was issued 4/19/2002 to extensions of pumping stations.

Changes from the previous permit: Unit of Fecal Coliform changed from CFU/100 ml to No./100 ml. The Ammonia-Nitrogen (November 1 – April 30) limits requirements changed from “Report” to 29.7 lbs/day of monthly average, 25.5 mg/L of monthly average, and 51 mg/L of IMAX.

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. Any additional information or public review of documents associated with the discharge or the applicant may be available at the PA DEP Southcentral Regional Office (SCRO), 909 Elmerton Avenue, Harrisburg, PA 17110. To make an appointment for file reviews, contact the SCRO File Review Coordinator at 717.705.4700.

Approve	Deny	Signatures	Date
X		Hilary H. Le / Environmental Engineering Specialist	November 27, 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)	.14
Latitude	39º 45' 35.79"	Longitude	-77º 22' 57.15"
Quad Name	Iron Springs	Quad Code	
Wastewater Description:	Sewage Effluent		
Receiving Waters	Toms Creek (CWF)	Stream Code	58685
NHD Com ID	53321454	RMI	3.11 miles (PA border)
Drainage Area	12.4 mi.^{2}	Yield (cfs/mi^2)	0.086 cfs/mi.^{2}
Q_{7-10} Flow (cfs)	1.07	Q_{7-10} Basis	
Elevation (ft)	544	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	PATHOGENS		
Source(s) of Impairment	SOURCE UNKNOWN		
TMDL Status	Pending	Name	
Nearest Downstream Public Water Supply Intake	City of Frederick, MD		
PWS Waters	Monocacy River	Flow at Intake (cfs)	
PWS RMI		Distance from Outfall (mi)	Approximate 35 miles

Changes Since Last Permit Issuance: none

Drainage Area
The discharge is to Toms Creek at RMI 3.11 miles. A drainage area upstream of the discharge is estimated to be 12.4 mi.^{2}, according to USGS PA StreamStats available at https://streamstats.usgs.gov/ss/.

Stream Flow:
According to USGS StreamStats available at https://streamstats.usgs.gov/ss/ , the discharge point has a Q_{7-10} of 1.07 cfs and a drainage area of 12.4 mi.^{2}, which results in a Q_{7-10} low flow yield of 0.086 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):

Q_{7-10} = 1.07 cfs
Low Flow Yield = 1.07 cfs / 12.4 mi.^{2} ≈ 0.086 cfs/mi.^{2}
Q_{30-10} = 1.36 * 1.07 cfs ≈ 1.46 cfs
Q_{1-10} = 0.64 * 1.07 cfs ≈ 0.68 cfs

The resulting dilution ratio (under Q_{7-10} conditions) is: Q_{stream} / $Q_{discharge}$ = 1.07 cfs / [0.140 MGD * (1.55 cfs/MGD)] = 4.9:1

Public Water Supply:
There are no downstream public water supply intakes in Pennsylvania. According to the previous protection report, the nearest downstream public water supply intake is for the City of Frederick, Maryland on the Monocacy River, approximately 35 miles downstream of this discharge. Considering distance and dilution, the discharge is not expected to impact the water supply.

Treatment Facility Summary				
Treatment Facility Name: Carroll Valley - Main STP				
WQM Permit No.	**Issuance Date**			
0102402	1986			
0102402 A-1	4/19/2002			
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Secondary	Extended Aeration	Hypochlorite	0.14
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.14	337	Not Overloaded	Aerobic Digestion	Other WWTP

Changes Since Last Permit Issuance:

The WWTP train is as follows:

Bar Screen (1) ⇒ EQ Tanks (6) ⇒ Aeration Tanks (14) ⇒ Clarifiers (2) ⇒ Chlorine Contact Tanks (2) ⇒ Post Aeration Lagoon (1) ⇒ Discharge

The facility incorporates the chemical addition of liquid sodium hypochlorite (for disinfection). Sludge holding tanks are on-site.

Compliance History	
Summary of DMRs:	DMRs reported last 12 months from October 1, 2018 to September 30, 2019 are summarized in the Table below (Pages # 5 & 6).
Summary of Inspections:	10/17/2017: Mr. Bowen, DEP WQS, conducted compliance evaluation inspection. Effluent was clear. The field test results were within permitted limits. There were no violations 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 one instance of non-compliance (one exceedance of monthly average flow). The facility appears to be operating satisfactorily.

Other comments cont.

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

Influent Testing Results			*Effluent Testing Results*		
Parameter	**Min/Max Value**	**Average Value**	**Parameter**	**Min/Max Value**	**Average Value**
BOD_5 (mg/L)	400 mg/L	221.5 mg/L	pH (minimum)	6.6 S.U.	
BOD_5 (lbs/day)	472.4 lbs/day	219.3 lbs/day	pH (maximum)	8.3 S.U.	
TSS (mg/L)	450 mg/L	181.2 mg/L	D.O (minimum)	5.0 mg/L	7.9 mg/L
TSS (lbs/day)	457.9 lbs/day	185.4 lbs/day	TRC	0.0 mg/L	0.17 mg/L
TN (mg/L)	< 65.8 mg/L	< 65.8 mg/L	Fecal Coliform	462 No./100 mL	29.2 No./100 mL
TN (lbs/day)	< 50.5 lbs/day	< 50.5 lbs/day	$CBOD_5$	10 mg/L	3.2 mg/L
TP (mg/L)	6.4 mg/L	6.4 mg/L	TSS	14 mg/L	3.8 mg/L
TP (lbs/day)	4.9 lbs/day	4.9 lbs/day	NH_3-N	2.2 mg/L	1.7 mg/L
NH_3-N (mg/L)	32 mg/L	32 mg/L	TN	< 22.9 mg/L	< 22.9 mg/L
NH_3-N (lbs/day)	24.6 lbs/day	24.6 lbs/day	TP	3.9 mg/L	3.9 mg/L
TDS (mg/L)	1302 mg/L	1302 mg/L	Temp	No Data	No Data
TDS (lbs/day)	999.0 lbs/day	999.0 lbs/day	TKN	< 0.5 mg/L	< 0.5 mg/L
TKN	65 mg/L	65 mg/L	NO_2-N + NO_3-N	< 22.4 mg/L	< 22.4 mg/L
NO_2-N + NO_3-N	< 0.8 mg/L	< 0.8 mg/L	TDS	992 mg/L	992 mg/L
			Chloride	260 mg/L	260 mg/L
			Bromide	< 0.5 mg/L	< 0.5 mg/L
			Sulfate	49 mg/L	49 mg/L
			Oil and Grease	< 5.0 mg/L	< 5.0 mg/L
			Total Copper	0.032 mg/L	0.032 mg/L
			Total Lead	< 0.005 mg/L	< 0.005 mg/L
			Total Zinc	0.08 mg/L	0.08 mg/L

Compliance History

DMR Data for Outfall 001 (from October 1, 2018 to September 30, 2019)

Parameter	SEP-19	AUG-19	JUL-19	JUN-19	MAY-19	APR-19	MAR-19	FEB-19	JAN-19	DEC-18	NOV-18	OCT-18
Flow (MGD) Average Monthly	0.073	0.072	0.091	0.088	0.125	0.109	0.124	0.137	0.141	0.143	0.152	0.105
Flow (MGD) Daily Maximum	0.097	0.095	0.200	0.128	0.285	0.199	0.231	0.187	0.268	0.283	0.253	0.167
pH (S.U.) Minimum	7.2	7.2	7.0	7.3	7.1	7.1	7.3	7.1	7.0	7.0	7.1	7.4
pH (S.U.) Maximum	7.8	8.2	7.9	7.8	7.8	7.9	7.8	7.9	7.8	7.7	7.8	7.9
DO (mg/L) Minimum	6.6	6.2	5.2	6.0	5.8	6.1	7.0	6.2	7.4	6.1	6.2	5.7
TRC (mg/L) Average Monthly	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
TRC (mg/L) Instantaneous Maximum	0.17	0.32	0.31	0.16	0.21	0.32	0.42	0.37	0.24	0.37	0.4	0.21
CBOD5 (lbs/day) Average Monthly	< 2	< 2	< 2	< 2	< 3	< 3	< 2	< 3	< 4	< 3	< 5	< 3
CBOD5 (lbs/day) Weekly Average	< 2	2	< 2	< 2	< 4	3	3	4	5	< 3	< 6	< 3
CBOD5 (mg/L) Average Monthly	< 3	< 3	< 3	< 3	< 3	< 3	< 3	< 4	< 3	< 3	< 3	< 3
CBOD5 (mg/L) Weekly Average	3	3	3	< 3	3	3	3	4	3	3	< 3	< 3
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	147	125	151	259	183	137	149	193	398	121	158	182
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	174	152	174	338	190	147	182	243	581	140	180	203
BOD5 (mg/L) Raw Sewage Influent Average Monthly	257	223	230	390	185	158	202	214	411	130	102	211
TSS (lbs/day) Average Monthly	5	3	1	3	8	6	3	9	4	6	3	2
TSS (lbs/day) Raw Sewage Influent Average Monthly	110	107	121	154	139	139	91	112	221	82	175	169
TSS (lbs/day) Raw Sewage Influent Daily Maximum	161	171	184	225	195	172	95	158	224	94	193	176
TSS (lbs/day) Weekly Average	7	4	1	6	11	7	5	10	5	10	4	3
TSS (mg/L) Average Monthly	9	6	2	5	8	8	4	10	3	6	2	2

TSS (mg/L) Raw Sewage Influent Average Monthly	192	195	187	233	123	157	131	121	200	88	108	194
TSS (mg/L) Weekly Average	12	7	2	8	8	9	5	10	3	10	2	3
Fecal Coliform (CFU/100 ml) Geometric Mean	179	17	86	23	109	3	34	< 3	< 32	5	190	< 3
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	350	56	155	92	118	6	76	5	520	7	620	12
Nitrate-Nitrite (mg/L) Annual Average										< 15.4		
Nitrate-Nitrite (lbs) Total Annual										3515.94		
Total Nitrogen (mg/L) Annual Average										< 19.5		
Total Nitrogen (lbs) Total Annual										4452.0		
Ammonia (lbs/day) Average Monthly	< 3.6	< 0.2	< 0.07	< 3.1	0.1	2.1	2.8	21.0	< 0.2	< 0.09	< 0.2	< 2.1
Ammonia (mg/L) Average Monthly	< 0.21	< 0.33	< 0.11	< 4.5	< 0.11	2.5	3.32	23	< 0.12	< 0.1	< 0.1	< 2.4
TKN (mg/L) Annual Average										< 0.50		
TKN (lbs) Total Annual										114.15		
Total Phosphorus (mg/L) Annual Average										4.1		
Total Phosphorus (lbs) Total Annual										936.06		

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.14
Latitude 39º 45' 35.98" **Longitude** -77º 22' 57.32"
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. However, the existing limits of 25 mg/L monthly average (AML), 40mg/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 0.140 MGD x 8.34 = 29 lbs/day
Average weekly mass limit: 40 mg/L x 0.140 MGD x 8.34 = 46 lbs/day

Total Suspended Solids (TSS):
The existing technology-based limits of 30 mg/L average monthly, 45 mg/L average weekly, and 60 mg/L instantaneous maximum 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: 30 mg/L x 0.140 MGD x 8.34 = 35 lbs/day
Average weekly mass limit: 45 mg/L x 0.140 MGD x 8.34 = 52 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(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.

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

The model input data and results are attached. The printout of the WQM 7.0 output indicates that at a discharge of 0.140 MGD, limits (rounded according to the NPDES Technical Guidance 362-0400-001) of 14 mg/L NH_3-N as a monthly average and 28 mg/L NH_3-N instantaneous maximum are necessary to protect the aquatic life from toxicity effects. These limits are less stringent than the previous permit's due to the usage of a higher streamflow calculation. However, the existing summer limits of 8.5 mg/L and 17 mg/L will remain in the proposed permit due to anti-backsliding requirements. Mass limits are calculated as follows:

Summer average monthly mass limit: 8.5 mg/L x 0.140 MGD x 8.34 = 9.9 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 25.5 mg/L (8.5 mg/L x 3). For the same reason, the instantaneous maximum limit for the winter season will be 51 mg/L (17 mg/L x 3). Recent DMRs and inspection reports indicate that these limits are being attained easily.

Winter average monthly mass limit: 9.9 lbs/day x 3 = 29.7 lbs/day

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.

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, and will be required to monitor and report TP and TN once a year.

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 Chapter 94.12 and assess percent removal requirements, per DEP policy.

Biosolids Management:
Digested sludge is periodically removed and dewatered by a contractor with a mobile belt filter press prior to final disposal in a landfill.

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 receiving stream has a tentative impairment for pathogens from an unknown source. The tentative impairment was created on November 20, 2012.

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 $CBOD_5$, TSS, and Ammonia-Nitrogen; two per month effluent grab samples of Fecal Coliform; annually effluent 8-hr composite samples of Nitrate-Nitrite as N, Total Kjeldahl Nitrogen, and TP; and annually 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 Tom's Creek (58685)

Elevation:	544 ft (USGS National Map Viewer)
Drainage Area:	12.4 $mi.^2$ (USGS PA StreamStats)
River Mile Index:	3.11 (PA DEP eMapPA)
Low Flow Yield:	0.086 $cfs/mi.^2$
Discharge Flow:	0.140 MGD (NPDES Application)

Node 2: Just before confluence with UNT 58767

Elevation:	498 ft (USGS National Map Viewer)
Drainage Area:	13.0 $mi.^2$ (USGS PA StreamStats)
River Mile Index:	2.29 (PA DEP eMapPA)
Low Flow Yield:	0.086 $cfs/mi.^2$
Discharge Flow:	0.000 MGD

Attachment is WQM 7.0 data.

carroll valley WQM 7.0 data.pdf

TRC Results

TRC EVALUATION			
Input appropriate values in A3:A9 and D3:D9			
1.07	= Q stream (cfs)	0.5	= CV Daily
0.14	= 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 = 1.595	1.3.2.iii	WLA cfc = 1.547
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 0.594	5.1d	LTA_cfc = 0.900

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)**

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	Total Annual	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	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
$CBOD_5$	29	46 Wkly Avg	XXX	25	40	50	2/month	8-Hr Composite
BOD_5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Total Suspended Solids	35	52 Wkly Avg	XXX	30	45	60	2/month	8-Hr Composite
Fecal Coliform (CFU/100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	2/month	Grab
Fecal Coliform (CFU/100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2,000 Geo Mean	XXX	10,000	2/month	Grab
Ammonia-Nitrogen May 1 - Oct 31	9.9	XXX	XXX	8.5	XXX	17	2/month	8-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	Report	XXX	XXX	Report	XXX	Report	2/month	8-Hr Composite
Nitrate-Nitrite as N (lbs/year)	XXX	Report	XXX	Report Annl Avg	XXX	XXX	1/year	8-Hr Composite
Total Kjeldahl Nitrogen (lbs/year)	XXX	Report	XXX	Report Annl Avg	XXX	XXX	1/year	8-Hr Composite
Total Phosphorus (lbs/year)	XXX	Report	XXX	Report Annl Avg	XXX	XXX	1/year	8-Hr Composite
Total Nitrogen (lbs/year)	XXX	Report	XXX	Report Annl Avg	XXX	XXX	1/year	Calculation

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
D.O.	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
$CBOD_5$	29.0	46.0 Wkly Avg	XXX	25.0	40.0	50	2/month	8-Hr Composite
BOD_5 Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	2/month	8-Hr Composite
TSS Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	2/month	8-Hr Composite
TSS	35.0	52.0 Wkly avg	XXX	30.0	45.0	60	2/month	8-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2,000 Geo Mean	XXX	10,000	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	2/month	Grab
Ammonia May 1 - Oct 31	9.9	XXX	XXX	8.5	XXX	17	2/month	8-Hr Composite
Ammonia Nov 1 - Apr 30	29.7	XXX	XXX	25.5	XXX	51	2/month	8-Hr Composite
Nitrate-Nitrite as N (lbs/year)	XXX	Report Total Annual	XXX	Report Annl Avg	XXX	XXX	1/year	8-Hr Composite
TKN (lbs/year)	XXX	Report Total Annual	XXX	Report Annl Avg	XXX	XXX	1/year	8-Hr Composite
Total Phosphorus (lbs/year)	XXX	Report Total Annual	XXX	Report Annl Avg	XXX	XXX	1/year	8-Hr Composite
Total Nitrogen (lbs/year)	XXX	Report Total Annual	XXX	Report Annl Avg	XXX	XXX	1/year	Calculation

Compliance Sampling Location:

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: