

Application Type

Renewal

Facility Type

Non-Municipal

Major / Minor

Minor

Application No.

PA0111601

APS ID

275184

Authorization ID

1442770

**NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE**

Applicant and Facility Information

Applicant Name	Christian Retreat Center	Facility Name	Christian Retreat Center STP
Applicant Address	369 CRC Drive	Facility Address	369 CRC Drive
	East Waterford, PA 17021-9981		East Waterford, PA 17021-7083
Applicant Contact	Zachary Bashore	Facility Contact	Zachary Bashore
Applicant Phone	(717) 734-3627	Facility Phone	(717) 734-3627
Client ID	56854	Site ID	251640
Ch 94 Load Status	Not Overloaded	Municipality	Lack Township
Connection Status	No Limitations	County	Juniata
Date Application Received	June 5, 2023	EPA Waived?	Yes
Date Application Accepted	July 25, 2023	If No, Reason	
Purpose of Application	Renewal of existing NPDES permit		

Summary of Review

The Christian Retreat Center (CRC) has applied to the Pennsylvania Department of Environmental Protection (DEP) for reissuance of its NPDES permit. The permit was last reissued to CRC on September 28, 2018. The permit expired on September 30, 2023 but the terms and conditions of the permit have been administratively extended since that time.

Based on the review outlined in this fact sheet, it is recommended that the permit be drafted and a notice of the draft permit be published in the *Pennsylvania Bulletin* for public comments for 30 days. A file review of documents associated with the discharge or permittee 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.

Sludge use and disposal description and location(s): Not identified in application

Public Participation

DEP will publish notice of the receipt of the NPDES permit application and a tentative decision to issue the individual NPDES permit in the *Pennsylvania Bulletin* in accordance with 25 Pa. Code § 92a.82. Upon publication in the *Pennsylvania Bulletin*, DEP will accept written comments from interested persons for a 30-day period (which may be extended for one additional 15-day period at DEP's discretion), which will be considered in making a final decision on the application. Any person may request or petition for a public hearing with respect to the application. A public hearing may be held if DEP determines that there is significant public interest in holding a hearing. If a hearing is held, notice of the hearing will be published in the *Pennsylvania Bulletin* at least 30 days prior to the hearing and in at least one newspaper of general circulation within the geographical area of the discharge.

Approve	Deny	Signatures	Date
x		Aaron Baar Aaron Baar / Project Manager	July 10, 2024
x		Maria D. Bebenek for Daniel W. Martin, P.E. / Environmental Engineer Manager	July 17, 2024

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	001	Design Flow (MGD)	.016
Latitude	40° 22' 9.30"	Longitude	-77° 37' 26.03"
Quad Name	Blair Mills	Quad Code	1624
Wastewater Description:	Sewage Effluent		
Receiving Waters	Tuscarora Creek (CWF)	Stream Code	11830
NHD Com ID	66209657	RMI	29.5
Drainage Area	92.8	Yield (cfs/mi ²)	0.0464
Q ₇₋₁₀ Flow (cfs)	4.31	Q ₇₋₁₀ Basis	USGS StreamStats
Elevation (ft)	617.5	Slope (ft/ft)	
Watershed No.	12-B	Chapter 93 Class.	CWF
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	Newport Borough Water Authority		
PWS Waters	Juniata River	Flow at Intake (cfs)	21,100 cfs
PWS RMI	13.1	Distance from Outfall (mi)	48.1

Changes Since Last Permit Issuance: No changes since the last issuance of the CRC's NPDES permit.

Drainage Area

The discharge is to Tuscarora Creek at RMI 29.5. A drainage area upstream of the discharge is determined to be 92.8 sq.mi. according to USGS PA StreamStats available at <https://streamstats.usgs.gov/ss/>.

Stream Flow

According to StreamStats, the watershed has a Q₇₋₁₀ of 4.31 cfs. This information was used to obtain a LFY, a chronic 30-day (Q₃₀₋₁₀) and acute (Q₁₋₁₀) exposure stream flows for the discharge point as follows (Guidance No. 391-2000-023).

$$\begin{aligned}
 Q_{7-10} &= 4.31 \text{ cfs} \\
 Q_{30-10} &= 1.36 * 4.31 \text{ cfs} = 5.86 \text{ cfs} \\
 Q_{1-10} &= 0.64 * 4.31 \text{ cfs} = 2.76 \text{ cfs} \\
 \text{LFY} &= 4.31 \text{ cfs} / 92.8 \text{ mi}^2 = 0.0464 \text{ cfs/mi}^2
 \end{aligned}$$

Tuscarora Creek

25 Pa Code §93.9 classifies the receiving water, Tuscarora Creek, with a CWF Existing Use designation. No special protection waters are impacted by this discharge. The discharge is in a stream segment listed as attaining use in the 2024 Integrated Report. 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.

Local Watershed Total Maximum Daily Loads (TMDLs)

According to PA's 2024 Integrated Water Quality Monitoring and Assessment Report, Tuscarora Creek in the vicinity of the point of discharge is supporting aquatic life and listed as Category 2, indicating that Tuscarora Creek is a water

where some but not all uses are met. The assessment status of the remaining uses may be unknown because data are insufficient to assess the water, or it may be impaired.

Public Water Supply Intake

The nearest downstream public water supply intake is the Newport Borough Water Authority intake located on the Juniata River approximately 13 miles from the discharge. Considering the distance and nature, the discharge is not expected to significantly affect the water supply.

Class A Wild Trout Streams

The receiving stream is not a Class A Wild Trout stream; therefore, no Class A Wild Trout Fishery is impacted by this discharge.

Treatment Facility Summary				
Treatment Facility Name: Christian Retreat Center Camp				
WQM Permit No.	Issuance Date			
UNK	UNK			
Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary	Extended Aeration	Hypochlorite	0.016
Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.016	UNK	Not Overloaded	Aerobic Digestion	Other WWTP

CRC owns and operates the sanitary wastewater treatment facility located in Lack Township, Juniata County. The facility only serves the Christian Retreat Center, all wastes are residential in nature, and all sewer systems are 100% separated. With having both annual average design flow and hydraulic design capacity of 0.016 MGD, this facility utilizes an extended aeration system consisting of a comminutor, bar screen, EQ tank, aeration tank, clarifier, chlorine contact tank, and outfall structure to Tuscarora Creek. The facility utilizes a sludge holding tank. An unidentified form of chlorine is used for disinfection.

Compliance History	
Summary of DMRs:	DMR results for the past year are presented below.
Summary of Inspections:	Since the last renewal of the facility's NPDES permit, the following inspections have been logged: May 20, 2020: An administrative inspection was conducted via phone by Michael Benham. No violations were noted. . October 21, 2021: A CEI was conducted by Brandon Bettinger. No violations were noted. Recommendations were made to utilize a NIST traceable thermometer to verify temperature in the sample fridge, and to ensure biosolids production disposal info is submitted on the correct form.

Other Comments: As of July 10, 2024, there are no open violations associated with this facility.

Existing Effluent Limitations and Monitoring Requirements

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) ⁽¹⁾		Concentrations (mg/L)				Minimum ⁽²⁾ Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	5.0 Inst Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
CBOD5	XXX	XXX	XXX	25.0	XXX	50	2/month	8-Hr Composite
TSS	XXX	XXX	XXX	30.0	XXX	60	2/month	8-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/month	Grab
Nitrate-Nitrite	XXX	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Nitrate-Nitrite (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
Total Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	1/month	Calculation
Total Nitrogen (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
Ammonia Nov 1 - Apr 30	XXX	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Ammonia May 1 - Oct 31	XXX	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Ammonia (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
TKN	XXX	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
TKN (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) ⁽¹⁾		Concentrations (mg/L)				Minimum ⁽²⁾ Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Maximum	Instant. Maximum		
Total Phosphorus	XXX	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Total Phosphorus (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation

Compliance Sampling Location: Outfall 001

Existing Effluent Limitations and Monitoring Requirements

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) ⁽¹⁾		Concentrations (mg/L)				Minimum ⁽²⁾ Measurement Frequency	Required Sample Type
	Monthly	Annual	Monthly	Monthly Average	Maximum	Instant. Maximum		
Total Nitrogen (lbs)	XXX	Report Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation
Ammonia (lbs)	XXX	Report Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation
Total Phosphorus (lbs)	XXX	Report Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation

Compliance Sampling Location: Outfall 001

Compliance History

DMR Data for Outfall 001 (from June 1, 2023 to May 31, 2024)

Parameter	MAY-24	APR-24	MAR-24	FEB-24	JAN-24	DEC-23	NOV-23	OCT-23	SEP-23	AUG-23	JUL-23	JUN-23
Flow (MGD) Average Monthly	0.00159	0.00099	0.00106	0.00109	0.00125	0.00099	0.00083	0.00121		0.00211	0.00332	0.00261
Flow (MGD) Daily Maximum	0.0075	0.0025	0.0035	0.005	0.00675	0.003	0.0025	0.004		0.005	0.009	0.0075
pH (S.U.) Instantaneous Minimum	6.9	6.8	6.9	7.0	7.0	6.9	6.8	6.9		6.9	6.8	6.9
pH (S.U.) Instantaneous Maximum	7.3	7.5	7.4	7.4	7.4	7.3	7.3	8.2		7.3	7.2	7.3
DO (mg/L) Instantaneous Minimum	7.4	8.1	8.1	7.9	8.0	7.7	7.4	6.4		6.9	5.3	7.9
TRC (mg/L) Average Monthly	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.4		0.3	0.3	0.3
TRC (mg/L) Instantaneous Maximum	0.6	0.7	0.6	0.6	0.6	0.4	0.5	1.1		0.5	0.5	0.6
CBOD5 (mg/L) Average Monthly	6.2	6.0	8.7	< 3.2	4.0	< 2.4	2.4	5.6		21.8	< 3.0	< 2.0
CBOD5 (mg/L) Instantaneous Maximum	9.51	8.76	12.1	4.43	5.0	2.76	2.54	8.4		41.1	3.96	< 2.0
TSS (mg/L) Average Monthly	8.5	7.8	< 2.3	3.5	1.8	3.0	3.5	7.0		3.8	3.0	3.0
TSS (mg/L) Instantaneous Maximum	13.0	10.5	3.5	4.5	2.0	4.5	4.0	7.5		5.5	3.5	3.5
Fecal Coliform (No./100 ml) Geometric Mean	< 2.0	144	< 22	< 3	< 4	< 2	< 15	68		47	122	< 9
Fecal Coliform (No./100 ml) Instantaneous Maximum	4	576	470	8	14	3	214	78		136	185	78
Nitrate-Nitrite (mg/L) Average Monthly	2.07	< 1.09	< 1.19	2.21	< 4.99	< 24.1	16.45	< 5.37		< 32.8	< 32.9	< 38.21

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Christian Retreat Center

NPDES Permit No. PA0111601

Nitrate-Nitrite (lbs)											
Total Monthly	0.2	< 0.2	< 0.3	0.2	< 1.0	< 3	2	< 0.4		17	< 57
Total Nitrogen (mg/L)											
Average Monthly	12.33	< 2.89	< 5.6	8.9	< 8.33	< 26.56	2	< 6.59		< 35.71	< 34.6
Total Nitrogen (lbs)											
Total Monthly	1.0	< 0.6	< 0.9	0.8	< 2.0	< 3	2	< 0.5		< 19	< 60.0
Total Nitrogen (lbs)									< 113		
Total Annual											
Ammonia (lbs/day)											
Average Monthly	0.02	< 0.009	0.01	0.01	0.02	< 0.003	< 0.009	< 0.002		< 0.06	< 0.03
Ammonia (mg/L)											
Average Monthly	6.3	< 1.2	2.7	4.5	2.3	< 0.8	< 3.1	< 0.7		< 2.7	< 0.5
Ammonia (lbs)											
Total Monthly	0.5	< 0.3	0.3	0.4	0.6	< 0.08	< 0.3	< 0.05		< 2.0	< 0.8
Ammonia (lbs)									< 9		
Total Annual											
TKN (mg/L)											
Average Monthly	10.26	1.8	4.41	6.69	3.35	2.46	4.44	< 1.22		< 2.907	1.75
TKN (lbs)											
Total Monthly	0.8	0.4	0.6	0.6	0.8	0.3	0.4	0.1		< 2.0	3.0
Total Phosphorus (lbs/day)											
Average Monthly	0.002	0.005	0.005	0.004	0.007	0.007	0.005	0.004		0.06	0.2
Total Phosphorus (mg/L)											
Average Monthly	0.891	0.758	0.864	1.167	0.908	1.97	1.808	1.69		3.22	3.59
Total Phosphorus (lbs)											
Total Monthly	0.07	0.1	0.2	0.1	0.2	0.2	0.2	0.1		2.0	6.0
Total Phosphorus (lbs)									11		
Total Annual											

Development of Effluent Limitations

Outfall No. 001
Latitude 40° 22' 9.30"
Wastewater Description: Sewage Effluent

Design Flow (MGD) .016
Longitude -77° 37' 26.08"

Technology-Based Limitations

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

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

Comments: These standards apply, subject to water quality analysis and BPJ where applicable.

Water Quality-Based Limitations

CBOD₅, NH₃-N and Dissolved Oxygen (DO)

WQM 7.0 version 1.0b is a water quality model designed to assist DEP to determine appropriate permit requirements for CBOD₅, NH₃-N and DO. DEP's guidance no. 391-2000-007 provides the technical methods contained in WQM 7.0 for conducting wasteload allocation and for determining recommended NPDES effluent limits for point source discharges. The model was utilized, and the model output indicated that existing monitoring and reporting requirements for ammonia and an existing WQBEL for CBOD₅ of 25.0 mg/L are still protective of water quality.

A minimum of 5.0 mg/L for DO is an existing effluent limit and will remain unchanged in the draft permit as recommended by DEP's SOP. This requirement has also been assigned to other sewage facilities in the region. 5.0 mg/L is taken directly from 25 Pa. Code § 93.7(a) and it is also determined to be appropriate according to water quality modeling.

Total Residual Chlorine

Since chlorine is used for disinfection, Total Residual Chlorine (TRC) effluent levels must be regulated in accordance with 25 Pa Code §92a.48(b). DEP's TRC_CALC worksheet is utilized to determine if the existing BAT TBEL is still appropriate. The worksheet indicates that the existing limits of 0.5 mg/L (average monthly) and 1.6 mg/L (IMAX) are still protective of water quality.

Toxics

DEP's NPDES permit application for minor sewages (less than 0.1 MGD) does not require sampling for heavy metals including Total Copper, Total Lead, and Total Zinc.

Best Professional Judgment (BPJ) Limitations

Total Phosphorus & Total Nitrogen

DEP's SOP no. BPNPSM-PMT-033 recommends monitoring requirements for Total Phosphorus and Total Nitrogen for all sewage facilities. Therefore, a routine monitoring for TKN, Nitrate-Nitrite, and TN are recommended to be continued in this permit as previously permitted.

Additional Considerations

Flow Monitoring

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

E. Coli Monitoring

In conformity with the Department's *Establishing Effluent Limitations for Individual Sewage Permits* (SOP No. BCW-PMT-033) and as authorized by § 92a.61 of the PA Code, annual E. Coli monitoring has been proposed in this permit. The collection method will be via grab sample.

Chesapeake Bay TMDL

The Department formulated a strategy in April 2007, to comply with the EPA's and Chesapeake Bay Foundation's requirements to reduce point source loadings of Total Nitrogen (TN) and Total Phosphorus (TP) to the Bay. In the Strategy, sewage dischargers have been prioritized by Central Office based on their delivered TN loadings to the Bay. The highest priority (Phases 1, 2, and 3) dischargers received 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. Phase 4 (0.2 -0.4mgd) and Phase 5 (below 0.2mgd) facilities were required to monitor and report TN and TP during permit renewal at a monitoring frequency following Table 6-3 of DEP's Technical Guidance for Development and Specification of effluent Limitations (No. 362-0400-001).

EPA published the Chesapeake Bay Total Maximum Daily Load (TMDL) in December of 2010. Despite extensive restoration efforts during the past 25 years, the TMDL was prompted by insufficient progress and continued poor water quality in the Chesapeake Bay and its tidal tributaries.

In order to address the TMDL, Pennsylvania developed, in addition to the Bay Strategy, a Chesapeake Watershed Implementation Plan (WIP) Phase 1 in January 2011, Phase 2 in March 2012 and Phase 3 in December 2019. In accordance with the Phase 3 WIP, re-issuing permits for significant dischargers follow the same phased approach formulated in the original Bay strategy, whilst Phase 4 and Phase 5 will be required to monitor and report TN and TP during permit renewal.

The Phase 3 WIP categorizes this facility as a phase 5 non-significant sewage facility that has a design flow less than 0.2 MGD but greater than 0.002 MGD. The WIP recommends monitoring and reporting for Total Nitrogen and Total Phosphorus throughout the permit term at a frequency no less than annual. As discussed previously, twice monthly testing of these pollutants is proposed in this permit.

Monitoring Frequency and Sample Type

Unless discussed otherwise above, the permit's monitoring frequency and sample type for all parameters will remain unchanged from the last permit renewal.

Antidegradation Requirements

All effluent limitations and monitoring requirements have been developed to ensure that existing instream water uses and the level of water quality necessary to protect the existing uses are maintained and protected.

Anti-backsliding Requirement

All effluent limits proposed in this fact sheet are as stringent as effluent limits specified in the existing permit renewal. This approach is in accordance with 40 CFR §122.44(l)(1).

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	Average Weekly	Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	5.0 Inst Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
CBOD5	XXX	XXX	XXX	25.0	XXX	50	2/month	8-Hr Composite
TSS	XXX	XXX	XXX	30.0	XXX	60	2/month	8-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/month	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/year	Grab
Nitrate-Nitrite	XXX	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Nitrate-Nitrite (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
Total Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	1/month	Calculation
Total Nitrogen (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
Ammonia Nov 1 - Apr 30	XXX	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite

Outfall 001, Continued (from Permit Effective Date through Permit Expiration Date)

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) ⁽¹⁾		Concentrations (mg/L)				Minimum ⁽²⁾ Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Maximum	Instant. Maximum		
Ammonia May 1 - Oct 31	XXX	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Ammonia (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
TKN	XXX	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
TKN (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
Total Phosphorus	XXX	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Total Phosphorus (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation

Compliance Sampling Location: Outfall 001

Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (386-0400-001), SOPs and/or BPJ.

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) ⁽¹⁾		Concentrations (mg/L)				Minimum ⁽²⁾ Measurement Frequency	Required Sample Type
	Monthly	Annual	Monthly	Monthly Average	Maximum	Instant. Maximum		
Total Nitrogen (lbs)	XXX	Report Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation
Ammonia (lbs)	XXX	Report Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation
Total Phosphorus (lbs)	XXX	Report Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation

Compliance Sampling Location: Outfall 001

Tools and References Used to Develop Permit	
<input checked="" type="checkbox"/>	WQM for Windows Model (see Attachment [REDACTED])
<input type="checkbox"/>	Toxics Management Spreadsheet (see Attachment [REDACTED])
<input checked="" type="checkbox"/>	TRC Model Spreadsheet (see Attachment [REDACTED])
<input type="checkbox"/>	Temperature Model Spreadsheet (see Attachment [REDACTED])
<input type="checkbox"/>	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
<input checked="" type="checkbox"/>	Technical Guidance for the Development and Specification of Effluent Limitations, 386-0400-001, 10/97.
<input type="checkbox"/>	Policy for Permitting Surface Water Diversions, 386-2000-019, 3/98.
<input type="checkbox"/>	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 386-2000-018, 11/96.
<input type="checkbox"/>	Technology-Based Control Requirements for Water Treatment Plant Wastes, 386-2183-001, 10/97.
<input type="checkbox"/>	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 386-2183-002, 12/97.
<input type="checkbox"/>	Pennsylvania CSO Policy, 386-2000-002, 9/08.
<input type="checkbox"/>	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
<input type="checkbox"/>	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 386-2000-008, 4/97.
<input checked="" type="checkbox"/>	Determining Water Quality-Based Effluent Limits, 386-2000-004, 12/97.
<input type="checkbox"/>	Implementation Guidance Design Conditions, 386-2000-007, 9/97.
<input type="checkbox"/>	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.
<input type="checkbox"/>	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 386-2000-012, 10/1997.
<input type="checkbox"/>	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 386-2000-009, 3/99.
<input type="checkbox"/>	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 386-2000-015, 5/2004.
<input type="checkbox"/>	Implementation Guidance for Section 93.7 Ammonia Criteria, 386-2000-022, 11/97.
<input type="checkbox"/>	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 386-2000-013, 4/2008.
<input type="checkbox"/>	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 386-2000-011, 11/1994.
<input type="checkbox"/>	Implementation Guidance for Temperature Criteria, 386-2000-001, 4/09.
<input type="checkbox"/>	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 386-2000-021, 10/97.
<input type="checkbox"/>	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.
<input type="checkbox"/>	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 386-2000-005, 3/99.
<input type="checkbox"/>	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.
<input type="checkbox"/>	Design Stream Flows, 386-2000-003, 9/98.
<input type="checkbox"/>	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.
<input type="checkbox"/>	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 386-3200-001, 6/97.
<input type="checkbox"/>	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
<input type="checkbox"/>	SOP: [REDACTED]
<input type="checkbox"/>	Other: [REDACTED]



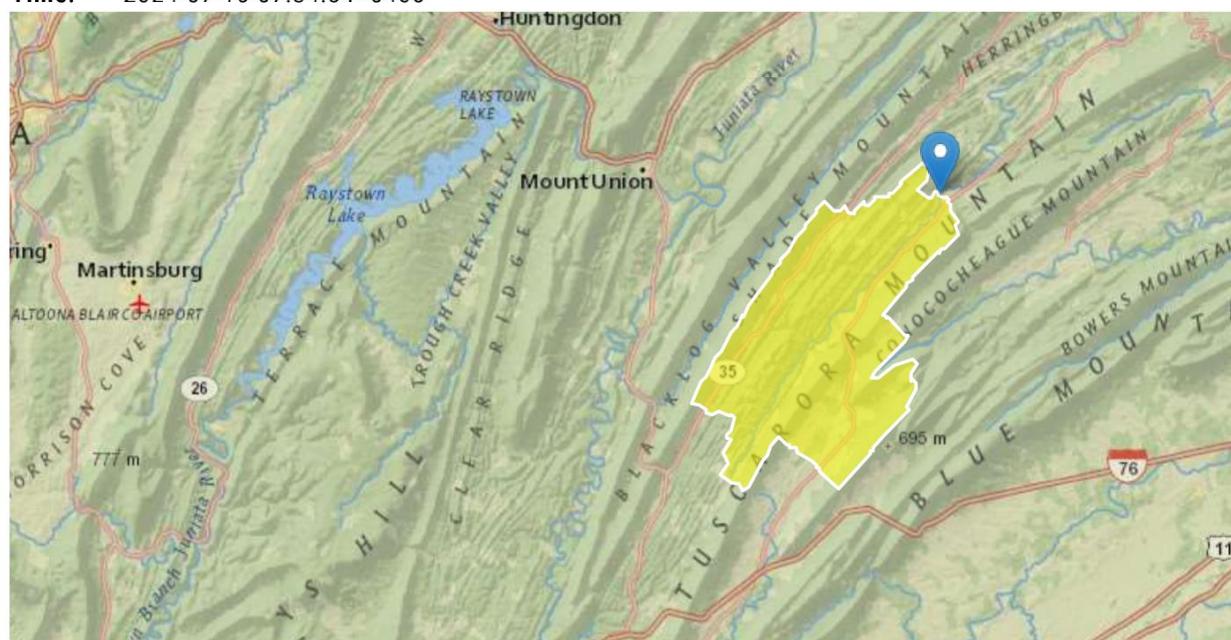
StreamStats Report

Region ID: PA

Workspace ID: PA20240710113433150000

Clicked Point (Latitude, Longitude): 40.36821, -77.62375

Time: 2024-07-10 07:34:54 -0400



[Collapse All](#)

➤ Basin Characteristics

Parameter	Parameter Description	Value	Unit
CARBON	Percentage of area of carbonate rock	14.27	percent
DRNAREA	Area that drains to a point on a stream	92.8	square miles
PRECIP	Mean Annual Precipitation	39	inches
ROCKDEP	Depth to rock	4.2	feet
STRDEN	Stream Density -- total length of streams divided by drainage area	2.14	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	92.8	square miles	4.93	1280
PRECIP	Mean Annual Precipitation	39	inches	35	50.4
STRDEN	Stream Density	2.14	miles per square mile	0.51	3.1
ROCKDEP	Depth to Rock	4.2	feet	3.32	5.65
CARBON	Percent Carbonate	14.27	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 (other -- see report)

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	8.85	ft^3/s	38	38
30 Day 2 Year Low Flow	11.8	ft^3/s	33	33
7 Day 10 Year Low Flow	4.31	ft^3/s	51	51
30 Day 10 Year Low Flow	5.86	ft^3/s	46	46
90 Day 10 Year Low Flow	8.89	ft^3/s	36	36

Low-Flow Statistics Citations

Stuckey, M.H., 2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p.
(<http://pubs.usgs.gov/sir/2006/5130/>)

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Application Version: 4.21.0

StreamStats Services Version: 1.2.22

NSS Services Version: 2.2.1

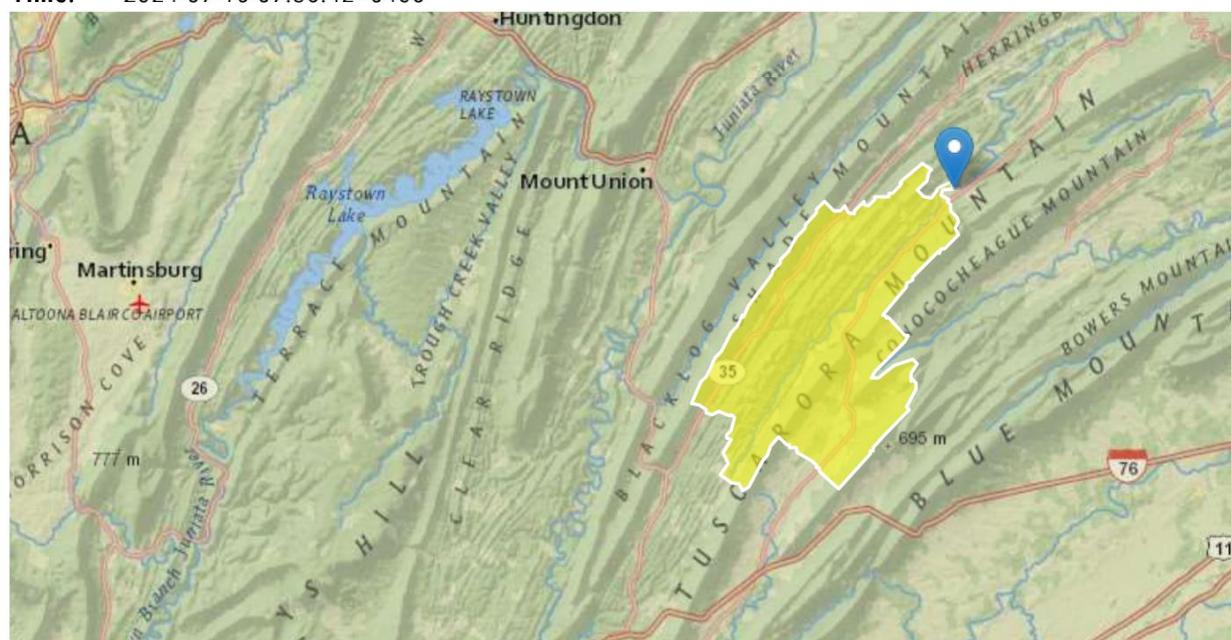
StreamStats Report

Region ID: PA

Workspace ID: PA20240710113620762000

Clicked Point (Latitude, Longitude): 40.37202, -77.61137

Time: 2024-07-10 07:36:42 -0400



[Collapse All](#)

➤ Basin Characteristics

Parameter	Parameter Description	Value	Unit
CARBON	Percentage of area of carbonate rock	14.24	percent
DRNAREA	Area that drains to a point on a stream	93	square miles
PRECIP	Mean Annual Precipitation	39	inches
ROCKDEP	Depth to rock	4.2	feet
STRDEN	Stream Density -- total length of streams divided by drainage area	2.15	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	93	square miles	4.93	1280
PRECIP	Mean Annual Precipitation	39	inches	35	50.4
STRDEN	Stream Density	2.15	miles per square mile	0.51	3.1
ROCKDEP	Depth to Rock	4.2	feet	3.32	5.65
CARBON	Percent Carbonate	14.24	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 (other -- see report)

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	8.83	ft^3/s	38	38
30 Day 2 Year Low Flow	11.8	ft^3/s	33	33
7 Day 10 Year Low Flow	4.3	ft^3/s	51	51
30 Day 10 Year Low Flow	5.84	ft^3/s	46	46
90 Day 10 Year Low Flow	8.86	ft^3/s	36	36

Low-Flow Statistics Citations

Stuckey, M.H., 2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p.
(<http://pubs.usgs.gov/sir/2006/5130/>)

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Application Version: 4.21.0

StreamStats Services Version: 1.2.22

NSS Services Version: 2.2.1

WQM 7.0 Effluent Limits

SWP Basin		Stream Code	Stream Name				
12B		11830	TUSCARORA 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)
29.500	CRC	PA0111601	0.016	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			5

WQM 7.0 Wasteload Allocations

<u>SWP Basin</u>		<u>Stream Code</u>	<u>Stream Name</u>				
12B	11830	TUSCARORA 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
29.500	CRC	16.7	50	16.7	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
29.500	CRC	1.88	25	1.88	25	0	0
Dissolved Oxygen Allocations							
RMI	Discharge Name	<u>CBOD5</u>		<u>NH3-N</u>		<u>Dissolved Oxygen</u>	
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)
29.500	CRC	25	25	25	25	5	5
						0	0

WQM 7.0 D.O.Simulation

<u>SWP Basin</u>	<u>Stream Code</u>	<u>Stream Name</u>	
12B	11830	TUSCARORA CREEK	
<u>RMI</u> 29.500	<u>Total Discharge Flow (mgd)</u> 0.016	<u>Analysis Temperature (°C)</u> 20.029	<u>Analysis pH</u> 7.000
<u>Reach Width (ft)</u> 36.956	<u>Reach Depth (ft)</u> 0.704	<u>Reach WDRatio</u> 52.496	<u>Reach Velocity (fps)</u> 0.167
<u>Reach CBOD5 (mg/L)</u> 2.13	<u>Reach Kc (1/days)</u> 0.080	<u>Reach NH3-N (mg/L)</u> 0.14	<u>Reach Kn (1/days)</u> 0.702
<u>Reach DO (mg/L)</u> 8.224	<u>Reach Kr (1/days)</u> 4.009	<u>Kr Equation</u> Tsivoglou	<u>Reach DO Goal (mg/L)</u> 6
<u>Reach Travel Time (days)</u> 0.334	Subreach Results		
	TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)
		0.033	2.13
		0.067	2.12
		0.100	2.11
		0.134	2.11
		0.167	2.10
		0.200	2.10
		0.234	2.09
		0.267	2.09
		0.300	2.08
		0.334	2.08
			D.O. (mg/L)
			0.14
			8.24
			0.14
			8.24
			0.13
			8.24
			0.13
			8.24
			0.12
			8.24
			0.12
			8.24
			0.11
			8.24

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	<input checked="" type="checkbox"/>
WLA Method	EMPR	Use Inputted W/D Ratio	<input type="checkbox"/>
Q1-10/Q7-10 Ratio	0.64	Use Inputted Reach Travel Times	<input type="checkbox"/>
Q30-10/Q7-10 Ratio	1.36	Temperature Adjust Kr	<input checked="" type="checkbox"/>
D.O. Saturation	90.00%	Use Balanced Technology	<input checked="" type="checkbox"/>
D.O. Goal	6		

WQM 7.0 Hydrodynamic Outputs

<u>SWP Basin</u>			<u>Stream Code</u>			<u>Stream Name</u>						
12B			11830			TUSCARORA CREEK						
RMI	Stream Flow	PWS With	Net Stream Flow	Disc Analysis	Reach Slope	Depth	Width	W/D Ratio	Velocity	Reach Trav Time	Analysis Temp	Analysis pH
	(cfs)	(cfs)	(cfs)	(cfs)	(ft/ft)	(ft)	(ft)		(fps)	(days)	(°C)	
Q7-10 Flow												
29.500	4.31	0.00	4.31	.0248	0.00253	.704	36.96	52.5	0.17	0.334	20.03	7.00
Q1-10 Flow												
29.500	2.76	0.00	2.76	.0248	0.00253	NA	NA	NA	0.13	0.428	20.04	7.00
Q30-10 Flow												
29.500	5.86	0.00	5.86	.0248	0.00253	NA	NA	NA	0.20	0.281	20.02	7.00

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		
12B	11830	TUSCARORA CREEK			29.500	617.50	92.80	0.00000	0.00	<input checked="" type="checkbox"/>		
Stream Data												
Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Stream pH (°C)		
Q7-10	0.100	0.00	4.31	0.000	0.000	0.0	0.00	0.00	20.00	7.00		
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				
	CRC	PA0111601	0.0160	0.0160	0.0160	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							

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
12B	11830	TUSCARORA CREEK			28.590	605.34	93.00	0.00000	0.00	<input checked="" type="checkbox"/>
Stream Data										
Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Stream Temp (°C)
Q7-10 0.100 0.00 4.30 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	
0.0000 0.0000 0.0000 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 3.00 8.24 0.00 0.00 NH3-N 25.00 0.00 0.00 0.70										

TRC_CALC

1A	B	C	D	E	F	G				
2 TRC EVALUATION										
3 Input appropriate values in B4:B8 and E4:E7										
4	4.31	= Q stream (cfs)		0.5	= CV Daily					
5	0.016	= Q discharge (MGD)		0.5	= CV Hourly					
6	30	= no. samples		1	= AFC_Partial Mix Factor					
7	0.3	= Chlorine Demand of Stream		1	= CFC_Partial Mix Factor					
8	0	= Chlorine Demand of Discharge		15	= AFC_Criteria Compliance Time (min)					
9	0.5	= BAT/BPJ Value		720	= CFC_Criteria Compliance Time (min)					
	0	= % Factor of Safety (FOS)			=Decay Coefficient (K)					
10	Source	Reference	AFC Calculations	Reference	CFC Calculations					
11	TRC	1.3.2.iii	WLA_afc = 55.566	1.3.2.iii	WLA_cfc = 54.165					
12	PENTOXSD TRG	5.1a	LTAMULT_afc = 0.373	5.1c	LTAMULT_cfc = 0.581					
13	PENTOXSD TRG	5.1b	LTA_afc= 20.705	5.1d	LTA_cfc = 31.489					
14										
15	Source	Effluent Limit Calculations								
16	PENTOXSD TRG	5.1f	AML MULT = 1.231							
17	PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.500			BAT/BPJ				
18			INST MAX LIMIT (mg/l) = 1.635							
19										
20	WLA_afc	$(.019/e(-k*AFC_tc)) + [(AFC_Yc*Qs*.019/Qd*e(-k*AFC_tc))...\\...+ Xd + (AFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)$								
21	LTAMULT_afc	$EXP((0.5*LN(cvh^2+1))-2.326*LN(cvh^2+1)^0.5)$								
22	LTA_afc	$wla_afc*LTAMULT_afc$								
23	WLA_cfc	$(.011/e(-k*CFC_tc)) + [(CFC_Yc*Qs*.011/Qd*e(-k*CFC_tc))...\\...+ Xd + (CFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)$								
24	LTAMULT_cfc	$EXP((0.5*LN(cvd^2/no_samples+1))-2.326*LN(cvd^2/no_samples+1)^0.5)$								
25	LTA_cfc	$wla_cfc*LTAMULT_cfc$								
26	AML MULT	$EXP(2.326*LN((cvd^2/no_samples+1)^0.5)-0.5*LN(cvd^2/no_samples+1))$								
27	AVG MON LIMIT	$MIN(BAT_BPJ,MIN(LTA_afc,LTA_cfc)*AML_MULT)$								
28	INST MAX LIMIT	$1.5*((av_mon_limit/AML_MULT)/LTAMULT_afc)$								