pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0253227**
Facility Type	**Municipal**	APS ID	**1088167**
Major / Minor	**Minor**	Authorization ID	**1439133**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**East Franklin Township Armstrong County**	Facility Name	**Adrian STP**
Applicant Address	106 Cherry Orchard Avenue Kittanning, PA 16201-3310	Facility Address	630 Adrian Reesedale Rd Adrian, PA 16210
Applicant Contact	Barry Peters	Facility Contact	Same as Applicant
Applicant Phone	(724) 548-2310	Facility Phone	Same as Applicant
Client ID	77287	Site ID	665636
Ch 94 Load Status	**Not Overloaded**	Municipality	East Franklin Township
Connection Status	**No Restrictions**	County	Armstrong
Date Application Received	May 1, 2023	EPA Waived?	Yes
Date Application Accepted		If No, Reason	

Purpose of Application: Renewal of an NPDES Permit for the Discharge of Treated Sewage.

Summary of Review

The applicant has applied for a renewal of NPDES Permit No. PA0253227. NDPES Permit No. PA0253227 was previously issued by the PA Department of Environmental Protection on February 1, 2019. The permit will expire on January 31, 2024.

WQM Permit No. 0309404, issued on September 14, 2009, authorized the construction of the plant to treat an average design flow of 0.018 MGD. The existing treatment process is extended aeration, clarification, and chlorine disinfection. The STP went online in summer of 2011

Act 14 – Notification was submitted and received.

The permittee currently submits their Discharge Monitoring Reports through DEP's eDMR system.

The receiving stream, Limestone Run, is currently classified as a WWF and is located in State Watershed 17-E.

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		Dustin Hargenrater Dustin Hargenrater / Civil Engineer Trainee	February 1, 2024
		Vacant / Environmental Engineer Manager	Okay to Draft JCD 2/9/2024

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	.018
Latitude	40º 53' 3.00"	Longitude	-79º 32' 12"
Quad Name	East Brady	Quad Code	40079H5
Wastewater Description:	Sewage Effluent		

Receiving Waters	Limestone Run (WWF)	Stream Code	47105
NHD Com ID	123857513	RMI	2.95
Drainage Area	3.98	Yield (cfs/mi^2)	.0308
Q_{7-10} Flow (cfs)	.12	Q_{7-10} Basis	Default
Elevation (ft)	992	Slope (ft/ft)	.01061
Watershed No.	17-E	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use	None	Exceptions to Criteria	None
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment			
Source(s) of Impairment			
TMDL Status	Final	Name	Limestone Run

Background/Ambient Data		Data Source
pH (SU)	8.20	Sample ID 1534327 from 09/07/2010
Temperature (°F)	77	Default WWF
Hardness (mg/L)		
Other:		

Nearest Downstream Public Water Supply Intake		Kitanning Suburban Joint Water Authority	
PWS Waters	Allegheny River	Flow at Intake (cfs)	987
PWS RMI	45.6	Distance from Outfall (mi)	4.07

Changes Since Last Permit Issuance: Nearest Downstream Public Water Supply Intake has been updated to most recent data.

Treatment Facility Summary				
Treatment Facility Name: Adrian STP				
WQM Permit No.	**Issuance Date**			
0309404	09/14/2009			
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Secondary	Extended Aeration	Chlorination	0.002
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.045	36.0	Not Overloaded	Aerated Holding Tank	Allegheny Valley Joint Sewage Authority

Changes Since Last Permit Issuance: Change in Biosolids Use/Disposal to the Allegheny Valley Joint Municipal Authority.

Compliance History	
Summary of DMRs:	All DMR's submitted in eDMR system have been submitted in a timely fashion. There are currently 11 issues of non-compliance for the effluent within the permit period. **-March 2019: TSS Monthly Average** reported value of **33 mg/l**, permit limit **30 mg/l**. Cause of Non-Compliance is listed as "Sludge bulking problems". Corrective Action taken was "Other." External Comments: "Wasting could not be properly performed because of the weather conditions." **-April 2020: Total Residual Chlorine (TRC) Monthly Average** reported value of **.62 mg/l**, permit limit **.5 mg/l**. Cause of Non-Compliance is listed as "Other". Corrective Action taken was "Other." External Comments: "I believe the TRC average was increased because of the inconsistent weather we had in the month of April. We will try to be more observant of the weather conditions." **-June 2020: Total Residual Chlorine (TRC) Monthly Average** reported value of **.78 mg/l**, permit limit **.5 mg/l**. Cause of Non-Compliance listed as "Insufficient/overdose chemical feed". Corrective Action taken was "Increased chemical feed." No external comments made. -**June 2020: Fecal Coliform Instantaneous Maximum** reported value **1414 No./100 ml**, permit limit **1000 No./100 ml**. Cause of Non-Compliance listed as "Insufficient/overdose chemical feed." Corrective Action taken was "Increased chemical feed." External Comments: "Temperatures have been very high this month." -**July 2020: Total Residual Chlorine (TRC) Average Monthly** reported value **.51 mg/l**, permit limit **.5 mg/l**. Cause of Non-Compliance listed as "Insufficient/overdose chemical feed." Corrective Action taken was "Increased chemical feed." No external comments were made. -**February 2021: CBOD5 Monthly Average** reported value **29.25 mg/l**, permit limit **25 mg/l**. Cause of Non-Compliance listed as "Extreme Temperatures". Corrective Action taken was "Other." External Comments: "I try to do as much wasting as I can when the weather is good." -**February 2021: TSS Average Monthly** reported value **88 mg/l**, permit limit **30 mg/l**. Cause of Non-Compliance listed as "Extreme Temperatures." Corrective Action taken was "Other." External Comments: "I try to do as much wasting as I can when the weather is good." -**February 2021: TSS Instantaneous Maximum** reported value **104 mg/l**, permit **limit 60 mg/l**. Cause of Non-Compliance listed as "Extreme Temperatures." Corrective Action taken was "Other." External Comments: "I try to do as much wasting as I can when the weather is good." -**January 2023: TSS Average Monthly** reported value **40 mg/l**, permit limit **30 mg/l**. Cause of Non-Compliance listed as "Extreme Temperatures." Corrective Action taken was "Other." External Comments: "Will do more wasting." -**February 2023: TSS Average Monthly** reported value **54 mg/l**, permit limit **30 mg/l**. Cause of Non-Compliance is listed as "Extreme Temperatures." Corrective Action taken was "Other." External Comments: "I will try to do as much wasting as possible when the weather is warmer." -**February 2023: TSS Instantaneous Maximum** reported value **74 mg/l**, permit limit **60 mg/l**. Cause of Non-Compliance is listed as "Extreme Temperatures." Corrective Action taken was "Other." External Comments: "I will try to do as much wasting as possible when the weather is warmer."

	There is currently one issue of other permit non-compliance for the period of June 2016 for "Sample collection less frequent than required." The sampling point was Raw Sewage Influent and the parameter was BOD5.
Summary of Inspections:	There are 3 inspections that have been completed in the permit term. **Inspection ID:** 2939493 **Inspected Date:** 05/07/2019 **Type of Inspection:** Chapter 94 Inspection **Inspection Result:** No Violations Noted **Inspector:** Bruce Leidy **Inspection ID:** 2995158 **Inspected Date:** 02/10/2020 **Type of Inspection:** Compliance Evaluation **Inspection Result:** No Violations Noted **Inspector:** Bruce Leidy **Inspection ID:** 3550330 **Inspected Date:** 05/08/2023 **Type of Inspection:** Chapter 94 Inspection **Inspection Result:** No Violations Noted **Inspector:** Clinton Stonesifer

Other Comment:
There are no chronic or significant violations based on DMR data. There are 3 violations in the last two years none of which have a parameter with two or more times the limit.

Compliance History

DMR Data for Outfall 001 (from April 1, 2022 to March 31, 2023)

Parameter	MAR-23	FEB-23	JAN-23	DEC-22	NOV-22	OCT-22	SEP-22	AUG-22	JUL-22	JUN-22	MAY-22	APR-22
Flow (MGD) Average Monthly	0.001	0.003	0.002	0.002	0.002	0.003	0.002	0.002	0.002	0.002	0.002	0.002
pH (S.U.) Daily Minimum	7.27	6.97	7.06	7.09	7.08	7.07	7.36	7.36	7.38	6.68	7.28	7.30
pH (S.U.) Daily Maximum	7.48	7.36	7.55	7.56	7.59	7.77	7.78	8.04	7.91	7.78	7.76	8.16
DO (mg/L) Daily Minimum	10.06	10.05	10.07	10.10	10.00	10.10	10.07	9.88	9.87	9.90	9.86	10.09
TRC (mg/L) Average Monthly	0.13	0.15	0.14	0.17	0.15	0.15	0.16	0.20	0.16	0.19	0.18	0.22
TRC (mg/L) Instantaneous Maximum	0.21	0.21	0.19	0.20	0.22	0.22	0.22	0.27	0.21	0.29	0.26	0.58
CBOD5 (lbs/day) Average Monthly	0.09	0.18	0.24	0.05	< 0.06	< 0.04	< 0.03	< 0.06	< 0.03	< 0.04	< 0.06	< 0.05
CBOD5 (mg/L) Average Monthly	7.35	10.25	14	4.40	< 3	< 3.00	< 3.0	< 3.0	< 3.00	< 3.00	< 4.05	< 3
CBOD5 (mg/L) Instantaneous Maximum	7.50	13.60	15.80	5.80	< 3	< 3.00	< 3.0	< 3.0	< 3.00	< 3.00	5.10	< 3
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	3.36	5.40	5.28	2.74	3.89	4.00	2.86	4.99	5.91	1.73	2.88	3.74
BOD5 (mg/L) Raw Sewage Influent Daily Maximum	281.00	240.00	226	235	259.00	240.00	264	341.00	506.00	138	182.00	204
TSS (lbs/day) Average Monthly	0.18	0.93	0.77	< 0.09	< 0.06	0.05	0.04	< 0.06	< 0.04	< 0.07	< 0.07	0.06
TSS (lbs/day) Raw Sewage Influent Daily Maximum	4.89	7.39	8.03	1.10	6.46	7.34	3.40	7.86	3.13	1.65	2.30	3.82
TSS (mg/L) Average Monthly	13	54	40	< 8	< 4	4	4	< 3	< 4	< 6	< 5	4
TSS (mg/L) Instantaneous Maximum	21	74	58	13	4	4	4	< 3	4	8	6	4

TSS (mg/L) Raw Sewage Influent Daily Maximum	414	328	344	94	430	440	314	322	268	124	172	208
Fecal Coliform (No./100 ml) Geometric Mean	< 1	1	< 13	5	< 3	7	174	169	< 1	< 1	< 2	16
Fecal Coliform (No./100 ml) Instantaneous Maximum	< 1	1	< 152	5	6	19	614	191	< 1	1	4	33
Total Nitrogen (mg/L) Daily Maximum				36.9								
Ammonia (lbs/day) Average Monthly	0.04	0.11	0.11	< 0.01	< 0.01	< 0.01	0.01	< 0.01	0.01	0.01	< 0.01	< 0.01
Ammonia (mg/L) Average Monthly	3.24	6.24	6.63	< 0.28	0.17	< 0.14	0.63	< 0.11	0.59	1.12	0.30	0.32
Ammonia (mg/L) Instantaneous Maximum	3.43	7.26	7.87	0.45	0.17	0.18	0.87	0.11	0.67	2.01	0.42	0.44
Total Phosphorus (mg/L) Daily Maximum				10.06								

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** .018
Latitude 40º 53' 3.00" **Longitude** -79º 32' 12.00"
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)
E. Coli	Report	IMAX	-	92a.61
Total Residual Chlorine	0.5	Average Monthly	-	92a.48(b)(2)

Water Quality-Based Limitations

The discharge was modeled using WQM 7.0 to evaluate the CBOD5, Ammonia-Nitrogen, and Dissolved Oxygen parameters. The modeling results show technology based effluent limitations for CBOD5 are appropriate. The modeling results also confirm that Ammonia-Nitrogen and Dissolved Oxygen limitations are necessary to meet in-stream water quality criterion. The modeling suggests a 11.58 mg/L monthly limit with a 23.16 mg/L IMAX concentration. Using the Round-Off Guidelines in the Technical Guidance for the Development and Specification of Effluent Limitations these values will translate to 11.5 mg/L monthly limit and 23.0 mg/L IMAX limit. The Ammonia-Nitrogen parameter will have two per month testing frequency and limited to 1.70 lbs/month loading limit and 11.5 mg/L monthly average concentration with a 23.0 mg/L instantaneous maximum concentration for the months of May through September. Based on the SOP for Establishing Effluent Limitations in Sewage Permits, Ammonia-Nitrogen is subject to a seasonal multiplier of 3 times the summertime average monthly limit. This is consistent with the modeling to meet in-stream water quality criterion. A compliance schedule will not be issued for Ammonia-Nitrogen as the facility already meets this limit more than 75% of the time. The Total Suspended Solids, pH, Fecal Coliform, or Total Residual Chlorine parameters are not evaluated using WQM 7.0. The basis for the proposed technology-based limitations are listed in the above table. WQM 7.0 and TRC_CALC output files are attached to this Fact Sheet.

Best Professional Judgment (BPJ) Limitations

Based on the modeling a 4.0 mg/L Dissolved Oxygen limitation would be appropriate. Given that the limitation set forth in Title 25 Chapter 93 for Dissolved Oxygen in Warm Water Fishes waters is a minimum of 5.0 mg/L, the more stringent of the two will be used. A Dissolved Oxygen minimum limitation of 5.0 mg/L will be implemented based on the standard in 25 PA Code Chapter 93.7 and best professional judgement.

Anti-Backsliding

N/A

Additional Considerations

Mass loading limits are imposed for publicly owned treatment works. Current policy requires average monthly mass loading limits will be established for CBOD5, TSS, and NH_3-N and average weekly mass loading limits be established for CBOD5 and TSS.

For POTWs with design flows greater than 2,000 GPD, influent BOD_5 and TSS monitoring will be established in the permit.

For existing discharges, if an average monthly warm period limit of 25 mg/l is acceptable, a year-round monitoring requirement for ammonia-nitrogen, at a minimum should be established. The monitoring requirements for Ammonia Nitrogen are consistent with CBOD5, TSS, and Fecal Coliform.

Monitoring frequency for the proposed effluent limits are based upon Table 6-3, Self-Monitoring Requirements for Sewage Dischargers, from the Departments Technical Guidance for the Development and Specification of Effluent Limitations

Nutrient monitoring is required to establish the nutrient load from the wastewater treatment facility and the impacts that load may have on the quality of the receiving stream(s). Sewage dischargers with design flows > 2,000 gpd require monitoring at a minimum for Total Nitrogen and Total Phosphorous in new and reissued permits. A monitoring frequency of once per year is considered acceptable. The receiving stream for this facility, Limestone Run, is currently impaired by Organic Enrichment with the cause being listed as On-Site Treatment Systems (Septic systems and similar decentralized systems). This delineation was made in 2002 and the treatment system came online in 2009. In the impairment delineation report the inspector noted that there was a strong odor of sewage and wildcat sewers coming from the stormwater system and it is believed that the Adrian STP was put in to replace the wildcat sewers and septic systems in hopes to get the stream back to ambient conditions. After taking a look at the sampling that was submitted for Total Nitrogen and Total Phosphorous with a stream biologist, he confirmed that the concentration of these parameters was not a concern. Additionally, the main stem of Limestone Run approximately 1 mile down stream was more recently tested (2009/2012) and listed as impaired for trash with the cause being unknown, notes within the biologists survey indicated an illegal garbage dump could be contributing to the impairment with no mention of impacts linked to the Adrian STP. Based on Table 6-3, Self-monitoring Requirements for Sewage Dischargers, from the Departments Technical Guidance for the Development and Specification of Effluent Limits the facility will be subject to 2/month testing for Total Phosphorous. Total Nitrogen will be subject to once a month testing, this parameter is not listed in Table 6-3 Self-monitoring Requirements for Sewage Dischargers. Two testing samples were reported on the renewal application with an average concentration of 27.35 mg/L and a min/max concentration of 36.9 mg/L. With additional testing done on Total Nitrogen it would more appropriately model what the system is discharging and further show that the facility is not causing or contributing to an in-stream impairment.

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	Average Weekly	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	XXX	XXX	XXX	XXX	XXX	2/month	Measured
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	9.0	XXX	5/week	Grab
DO	XXX	XXX	5.0 Daily Min	5.5 Wkly Avg	XXX	XXX	5/week	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.6	5/week	Grab
CBOD5	3.8	XXX	XXX	25	XXX	50	2/month	Grab
TSS	4.5	XXX	XXX	30	XXX	60	2/month	Grab
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	Report	XXX	1/year	Grab
Total Nitrogen	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Ammonia (lbs/mo) Oct 1 - Apr 30	5.1	XXX	XXX	34.5	XXX	69.0	2/month	Grab
Ammonia (lbs/mo) May 1 - Sep 30	1.7	XXX	XXX	11.5	XXX	23.0	2/month	Grab
Total Phosphorus	XXX	XXX	XXX	XXX	Report	XXX	2/month	Grab

Compliance Sampling Location: Outfall 001, after disinfection.

WQM Modeling – Data Collection Information

RMI 3.115
Stream Data:
-Yield calculated taking Q7-10 flow divided by drainage area (USGS – StreamStats)
-Stream Temp of 25 degrees Celsius: Default WWF
-Stream pH: Average concentration of pH from 4 tests conducted at monitoring point ID 61150 (1.11 Miles upstream)
-Sample ID 1907332 (9/3/2014) pH: 7.4
-Sample ID 1789422 (7/15/2013) pH: 7.5
-Sample ID 2117647 (3/16/2017) pH: 7.3
-Sample ID 1659740 (1/18/2012) pH: 7.0
Discharge Data:
-Existing Discharge Flow: 0.018 MGD pulled from application
-Discharge Temp: Default 20 degrees Celsius
-Discharge pH:

Date	pH min	pH max	10^ -pH min	10^ -pH max	& pH max)	-Log (Ave pH)
Sep-23	7.26	7.6	5.49541E-08	2.51189E-08	4.00365E-08	**7.4**
Aug-23	7.36	8.3	4.36516E-08	5.01187E-09	2.43317E-08	**7.6**
Jul-23	7.3	8.16	5.01187E-08	6.91831E-09	2.85185E-08	**7.5**
Jun-23	7.4	8.09	3.98107E-08	8.12831E-09	2.39695E-08	**7.6**
Sep-22	7.36	7.78	4.36516E-08	1.65959E-08	3.01237E-08	**7.5**
Aug-22	7.36	8.04	4.36516E-08	9.12011E-09	2.63858E-08	**7.6**
Jul-22	7.38	7.91	4.16869E-08	1.23027E-08	2.69948E-08	**7.6**
Jun-22	6.68	7.78	2.0893E-07	1.65959E-08	1.12763E-07	**6.9**
Sep-21	7.07	7.66	8.51138E-08	2.18776E-08	5.34957E-08	**7.3**
21-Aug	7.16	7.57	6.91831E-08	2.69153E-08	4.80492E-08	**7.3**
21-Jul	7.19	8.16	6.45654E-08	6.91831E-09	3.57419E-08	**7.4**
21-Jun	7.06	8.6	8.70964E-08	2.51189E-09	4.48041E-08	**7.3**
20-Sep	7.38	8.4	4.16869E-08	3.98107E-09	2.2834E-08	**7.6**
20-Aug	8.07	8.45	8.51138E-09	3.54813E-09	6.02976E-09	**8.2**
20-Jul	7.93	8.32	1.1749E-08	4.7863E-09	8.26764E-09	**8.1**
					Average:	**7.5**

-D.O. Trib Conc: 7.54 mg/L Based on input from peers for WWF Waters
-D.O. Goal: 5.0 mg/L Based on input from peers for WWF Waters

RMI 0.00
Stream Data:
-Yield Calculated by dividing the Q7-10 flow by the drainage area
-Stream Temp of 25 degrees Celsius: Default WWF
-Stream pH: Average concentration of pH from 7 tests conducted at Monitoring Point ID 11382 (Located at RMI 1.27)
    -Sample ID 2406404 (1/21/21): 7.8
    -Sample ID 1667447 (2/23/2012): 7.9
    -Sample ID 1603051 (6/30/2011): 8
    -Sample ID 2034630 (4/13/2016): 8.1
    -Sample ID 2297658 (5/7/2019): 7.9
    -Sample ID 1790701 (7/23/2013): 8.2
    -Sample ID 2350424 (1/6/2020): 7.6
-D.O. Trib Conc: 7.54 mg/L Based on input from peers for WWF Waters

TRC_CALC

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

0.12	= Q stream (cfs)	0.5	= CV Daily
0.018	= Q discharge (MGD)	0.5	= CV Hourly
24	= 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 = 1.394	1.3.2.iii	WLA cfc = 1.351
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 0.519	5.1d	LTA_cfc = 0.786

Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AML MULT = 1.261	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.500	BAT/BPJ
		INST MAX LIMIT (mg/l) = 1.597	

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)**

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
17E	47105	LIMESTONE RUN	**3.115**	990.00	5.90	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.030	0.00	0.00	0.000	0.000	0.0	0.00	0.00	25.00	7.30	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
Adrian STP	PA0253327	0.0180	0.0180	0.0180	0.000	20.00	7.50

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	4.00	7.54	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
17E	47105	LIMESTONE RUN	**0.000**	790.00	10.30	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.030	0.00	0.00	0.000	0.000	0.0	0.00	0.00	25.00	7.93	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	7.30

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	7.54	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
17E	47105	LIMESTONE RUN

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Reach Trav Time (days)	Analysis Temp (°C)	Analysis pH
Q7-10 Flow												
3.115	0.18	0.00	0.18	.0278	0.01216	.402	8.09	20.14	0.06	3.023	24.32	7.32
Q1-10 Flow												
3.115	0.11	0.00	0.11	.0278	0.01216	NA	NA	NA	0.05	3.724	24.01	7.33
Q30-10 Flow												
3.115	0.24	0.00	0.24	.0278	0.01216	NA	NA	NA	0.07	2.597	24.48	7.32

WQM 7.0 Modeling Specifications

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

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
17E	47105	LIMESTONE RUN

NH3-N Acute Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
3.115	Adrian STP	8.37	42.42	8.37	42.42	0	0

NH3-N Chronic Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
3.115	Adrian STP	1.2	11.58	1.2	11.58	0	0

Dissolved Oxygen Allocations

RMI	Discharge Name	CBOD5		NH3-N		Dissolved Oxygen		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
3.12	Adrian STP	25	25	11.58	11.58	4	4	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
17E	47105	LIMESTONE RUN

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
3.115	0.018	24.320	7.322
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
8.092	0.402	20.137	0.063
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
5.13	0.255	1.57	0.976
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.059	20.366	Owens	5
Reach Travel Time (days)			
3.023			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.302	4.67	1.17	7.54
0.605	4.25	0.87	7.54
0.907	3.87	0.65	7.54
1.209	3.52	0.48	7.54
1.511	3.20	0.36	7.54
1.814	2.91	0.27	7.54
2.116	2.65	0.20	7.54
2.418	2.41	0.15	7.54
2.720	2.20	0.11	7.54
3.023	2.00	0.08	7.54

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
17E	47105	LIMESTONE RUN

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)
3.115	Adrian STP	PA0253327	0.018	CBOD5	25		
				NH3-N	11.58	23.16	
				Dissolved Oxygen			4