pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0035556**
Facility Type	**Non-Municipal**	APS ID	**1011242**
Major / Minor	**Minor**	Authorization ID	**1305356**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**PA DOT Maintenance & Operations Bureau**	Facility Name	**PA DOT Rest Area 16**
Applicant Address	400 North Street, Floor 6 Harrisburg, PA 17120	Facility Address	I-79 Southbound, Exit 113 Grove City, PA 16127
Applicant Contact	Nicholaus Sahd	Facility Contact	Roderick Donghia, Contract Operator
Applicant Phone	(717) 951-8685	Facility Phone	(724) 813-8838
Client ID	189304	Site ID	453431
Ch 94 Load Status	Not Overloaded	Municipality	Plain Grove Township
Connection Status	No Limitations	County	Lawrence County
Date Application Received	January 31, 2020	EPA Waived?	Yes
Date Application Accepted	February 14, 2020	If No, Reason	-
Purpose of Application	Renewal of a non-Municipal minor NPDES Permit for an existing discharge of treated sanitary wastewater from a PA DOT rest area.		

Summary of Review

Act 14 - Proof of Notification was submitted and received.

A Part II Water Quality Management permit is not required at this time.

The applicant should be able to continue to meet the limits of this permit, which will continue to protect the uses of the receiving stream.

I. OTHER REQUIREMENTS:

A. Stormwater into sewers
B. Right of way
C. Solids handling
D. Public Sewerage Availability
E. Effluent Chlorine Optimization and Minimization

SPECIAL CONDITIONS:

II. Solids Management

The Permittee has requested that the expiration date for this NPDES Permit be the same as the Rest Area 16 nearby.

There are 19 open violations in efacts for Client ID 189304 as of 1/8/2021 (see Attachment 4).

Approve	Deny	Signatures	Date
X		Stephen A. McCauley Stephen A. McCauley, E.I.T. / Environmental Engineering Specialist	1/8/2021
X		Justin C. Dickey Justin C. Dickey, P.E. / Environmental Engineer Manager	1/14/2021

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.008
Latitude	41º 05' 59.00"	Longitude	-80º 08' 37.70"
Quad Name	-	Quad Code	-
Wastewater Description:	Sewage Effluent		
Receiving Waters	Unnamed Tributary to the Jamison Run	Stream Code	N/A
NHD Com ID	126222156	RMI	N/A
Drainage Area	0.0694	Yield (cfs/mi^2)	0.13
Q_{7-10} Flow (cfs)	0.009	Q_{7-10} Basis	calculated
Elevation (ft)	1259	Slope (ft/ft)	0.01872
Watershed No.	20-C	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	-

Background/Ambient Data		Data Source
pH (SU)	-	-
Temperature (°F)	-	-
Hardness (mg/L)	-	-
Other:	-	-

Nearest Downstream Public Water Supply Intake	Pennsylvania American Water Company - Ellwood City		
PWS Waters	Slippery Rock Creek	Flow at Intake (cfs)	53.1
PWS RMI	0.1	Distance from Outfall (mi)	23.5

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.

Narrative: This Fact Sheet details the determination of draft NPDES permit limits for an existing discharge of 0.008 MGD of treated sewage from an existing minor non-Municipal rest area in Plain Grove Township, Lawrence County.

Treatment permitted under Sewerage Permit No. 3793404 consists of the following: Extended aeration, sand filtration, and tablet chlorination.

1. Streamflow:

The yieldrate for the Unnamed Tributary to the Jamison Run was calculated from the drainage area and the Q_{7-10} low flow of the nearest gage station:

Slippery Rock Creek @ Wertemburg, PA:	Drainage Area:	398	sq. mi.	(from StreamStats)
gage number 03016500 (1976-1996)	Q_{7-10}:	52.1	cfs	(from StreamStats)
	Yieldrate:	0.13	cfsm	(calculated)
Unnamed Tributary to the Jamison Run:	Yieldrate:	0.13	cfsm	(calculated above)
(at Outfall 001)	Drainage Area:	0.0694	sq. mi.	(from StreamStats)
	Q_{7-10}:	0.009	cfs	(calculated)

2. Wasteflow: Outfall 001

Maximum discharge: 0.008 MGD = 0.012 cfs

Runoff flow period: 16 hours Basis: Runoff flow for a rest stop

24 hour flow: 0.012 cfs x 24/16 = 0.018 cfs

Flow will be required to be monitored as authorized under Chapter 92a.61, and as recommended in the SOP.

3. Parameters:

The following parameters were evaluated: pH, Total Suspended Solids, Fecal Coliform, Phosphorus, NH_3-N, $CBOD_5$, Dissolved Oxygen, and Total Residual Chlorine. NH_3-N, $CBOD_5$, and Dissolved Oxygen were evaluated using WQM 7.0 at the discharge point.

NO_2-NO_3, Fluoride, Phenolics, Sulfates, and Chlorides can be evaluated using PentoxSD at the nearest downstream potable water supply (PWS). Since there is significant dilution available, no modeling was performed for this facility.

a. pH

Between 6.0 and 9.0 at all times

Basis: Application of Chapter 93.7 technology-based limits. The measurement frequency was increased from 5/week to 1/day as recommended in the SOP, based on Table 6-3 in the "Technical Guidance for the Development and Specification of Effluent Limitations" (362-0400-001).

b. Total Suspended Solids

Limits are 30 mg/l as a monthly average and 60 as a daily maximum.

Basis: Application of Chapter 92a47 technology-based limits

c. Fecal Coliform

05/01 - 09/30:	200/100ml	(monthly average geometric mean)
	1,000/100ml	(instantaneous maximum)
10/01 - 04/30:	2,000/100ml	(monthly average geometric mean)
	10,000/100ml	(instantaneous maximum)

Basis: Application of Chapter 92a.47 technology-based limits.

d. Phosphorus

☐ Limit necessary due to:
- ☐ Discharge to lake, pond, or impoundment
- ☐ Discharge to stream

☒ Limit not necessary

Basis: Chapter 96.5 does not apply. However, monitoring for Total Phosphorus and Total Nitrogen will be retained with this renewal.

e. NO_2-NO_3, Fluoride, Phenolics, Sulfates, and Chlorides

Nearest Downstream potable water supply (PWS): Pennsylvania American Water Company - Ellwood City

Distance downstream from the point of discharge: 23.5 miles (approximate)

☒ No limits necessary
☐ Limits needed

Basis: Significant dilution available.

f. Ammonia-Nitrogen (NH_3-N)

Median discharge pH to be used: 7.2 Standard Units (S.U.)

Basis: Average pH value from DMR summary

Discharge temperature: 25°C (default value used for modeling purposes)

Median stream pH to be used: 7.0 Standard Units (S.U.)

Basis: Default value.

Stream Temperature: 20˚C (assumptive value used for CWF modeling purposes)

Background NH_3-N concentration: 0.1 mg/l

Basis: Default value.

Calculated summer NH_3-N limits: 25.0 mg/l (monthly average)
50.0 mg/l (instantaneous maximum)

Calculated winter NH_3-N limits: 25.0 mg/l (monthly average)
50.0 mg/l (instantaneous maximum)

Result: WQ modeling resulted in secondary limits (see Attachment 1) for the summer months, which are the same as the previous NPDES Permit. The more stringent limits set in the previous NPDES Permit of 17.5 mg/l monthly average and 35 mg/l instantaneous maximum in the summer months will be retained since the permittee is able to meet them. Per the SOP, the previous NH3-N winter limits of 52.5 mg/l monthly average and 105 mg/l instantaneous maximum will be set as three times the summer limits but were capped at the technology-based limits of 25 mg/l monthly average and 50 mg/l instantaneous maximum. Since the new limits are attainable, no compliance schedule will be necessary.

g. $CBOD_5$

Median discharge pH to be used: 7.2 Standard Units (S.U.)

Basis: Average pH value from DMR summary

Discharge temperature: 25°C (default value used for modeling purposes)

Median stream pH to be used: 7.0 Standard Units (S.U.)

Basis: Default value.

Stream Temperature: 20˚C (assumptive value used for CWF modeling

Background $CBOD_5$ concentration: 2.0 mg/l

Basis: Default value

Calculated summer $CBOD_5$ limits: 25.0 mg/l (monthly average)
50.0 mg/l (instantaneous maximum)

Calculated winter $CBOD_5$ limits: 25.0 mg/l (monthly average)
50.0 mg/l (instantaneous maximum)

Result: WQ modeling resulted in secondary limits (see Attachment 1) for the summer months, which are the same as the previous NPDES Permit. Per the SOP, the winter limits were set as three times the summer limits but were capped at the technology-based limits of 25 mg/l monthly average and 50 mg/l instantaneous maximum.

h. Dissolved Oxygen (DO)

- ☐ 3.0 mg/l - minimum required due to discharge going to a drainage swale or ditch.
- ☒ 4.0 mg/l - minimum desired in effluent to protect all aquatic life.
- ☐ 5.0 mg/l - desired in effluent for Warm Water / Trout-Stocked Fisheries.
- ☐ 6.0 mg/l - desired in effluent for Cold Water Fisheries.
- ☐ 7.0 mg/l - required due to discharge going to a High Quality / Exceptional Value stream

Discussion: Monitoring and reporting for Dissolved Oxygen was required in the previous permit, with the understanding that the next renewal NPDES Permit will contain a minimum requirement of 4.0 mg/l as recommended by the SOP based on Chapter 93.7, under the authority of Chapter 92a.61. The measurement frequency was increased from 5/week to 1/day as recommended in the SOP, based on Table 6-3 in the "Technical Guidance for the Development and Specification of Effluent Limitations" (362-0400-001).

i. Total Residual Chlorine (TRC)

- ☐ No limit necessary
- ☒ TRC limits: 0.5 mg/l (monthly average)
  1.6 mg/l (instantaneous maximum)

Basis: The technology-based TRC limits above were calculated using the TRC_Calc spreadsheet (see Attachment 3) at the first point of use. The new limits are more stringent than the previous limits of 1.0 mg/l monthly average and 2.3 mg/l instantaneous maximum. Based on eDMR data, the new limits are attainable, so a compliance schedule will not be necessary. The measurement frequency was increased from 5/week to 1/day as recommended in the SOP, based on Table 6-3 in the "Technical Guidance for the Development and Specification of Effluent Limitations" (362-0400-001).

Attachment Details:

Attachment 1 - WQ Modeling Printouts - Dry Stream

Attachment 2 - WQ Modeling Printouts - Perennial Stream

Attachment 3 - TRC_Calc Spreadsheet

Attachment 4 - Efacts open violations by client

If viewing this electronically, please refer to the following PDF to view the above Attachments:

Adobe Acrobat Document

Compliance History

DMR Data for Outfall 001 (from December 1, 2019 to November 30, 2020)

Parameter	NOV-20	OCT-20	SEP-20	AUG-20	JUL-20	JUN-20	MAY-20	APR-20	MAR-20	FEB-20	JAN-20	DEC-19
Flow (MGD) Average Monthly	0.0011	0.0010	0.0013	0.0012	0.0013	0.0013	0.0010	0.0004	0.0008	0.0026	0.0025	0.0029
Flow (MGD) Daily Maximum	0.0014	0.0012	0.0014	0.0013	0.0014	0.0014	0.0011	0.0006	0.0013	0.0028	0.0026	0.0031
pH (S.U.) Minimum	7.1	7.1	7.1	7.1	6.9	7.0	7.1	7.0	7.1	7.1	7.0	7.1
pH (S.U.) Maximum	7.4	7.5	7.4	7.6	7.5	7.4	7.5	7.5	7.5	7.4	7.4	7.5
DO (mg/L) Minimum	7.0	6.8	7.0	7.0	7.1	7.1	7.1	7.1	6.7	7.1	7.1	7.0
TRC (mg/L) Average Monthly	0.3	0.2	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2
CBOD5 (mg/L) Average Monthly	4	4	4	4	4	4	4	5	4	4	4	3
TSS (mg/L) Average Monthly	10	9	11	8	12	9	10	12	8	10	9	11
Fecal Coliform (CFU/100 ml) Geometric Mean	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Total Nitrogen (mg/L) Average Monthly	25.1	25.5	25.1	23.8	27.2	26.5	26.1	25.9	25.1	27.4	26.8	26.7
Ammonia (mg/L) Average Monthly	14.0	15.5	14.2	14.5	15.1	14.7	15.3	15.2	14.3	15.5	15.5	14.6
Total Phosphorus (mg/L) Average Monthly	2.740	2.740	2.760	2.660	2.680	3.750	2.67	2.82	2.87	2.75	2.90	2.71

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	Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	1/week	Measured
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	4.0 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	Grab
TSS	XXX	XXX	XXX	30.0	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
Total Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	2/month	Grab
Ammonia-Nitrogen Nov 1 - Apr 30	XXX	XXX	XXX	25.0	XXX	50	2/month	Grab
Ammonia-Nitrogen May 1 - Oct 31	XXX	XXX	XXX	17.5	XXX	35	2/month	Grab
Total Phosphorus	XXX	XXX	XXX	Report	XXX	XXX	2/month	Grab

Compliance Sampling Location: at Outfall 001, after disinfection.

Flow is monitor only based on Chapter 92a.61. The limits for Dissolved Oxygen and pH are technology-based on Chapter 93.7. The Total Residual Chlorine (TRC) limits are technology-based on Chapter 92a.48. The limits for $CBOD_5$, Total Suspended Solids, and Fecal Coliforms are technology-based on Chapter 92a.47. The limits for Ammonia-Nitrogen are water quality-based on Chapter 93.7. Monitoring for Total Nitrogen and Total Phosphorus is based on Chapter 92a.61.

Attachment 1

WQM 7.0 Effluent Limits (Perennial Model)

SWP Basin	Stream Code	Stream Name
20C	34197	JAMISON 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)
6.680	perennial	PA0035556p	0.012	CBOD5	7.42		
				NH3-N	10.5	21	
				Dissolved Oxygen			2

Outputs equal inputs from dry stream model so technology-based limits are protective.

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
20C	34197	JAMISON RUN

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
6.680	0.012	20.369	7.012
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
7.648	0.420	18.211	0.078
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.40	0.143	0.78	0.720
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.782	19.760	Owens	6
Reach Travel Time (days)			
1.258			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.126	2.36	0.71	8.19
0.252	2.31	0.65	8.19
0.377	2.27	0.59	8.19
0.503	2.23	0.54	8.19
0.629	2.19	0.49	8.19
0.755	2.15	0.45	8.19
0.880	2.11	0.41	8.19
1.006	2.07	0.38	8.19
1.132	2.04	0.34	8.19
1.258	2.00	0.31	8.19

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	6		

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
20C	34197	JAMISON RUN	**6.680**	1212.00	1.79	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	0.130	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.00	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
perennial	PA0035556p	0.0120	0.0000	0.0000	0.000	25.00	7.20

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	7.42	2.00	0.00	1.50
Dissolved Oxygen	2.00	8.24	0.00	0.00
NH3-N	10.50	0.00	0.00	0.70

From Dry Model

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
20C	34197	JAMISON RUN	**5.070**	1197.00	3.07	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	0.130	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.00	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
		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

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
20C	34197	JAMISON 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
6.680	perennial	9.18	21	9.18	21	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
6.680	perennial	1.87	10.5	1.87	10.5	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)		
6.68	perennial	7.42	7.42	10.5	10.5	2	2	0	0

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
20C	34197	JAMISON 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												
6.680	0.23	0.00	0.23	.0186	0.00176	.42	7.65	18.21	0.08	1.258	20.37	7.01
Q1-10 Flow												
6.680	0.15	0.00	0.15	.0186	0.00176	NA	NA	NA	0.06	1.579	20.55	7.02
Q30-10 Flow												
6.680	0.32	0.00	0.32	.0186	0.00176	NA	NA	NA	0.09	1.071	20.28	7.01

Attachment 2

WQM 7.0 D.O.Simulation (Dry Model)

SWP Basin	Stream Code	Stream Name
20C	34197	JAMISON RUN

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
7.160	0.012	23.365	7.124
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
1.567	0.312	5.019	0.056
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
17.48	1.411	16.82	0.907
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
3.346	29.508	Owens	NA
Reach Travel Time (days)			
0.520			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.052	16.04	16.05	2.00
0.104	14.73	15.31	2.00
0.156	13.52	14.60	2.00
0.208	12.41	13.93	2.00
0.260	11.39	13.29	2.00
0.312	10.46	12.68	2.00
0.364	9.60	12.09	2.00
0.416	8.81	11.54	2.00
0.468	8.09	11.01	2.00
0.520	7.42	10.50	2.00

Input into perennial model

WQM 7.0 Modeling Specifications

Parameters	D.O.	Use Inputted Q1-10 and Q30-10 Flows	☑
WLA Method	Simulation	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	2		

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
20C	34197	JAMISON RUN	**7.160**	1259.00	0.07	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	0.130	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.00	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
Dry Stream	PA0035556d	0.0120	0.0000	0.0000	0.000	25.00	7.20

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	2.00	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
20C	34197	JAMISON RUN	**6.680**	1212.00	1.79	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	0.130	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.00	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
		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

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
20C	34197	JAMISON 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												
7.160	0.01	0.00	0.01	NA	0.01854	.312	1.57	5.02	0.06	0.520	23.36	7.12
Q1-10 Flow												
7.160	0.01	0.00	0.00	NA	0.01854	NA	NA	NA	0.00	0.000	0.00	0.00
Q30-10 Flow												
7.160	0.01	0.00	0.00	NA	0.01854	NA	NA	NA	0.00	0.000	0.00	0.00

Attachment 3

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

0.2327	= Q stream (cfs)	0.5	= CV Daily
0.012	= 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)	0	=Decay Coefficient (K)

Source	Reference	AFC Calculations	Reference	CFC Calculations
TRC	1.3.2.iii	WLA afc = 4.018	1.3.2.iii	WLA cfc = 3.909
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 1.497	5.1d	LTA_cfc = 2.273

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)**

Attachment 4

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

WATER MANAGEMENT SYSTEM
OPEN VIOLATIONS BY CLIENT

Client ID: 189304
Client: All

Open Violations: 19

	CLIENT ID	CLIENT	PF ID	FACILITY	PF KIND	PF STATUS	INSP PROGRAM
1	189304	PA DOT MAINT & OPR BUR	575165	ADAMS CNTY MAINT FAC	Public Administration	Active	Storage Tanks
2	189304	PA DOT MAINT & OPR BUR	575165	ADAMS CNTY MAINT FAC	Public Administration	Active	Storage Tanks
3	189304	PA DOT MAINT & OPR BUR	575165	ADAMS CNTY MAINT FAC	Public Administration	Active	Storage Tanks
4	189304	PA DOT MAINT & OPR BUR	587352	CNTY MAINT BLDG 1	Public Administration	Active	Storage Tanks
5	189304	PA DOT MAINT & OPR BUR	590055	CTL GARAGE	Public Administration	Active	Storage Tanks
6	189304	PA DOT MAINT & OPR BUR	590055	CTL GARAGE	Public Administration	Active	Storage Tanks
7	189304	PA DOT MAINT & OPR BUR	590055	CTL GARAGE	Public Administration	Active	Storage Tanks
8	189304	PA DOT MAINT & OPR BUR	590055	CTL GARAGE	Public Administration	Active	Storage Tanks
9	189304	PA DOT MAINT & OPR BUR	590055	CTL GARAGE	Public Administration	Active	Storage Tanks
10	189304	PA DOT MAINT & OPR BUR	593999	FULTON CNTY MAINT BLDG	Public Administration	Active	Storage Tanks
11	189304	PA DOT MAINT & OPR BUR	594307	PENNDOT HUNTINGDON CNTY MAINT BLDG 9 5	Public Administration	Active	Storage Tanks
12	189304	PA DOT MAINT & OPR BUR	616077	ENG DIST 8 0 MAINT BLDG	Public Administration	Active	Storage Tanks
13	189304	PA DOT MAINT & OPR BUR	616077	ENG DIST 8 0 MAINT BLDG	Public Administration	Active	Storage Tanks
14	189304	PA DOT MAINT & OPR BUR	616077	ENG DIST 8 0 MAINT BLDG	Public Administration	Active	Storage Tanks
15	189304	PA DOT MAINT & OPR BUR	616077	ENG DIST 8 0 MAINT BLDG	Public Administration	Active	Storage Tanks
16	189304	PA DOT MAINT & OPR BUR	616077	ENG DIST 8 0 MAINT BLDG	Public Administration	Active	Storage Tanks
17	189304	PA DOT MAINT & OPR BUR	616077	ENG DIST 8 0 MAINT BLDG	Public Administration	Active	Storage Tanks
18	189304	PA DOT MAINT & OPR BUR	616077	ENG DIST 8 0 MAINT BLDG	Public Administration	Active	Storage Tanks
19	189304	PA DOT MAINT & OPR BUR	616077	ENG DIST 8 0 MAINT BLDG	Public Administration	Active	Storage Tanks

	PROGRAM SPECIFIC ID	INSP ID	VIOLATION ID	INSPECTION CATEGORY	VIOLATION DATE	VIOLATION CODE	VIOLATION
1	01-26853	3117796	901445	PF	11/30/2020	245.441	Failure to comply with underground storage tank system release detection requirements
2	01-26853	3117796	901446	PF	11/30/2020	245.441	Failure to comply with underground storage tank system release detection requirements
3	01-26853	3117796	901447	PF	11/30/2020	245.438(A)	Failure to comply with UST system monthly operation and maintenance walkthrough inspections
4	16-26876	3120343	901813	PF	11/16/2020	245.441	Failure to comply with underground storage tank system release detection requirements
5	22-26845	3059855	889690	PF	05/27/2020	245.441	Failure to comply with underground storage tank system release detection requirements
6	22-26845	3059855	889691	PF	05/27/2020	245.436	Emergency Procedures
7	22-26845	3059855	889692	PF	05/27/2020	245.436(E)	Failure to maintain documentation of designated operators
8	22-26845	3059855	889693	PF	05/27/2020	245.438(A)	Failure to comply with UST system monthly operation and maintenance walkthrough inspections
9	22-26845	3059855	889694	PF	05/27/2020	245.421	Failure to meet performance standards for new/upgraded tanks
10	29-26887	3127393	903425	PF	12/23/2020	245.432	Failure to comply with underground storage tank system release detection requirements
11	31-26886	3125143	902956	PF	12/22/2020	245.431	Spill and overfill control
12	67-26848	3088315	895876	PF	10/01/2020	245.432	Failure to comply with underground storage tank system release detection requirements
13	67-26848	3096087	897555	PF	09/25/2020	245.432	Failure to comply with underground storage tank system release detection requirements
14	67-26848	3096087	897556	PF	09/25/2020	245.432	Failure to comply with underground storage tank system release detection requirements
15	67-26848	3096087	897557	PF	09/25/2020	245.432	Failure to comply with underground storage tank system release detection requirements
16	67-26848	3096087	897558	PF	09/25/2020	245.432	Failure to comply with underground storage tank system release detection requirements
17	67-26848	3096087	897559	PF	09/25/2020	245.437	Failure to comply with UST system periodic equipment testing requirements
18	67-26848	3096087	897560	PF	09/25/2020	245.437	Failure to comply with UST system periodic equipment testing requirements
19	67-26848	3096087	897561	PF	09/25/2020	245.441	Failure to comply with underground storage tank system release detection requirements