pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0219045**
Facility Type	**Non-Municipal**	APS ID	**1063118**
Major / Minor	**Minor**	Authorization ID	**1395835**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Apollo Ridge School District**	Facility Name	**Apollo Ridge School District STP**
Applicant Address	1825 State Route 56	Facility Address	State Route 56
	Spring Church, PA 15686-9735		Spring Church, PA 15686
Applicant Contact	Greg Barsoum (Barsoumg@apolloridge.com)	Facility Contact	Greg Barsoum (Barsoumg@apolloridge.com)
Applicant Phone	(724) 478-6050	Facility Phone	(724) 478-6050
Client ID	51860	Site ID	550928
Ch 94 Load Status	Not Overloaded	Municipality	Kiskiminetas Township
Connection Status	No Limitations	County	Armstrong
Date Application Received	May 10, 2022	EPA Waived?	Yes
Date Application Accepted	May 11, 2022	If No, Reason	-
Purpose of Application	Renewal of an existing NPDES Permit for an existing discharge of treated sanitary wastewater from a non-municipal sewer system.		

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 meet the limits of this permit, which will 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
- F. Little Assimilative Capacity

SPECIAL CONDITIONS:

II. Solids Management

There are no open violations in efacts associated with the subject Client ID (51860) as of 3/29/2023. *4/18/2023 CWY*

Approve	Deny	Signatures	Date
X		Stephen A. McCauley Stephen A. McCauley, E.I.T. / Environmental Engineering Specialist	3/29/2023
X		Chad W. Yurisic Chad W. Yurisic, P.E. / Environmental Engineer Manager	4/18/2023

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.0267
Latitude	40º 36' 7.00"	Longitude	-79º 28' 37.00"
Quad Name	-	Quad Code	-
Wastewater Description:	Sewage Effluent		
Receiving Waters	Unnamed Tributary to the Roaring Run (CWF)	Stream Code	N/A
NHD Com ID	125291151	RMI	N/A
Drainage Area	0.62	Yield (cfs/mi^2)	0.1
Q_{7-10} Flow (cfs)	0.062	Q_{7-10} Basis	calculated
Elevation (ft)	1385	Slope (ft/ft)	0.04753
Watershed No.	18-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	Final*	Name	Kiskiminetas-Conemaugh River Watersheds TMDL

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

Nearest Downstream Public Water Supply Intake	Buffalo Township Municipal Water Authority - Freeport		
PWS Waters	Allegheny River	Flow at Intake (cfs)	2,576
PWS RMI	30.0	Distance from Outfall (mi)	23.0

* - This discharge consists of treated non-municipal sewage only and does not contribute to the impairment of the receiving stream. However, since the stream is impaired for AMD metals, per the SOP, monitoring for Total Aluminum, Total Iron, and Total Manganese will be retained with this renewal.

Sludge use and disposal description and location(s): All sludge is hauled by CWM Environmental to the AVJSA WWTP, where it is disposed of at an approved landfill.

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 0.0267 MGD of treated sewage from two existing schools in Kiskiminetas Township, Armstrong County.

Treatment permitted under WQM Permit No. 0301404 consists of the following: A muffin monster with bypass bar screen, a two-chamber flow equalization tank, six aeration tanks in series, one clarifier, a two-chamber aerobic digester, tablet chlorine disinfection with a contact tank, sodium bisulfite dechlorination, a polishing tank, and a post-aeration chamber. The treated effluent flows into a storm sewer pipe and then into an unnamed tributary to the Roaring Run.

1. Streamflow:

Crooked Creek at Idaho, Pa. 03038000 (1970-2008)

Drainage Area:	191	sq. mi.	(USGS StreamStats)
Q_{7-10}:	19.9	cfs	(USGS StreamStats)
Yieldrate:	0.1	cfsm	calculated

Unnamed Tributary to the Roaring Run at Outfall 001:

Yieldrate:	0.1	cfsm	calculated above
Drainage Area:	0.62	sq. mi.	(USGS StreamStats)
% of stream allocated:	100%	Basis:	No nearby discharges
Q_{7-10}:	0.062	cfs	calculated

2. Wasteflow:

Maximum discharge: 0.0267 MGD = 0.04 cfs

Runoff flow period: 24 hours Basis: Runoff with flow equalization

The calculated stream flow (Q7-10) is less than 3 times the permitted discharge flow. However, since this is an existing discharge, the more stringent treatment requirements cannot be achieved, and the receiving stream is not impaired by the discharge, the standards in DEP guidance (391-2000-014) will not be applied.

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, E. Coli, Total Phosphorus, Total Nitrogen, NH_3-N, $CBOD_5$, Dissolved Oxygen, and Total Residual Chlorine.

a. pH

Between 6.0 and 9.0 at all times

Basis: Application of Chapter 93.7 technology-based limits.

The measurement frequency will remain as 5/week per the SOP.

b. Total Suspended Solids

Limits are 30.0 mg/l as a monthly average and 60.0 as an instantaneous maximum based on Chapter 92a47.

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 92a47 technology-based limits

d. E. Coli

Monitoring was added for E. Coli at a frequency of 1/year.

Basis: Application of Chapter 92a.61 as recommended by the SOP for flows between 0.002 MGD and 0.05 MGD.

e. Total Phosphorus

Chapter 96.5 does not apply. The previous monitoring for Total Phosphorus will be retained in accordance with the SOP, based on Chapter 92a.61. However, the monitoring frequency will be reduced from 1/quarter to 1/year since the receiving stream is not impaired, per the SOP.

f. Total Nitrogen

The previous monitoring for Total Nitrogen will be retained in accordance with the SOP, based on Chapter 92a.61. However, the monitoring frequency will be reduced from 1/quarter to 1/year since the receiving stream is not impaired, per the SOP.

g. Ammonia-Nitrogen (NH_3-N)

Median discharge pH to be used:	7.5	Standard Units (S.U.)
	Basis:	eDMR data from previous 12 months
Discharge temperature:	25°C	(default value used in the absence of data)
Median stream pH to be used:	7.0	Standard Units (S.U.)
	Basis:	default value used in the absence of data
Stream Temperature:	20˚C	(default value used for CWF modeling)
Background NH_3-N concentration:	0.1	mg/l
	Basis:	Default value
Calculated NH_3-N Summer limits:	5.3	mg/l (monthly average)
	10.6	mg/l (instantaneous maximum)
Calculated NH_3-N Winter limits:	15.9	mg/l (monthly average)
	31.8	mg/l (instantaneous maximum)

Result: WQ modeling resulted in the summer limits above (see Attachment 1). The winter limits are calculated as three times the summer limits. The calculated limits are less restrictive than in the previous permit. Since the previous limits are attainable, they will be retained.

h. $CBOD_5$

Median discharge pH to be used:	7.5	Standard Units (S.U.)
	Basis:	eDMR data from previous 12 months
Discharge temperature:	25°C	(default value used in the absence of data)
Median stream pH to be used:	7.0	Standard Units (S.U.)

Basis: default value used in the absence of data

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

Background $CBOD_5$ concentration: 2.0 mg/l

Basis: Default value

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

Result: WQ modeling resulted in the calculated limits above (see Attachment 1). The limits are the same as in the previous permit and will be retained.

i. Dissolved Oxygen (DO)

The technology-based minimum of 3.0 mg/l is recommended by the WQ Model (see Attachment 1) and the SOP based on Chapter 93.7, under the authority of Chapter 92a.61. However, the previous technology-based limit of 6.0 mg/l from DEP guidance number 391-2000-014 will be retained.

The measurement frequency will remain as 5/week per the SOP.

j. Disinfection

☐ Ultraviolet (UV) light

☒ TRC limits: 0.22 mg/l (monthly average)

0.74 mg/l (instantaneous maximum)

Basis: The TRC limits above were calculated using the Department's TRC Calculation Spreadsheet (see Attachment 2). The calculated limits are less restrictive than in the previous permit. Since the previous limits are attainable, they will be retained.

The measurement frequency will remain as 5/week per the SOP.

4. Reasonable Potential Analysis for Receiving Stream:

A Reasonable Potential Analysis was not performed in accordance with State practices using the Department's Toxics Management Spreadsheet since no sampling other than sewage-related parameters was performed for this facility with the renewal application.

5. Reasonable Potential for Downstream Public Water Supply (PWS):

The Department's Toxics Management Spreadsheet does not calculate limits for parameters that are based on PWS criteria (TDS, Chloride, Bromide, and Sulfate). However, since no sample data was provided, mass-balance calculations were not performed.

Nearest Downstream potable water supply (PWS): Buffalo Township Municipal Water Authority - Freeport
Distance downstream from the point of discharge: 23.0 miles

Result: No limits or monitoring is necessary as there is significant dilution available.

6. Anti-Backsliding:

Since all the permit limits in this renewal are the same or more restrictive than the previous NPDES Permit, anti-backsliding is not applicable.

7. Attachment List:

Attachment 1 - WQ Modeling Printouts
Attachment 2 - TRC_Calc Spreadsheet

(The Attachments above can be found at the end of this document)

Compliance History

DMR Data for Outfall 001 (from February 1, 2022 to January 31, 2023)

Parameter	JAN-23	DEC-22	NOV-22	OCT-22	SEP-22	AUG-22	JUL-22	JUN-22	MAY-22	APR-22	MAR-22	FEB-22
Flow (MGD) Average Monthly	0.00327	0.00319	0.00257	0.00504	0.00614	0.00136	0.00029	0.00444	0.00548	0.00398	0.00454	0.00934
pH (S.U.) Minimum	7.41	7.55	7.51	7.17	7.34	7.48	7.5	7.12	7.01	6.94	6.86	6.72
pH (S.U.) Maximum	8.62	8.28	8.78	8.16	8.38	8.26	8.65	8.72	7.97	7.87	8.26	8.52
DO (mg/L) Minimum	9.59	11.24	9.72	8.98	7.14	6.58	7.21	6.41	7.59	9.31	10.42	11.4
TRC (mg/L) Average Monthly	< 0.10	< 0.04	< 0.10	0.05	0.1	0.1	0.04	< 0.10	0.05	0.04	< 0.1	< 0.1
TRC (mg/L) Instantaneous Maximum	0.21	0.13	0.22	0.1	0.21	0.19	0.10	0.21	0.13	0.15	0.28	0.21
CBOD5 (mg/L) Average Monthly	< 9.0	< 3.0	< 3.0	< 3.0	3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
CBOD5 (mg/L) Instantaneous Maximum	14.3	< 3.0	< 3.0	3.3	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
TSS (mg/L) Average Monthly	5.0	6.0	< 3.0	6.0	9.0	< 4.0	< 4.0	< 3.0	8.0	< 3.0	< 4.0	< 3.0
TSS (mg/L) Instantaneous Maximum	5.0	8.0	< 3.0	7	10.0	4.0	4.0	3.0	8.0	3.0	4.0	< 3.0
Fecal Coliform (No./100 ml) Geometric Mean	< 1.0	< 1.0	< 16.0	135.0	118	19.0	18.0	30.0	95	17	< 14.0	74
Fecal Coliform (No./100 ml) Instantaneous Maximum	< 1.0	< 1.0	31	436	1554	33.0	18.0	58.0	167	29.0	26.0	143
Total Nitrogen (mg/L) Daily Maximum		< 1.0										
Ammonia (mg/L) Average Monthly	< 0.20	0.10	< 0.10	0.1	< 0.20	< 0.10	0.1	0.20	0.10	< 0.101	0.10	0.20
Ammonia (mg/L) Instantaneous Maximum	0.22	0.13	< 0.10	0.14	0.39	< 0.10	0.16	0.24	0.13	0.14	0.15	0.34
Total Phosphorus (mg/L) Daily Maximum		9.19										
Total Aluminum (mg/L) Daily Maximum		< 0.10										
Total Iron (mg/L) Daily Maximum		0.07										
Total Manganese (mg/L) Daily Maximum		< 0.02										

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	XXX	XXX	XXX	XXX	XXX	2/month	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	9.0	XXX	5/week	Grab
DO	XXX	XXX	6.0	XXX	XXX	XXX	5/week	Grab
TRC	XXX	XXX	XXX	0.1	XXX	0.3	5/week	Grab
CBOD5	XXX	XXX	XXX	25.0	XXX	50.0	2/month	Grab
TSS	XXX	XXX	XXX	30.0	XXX	60.0	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	XXX	Report	1/year	Grab
Total Nitrogen	XXX	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	Grab
Ammonia Nov 1 - Apr 30	XXX	XXX	XXX	5.5	XXX	11.0	2/month	Grab
Ammonia May 1 - Oct 31	XXX	XXX	XXX	2.0	XXX	4.0	2/month	Grab
Total Phosphorus	XXX	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	Grab
Total Aluminum	XXX	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	Grab

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		
Total Iron	XXX	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	Grab
Total Manganese	XXX	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	Grab

Compliance Sampling Location: at Outfall 001, after disinfection.

Flow is monitor only based on Chapter 92a.61. The limits for pH and Dissolved Oxygen are technology-based on Chapter 93.7. The Total Residual Chlorine (TRC) limits are water quality-based on Chapter 93.7. The limits for $CBOD_5$, Total Suspended Solids (TSS), 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 E. Coli, Total Nitrogen, Total Phosphorus, Total Aluminum, Total Iron, and Total Manganese is based on Chapter 92a.61.

Attachment 1

WQM 7.0 Effluent Limits (Perennial Reach)

SWP Basin	Stream Code	Stream Name
18B	43050	ROARING 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)
1.430	Apollo Ridge	PA0219045a	0.027	CBOD5	19.23		
				NH3-N	4.93	9.86	
				Dissolved Oxygen			3

CBOD5 is the same as the Dry Reach input, so the Dry Reach limit is protective.

The DO limit is more restrictive than the Dry Reach inputs, so it governs.

For NH3-N, the limit can be back-calculated using the equation: Ct = (Co)e-(kt), where

Ct = 4.93 mg/l
k = 0.7 days-1 = constant for NH3-N
t = 0.127 days = Dry Reach Model travel time

Therefore, 4.93 mg/l = (Ct)e-(0.7 days-1)(0.127 days)

Ct = 5.38

NH3-N = 5.3 mg/l

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
18B	43050	ROARING RUN

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
1.430	0.027	21.999	7.139
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
3.524	0.371	9.485	0.079
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
8.89	1.149	1.97	0.816
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.147	25.927	Owens	6
Reach Travel Time (days)			
0.774			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.077	8.06	1.85	7.71
0.155	7.31	1.74	7.95
0.232	6.63	1.63	7.95
0.310	6.02	1.53	7.95
0.387	5.46	1.44	7.95
0.465	4.95	1.35	7.95
0.542	4.49	1.27	7.95
0.619	4.07	1.19	7.95
0.697	3.70	1.11	7.95
0.774	3.35	1.05	7.95

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
18B	43050	ROARING RUN	**1.430**	1385.00	0.62	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	0.100	0.00	0.00	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
Apollo Ridge	PA0219045a	0.0267	0.0000	0.0000	0.000	25.00	7.50

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	19.23	2.00	0.00	1.50
Dissolved Oxygen	2.00	8.24	0.00	0.00
NH3-N	21.45	0.00	0.00	0.70

(input from Dry Reach)

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
18B	43050	ROARING RUN	**0.430**	1134.00	1.37	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	0.100	0.00	0.00	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

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
18B	43050	ROARING 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
1.430	Apollo Ridge	11.28	22.11	11.28	22.11	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
1.430	Apollo Ridge	1.62	4.93	1.62	4.93	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)		
1.43	Apollo Ridge	19.23	19.23	4.93	4.93	3	3	0	0

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
18B	43050	ROARING 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												
1.430	0.06	0.00	0.06	.0413	0.04754	.371	3.52	9.49	0.08	0.774	22.00	7.14
Q1-10 Flow												
1.430	0.04	0.00	0.04	.0413	0.04754	NA	NA	NA	0.07	0.887	22.55	7.19
Q30-10 Flow												
1.430	0.08	0.00	0.08	.0413	0.04754	NA	NA	NA	0.09	0.694	21.64	7.11

WQM 7.0 D.O.Simulation (Dry Reach)

SWP Basin	Stream Code	Stream Name
18B	43050	ROARING RUN

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
0.220	0.027	24.882	7.478
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
0.931	0.429	2.171	0.106
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
24.41	1.500	24.41	1.019
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
3.953	25.910	Owens	NA
Reach Travel Time (days)			
0.127			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.013	23.83	24.10	2.00
0.025	23.27	23.79	2.00
0.038	22.73	23.48	2.00
0.051	22.19	23.18	2.00
0.063	21.67	22.88	2.00
0.076	21.16	22.59	2.00
0.089	20.66	22.30	2.00
0.102	20.17	22.01	2.00
0.114	19.70	21.73	2.00
0.127	19.23	21.45	2.00

(input into Perennial Reach)

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
18B	43050	ROARING RUN	**0.220**	1399.00	0.01	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	0.100	0.00	0.00	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
Dry Reach	PA0219045	0.0267	0.0000	0.0000	0.000	25.00	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	0.00	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
18B	43050	ROARING RUN	**0.000**	1385.00	0.02	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	0.100	0.00	0.00	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

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
18B	43050	ROARING 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												
0.220	0.00	0.00	0.00	NA	0.01205	.429	.93	2.17	0.11	0.127	24.88	7.48
Q1-10 Flow												
0.220	0.00	0.00	0.00	NA	0.01205	NA	NA	NA	0.00	0.000	0.00	0.00
Q30-10 Flow												
0.220	0.00	0.00	0.00	NA	0.01205	NA	NA	NA	0.00	0.000	0.00	0.00

Attachment 2

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

0.062	= Q stream (cfs)	0.5	= CV Daily
0.0267	= 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 = 0.498	1.3.2.iii	WLA cfc = 0.478
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 0.186	5.1d	LTA_cfc = 0.278

Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AML MULT = 1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.228	AFC
		INST MAX LIMIT (mg/l) = 0.747	

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)**