pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0090182**
Facility Type	**Non-Municipal**	APS ID	**1038043**
Major / Minor	**Minor**	Authorization ID	**1353365**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Concordia Lutheran Health & Human Care**	Facility Name	**Concordia Lutheran Home**
Applicant Address	134 Marwood Road	Facility Address	134 Marwood Road
	Cabot, PA 16023		Cabot, PA 16023
Applicant Contact	Brian Hortert (bhortert@concordialm.org)	Facility Contact	Dave Drane, (ddrane@concordialm.org)
Applicant Phone	(724) 352-1571	Facility Phone	(724) 352-1571
Client ID	32900	Site ID	244079
Ch 94 Load Status	Not Overloaded	Municipality	Jefferson Township
Connection Status	No Limitations	County	Butler
Date Application Received	April 16, 2021	EPA Waived?	Yes
Date Application Accepted	May 7, 2021	If No, Reason	-

Purpose of Application: Renewal of an NPDES Permit for an existing discharge of treated sanitary wastewater.

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 Permittee 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. Little or no Assimilative Capacity

SPECIAL CONDITIONS:

II. Solids Management

There are 6 open violations in efacts for Client ID (32900) as of 7/27/2023 (see Attachment 1). *8/15/2023 CWY*

Approve	Return	Deny	Signatures	Date
X			Stephen A. McCauley Stephen A. McCauley, E.I.T. / Environmental Engineering Specialist	7/27/2023
X			Chad W. Yurisic Chad W. Yurisic, P.E. / Environmental Engineer Manager	8/15/2023

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	001	Design Flow (MGD)	0.09
Latitude	40º 46' 12.90"	Longitude	-79º 47' 11.30"
Quad Name	-	Quad Code	-
Wastewater Description:	Effluent		
Receiving Waters	Unnamed Tributary to the Little Buffalo Creek (HQ-TSF)	Stream Code	N/A
NHD Com ID	123973207	RMI	N/A
Drainage Area	0.0497	Yield (cfs/mi^2)	0.07
Q_{7-10} Flow (cfs)	0.0034	Q_{7-10} Basis	calculated
Elevation (ft)	1300	Slope (ft/ft)	0.021
Watershed No.	18-F	Chapter 93 Class.	HQ-TSF
Existing Use	-	Existing Use Qualifier	-
Exceptions to Use	-	Exceptions to Criteria	-
Assessment Status	Impaired*		
Cause(s) of Impairment	Habitat Alterations, Nutrients		
Source(s) of Impairment	Agriculture, On-Site Treatment Systems (Septic Systems and Similar Decentralized Systems), Removal of Riparian Vegetation		
TMDL Status	-	Name	-
Background/Ambient Data		Data Source	
pH (SU)	-	-	
Temperature (°F)	-	-	
Hardness (mg/L)	-	-	
Other:	-	-	
Nearest Downstream Public Water Supply Intake		Allegheny County Sanitary Authority (ALCOSAN)	
PWS Waters	Allegheny River	Flow at Intake (cfs)	1,407
PWS RMI	1.0	Distance from Outfall (mi)	40.0

* - This facility is not expected to contribute to the nutrient impairments of the receiving stream due to the restrictive limits set for Total Phosphorus and Total Nitrogen based on the receiving stream being effluent-dominated.

Sludge use and disposal description and location(s): Sludge is not used, it is hauled by McCutchen Enterprises to the Kiski Valley Water Pollution Control Authority STP, 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 0.09 MGD of treated sewage from a non-municipal STP in Jefferson Township, Butler County.

Existing treatment consists of: (WQM Permit no. 1090402 A-5) Equalization, aeration, alum and soda ash chemical addition, settling, a UVIREX 230 ultraviolet (UV) light disinfection unit, three fixed media filters, and aerated sludge holding.

1. Streamflow:

Unnamed Tributary to the Little Buffalo Creek:

Drainage Area:	0.0497	sq. mi.		(from StreamStats)
Yieldrate:	0.07	cfsm		(Assumed for small streams)
% of stream allocated:	100%		Basis:	no nearby discharges
Q_{7-10}:	0.0034	cfs		(Calculated)

2. Wasteflow:

Maximum discharge: 0.09 MGD = 0.139 cfs

Runoff flow period: 16 hours Basis: Runoff flow for an Assisted Living Facility

24 hour flow: 0.09 MGD x 24/16 = 0.135 MGD = 0.208 cfs

The calculated stream flow is less than the permitted discharge flow. In accordance with the SOP, since there is less than 3 parts stream flow (Q7-10) to 1 part effluent (design flow), the treatment requirements in document number 391-2000-014, titled, "Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers", dated April 12, 2008, will be implemented in this NPDES Permit.

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 Disinfection.

a. pH

Between 6.0 and 9.0 at all times

Basis: Application of Chapter 93.7 technology-based limits.

The measurement frequency was previously set 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), which will be retained.

b. Total Suspended Solids

Limits are 10.0 mg/l as a monthly average and 20.0 as an instantaneous maximum.

Basis: The previous limits will be retained per the SOP, based on document number 391-2000-014.

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/quarter.

Basis: Application of Chapter 92a.61 as recommended by the SOP for flows between 0.05 MGD and 1.0 MGD.

e. Total Phosphorus

The previous Total Phosphorus technology-based limits of 0.5 mg/l monthly average and 1.0 instantaneous maximum will be retained with this renewal per the SOP, based on document number 391-2000-014.

f. Total Nitrogen

The previous Total Nitrogen technology-based limits of 5.0 mg/l monthly average and 10.0 instantaneous maximum will be retained with this renewal per the SOP, based on document number 391-2000-014.

g. Ammonia-Nitrogen (NH_3-N)

Median discharge pH to be used:	7.4	Standard Units (S.U.)
		Basis: Average pH value from DMR summary
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:	25˚C	(default value used for HQ/TSF modeling)
Background NH_3-N concentration:	0.1	mg/l
		Basis: Default value used in the absence of data
calculated summer NH_3-N limits:	6.0	mg/l (monthly average)
	12.0	mg/l (instantaneous maximum)
calculated winter NH_3-N limits:	18.0	mg/l (monthly average)
	36.0	mg/l (instantaneous maximum)

Result: WQ modeling resulted in the calculated summer limits above (see Attachment 2), which are less restrictive than in the previous NPDES Permit. The winter limits are calculated as three times the summer limits. However, since the previous NH3-N limits of 2.0 mg/l monthly average (summer) and 6.0 mg/l monthly average (winter) are attainable, they will be retained with this renewal.

h. $CBOD_5$

Median discharge pH to be used:	7.4	Standard Units (S.U.)

Basis: Average pH value from DMR summary

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: 25˚C (default value used for HQ/TSF modeling)

Background $CBOD_5$ concentration: 2.0 mg/l

Basis: Default value used in the absence of data

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

Result: WQ modeling resulted in the calculated CBOD5 limits above (see Attachment 2), which are the same as the previous NPDES Permit. The winter limits are calculated as three times the summer limits, but since the technology-based limits are more protective, they will be used. However, since the discharge flows to an effluent-dominated stream, the technology-based limits of 10.0 mg/l average monthly and 20.0 mg/l instantaneous maximum from document number 391-2000-014 will be retained.

i. Dissolved Oxygen (DO)

The technology-based minimum of 4.0 mg/l is recommended by the WQ Model (see Attachment 2) and the SOP based on Chapter 93.7, under the authority of Chapter 92a.61. However, the previous Dissolved Oxygen minimum requirement was set as 6.0 mg/l to comply with the SOP and with document number 391-2000-014 and will be retained.

The measurement frequency was previously set 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), which will be retained.

j. Disinfection

☒ Ultraviolet (UV) light monitoring

☐ Total Residual Chlorine (TRC): mg/l (monthly average)
mg/l (instantaneous maximum)

Basis: UV Intensity (µw/cm²) reporting will be retained with this renewal.

The measurement frequency will be set 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).

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): Allegheny County Sanitary Authority (ALCOSAN)
Distance downstream from the point of discharge: 40.0 miles (approximate)

Result: No limits are necessary as significant dilution is 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 - WMS Open Violations by Client
Attachment 2 - WQM Printouts

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

Compliance History

DMR Data for Outfall 001 (from June 1, 2022 to May 31, 2023)

Parameter	MAY-23	APR-23	MAR-23	FEB-23	JAN-23	DEC-22	NOV-22	OCT-22	SEP-22	AUG-22	JUL-22	JUN-22
Flow (MGD) Average Monthly	0.063	0.62	0.057	0.066	0.061	0.058	0.071	0.060	0.062	0.056	0.056	0.058
Flow (MGD) Daily Maximum	0.073	0.69	0.066	0.070	0.064	0.075	0.080	0.069	0.075	0.071	0.065	0.066
pH (S.U.) Minimum	7.69	7.61	7.41	7.50	7.41	7.41	7.43	7.38	7.77	6.97	6.71	7.55
pH (S.U.) Maximum	8.08	7.96	7.94	7.72	7.93	7.91	7.65	7.68	7.22	7.83	8.02	7.71
DO (mg/L) Minimum	6.15	6.31	7.28	7.21	6.75	6.48	6.41	6.22	6.21	6.21	6.10	7.10
TRC (mg/L) Average Monthly	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.002	< 0.001	0.001	0.002
TRC (mg/L) Instantaneous Maximum	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
CBOD5 (mg/L) Average Monthly	< 2.69	< 2.00	< 2.46	< 3.56	3.67	< 2.0	< 2.10	< 4.76	5.48	< 2.5	< 2.59	3.99
TSS (mg/L) Average Monthly	< 5.0	< 5.0	< 5.0	6.0	7.0	< 5.5	< 5.0	6.50	< 6.0	< 5.0	< 5.0	< 5.0
Fecal Coliform (No./100 ml) Geometric Mean	39.12	< 5.0	< 5.0	< 5.0	< 7.07	34.18	131.30	< 12.5	111.43	< 5.04	< 5.0	< 137
Fecal Coliform (No./100 ml) Instantaneous Maximum	306	5	5.0	< 5.0	10	73	1724	20	2306	5.12	< 5.0	269
Total Nitrogen (mg/L) Average Monthly	1.06	1.68	1.61	4.17	3.25	4.65	4.39	4.702	4.39	4.59	5.12	5.0
Ammonia (mg/L) Average Monthly	< 0.407	< 0.43	< 0.800	2.10	< 2.28	< 1.63	1.25	< 1.59	< 1.02	2.19	2.39	< 2.36
Total Phosphorus (mg/L) Average Monthly	< 0.13	< 0.12	< 0.12	0.21	0.18	0.115	0.12	0.12	< 0.10	0.14	0.14	< 0.2

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	6.0 Inst Min	XXX	XXX	XXX	1/day	Grab
CBOD5	XXX	XXX	XXX	10.0	XXX	20	2/month	8-Hr Composite
TSS	XXX	XXX	XXX	10.0	XXX	20	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/quarter	Grab
UV Intensity (µw/cm²)	XXX	XXX	XXX	Report Daily Max	XXX	XXX	1/day	Metered
Total Nitrogen	XXX	XXX	XXX	5.0	XXX	10	2/month	8-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	XXX	XXX	XXX	6.0	XXX	12	2/month	8-Hr Composite
Ammonia-Nitrogen May 1 - Oct 31	XXX	XXX	XXX	2.0	XXX	4	2/month	8-Hr Composite
Total Phosphorus	XXX	XXX	XXX	0.5	XXX	1	2/month	8-Hr Composite

Compliance Sampling Location: at Outfall 001, after ultraviolet (UV) light disinfection.

Flow is monitor only based on Chapter 92a.61. The limits for pH are technology-based on Chapter 93.7. The limits for Dissolved Oxygen are technology-based on the Dry Streams Guidance. The limits for $CBOD_5$, Total Suspended Solids, and Fecal Coliforms are technology-based on Chapter 92a.47. E. Coli and UV Intensity are monitor only based on Chapter 92a.61. The limits for Total Nitrogen and Total Phosphorus are technology-based on the Dry Streams Guidance. The limits for Ammonia-Nitrogen are water quality-based on Chapter 93.7.

Attachment 1

pennsylvania DEPARTMENT OF ENVIRONMENTAL PROTECTION

WATER MANAGEMENT SYSTEM
OPEN VIOLATIONS BY CLIENT

Client ID: 32900
Client: All

Open Violations: 6

CLIENT ID	CLIENT	PF ID	FACILITY	PF KIND	PF STATUS	INSP PROGRAM	PROGRAM SPECIFIC ID
32900	CONCORDIA LUTH HEALTH & HUMAN CARE	15675	WH COOPER 0	NonCoal	Plugged Unverified	Oil & Gas	019-00552
32900	CONCORDIA LUTH HEALTH & HUMAN CARE	15675	WH COOPER 0	NonCoal	Plugged Unverified	Oil & Gas	019-00552
32900	CONCORDIA LUTH HEALTH & HUMAN CARE	15675	WH COOPER 0	NonCoal	Plugged Unverified	Oil & Gas	019-00552
32900	CONCORDIA LUTH HEALTH & HUMAN CARE	15675	WH COOPER 0	NonCoal	Plugged Unverified	Oil & Gas	019-00552
32900	CONCORDIA LUTH HEALTH & HUMAN CARE	248807	CONCORDIA LUTHERAN HOME	Community	Active	Safe Drinking Water	5100025
32900	CONCORDIA LUTH HEALTH & HUMAN CARE	248807	CONCORDIA LUTHERAN HOME	Community	Active	Safe Drinking Water	5100025

INSP ID	VIOLATION ID	INSPECTION CATEGORY	VIOLATION DATE	VIOLATION CODE	VIOLATION	PF INSPECTOR	INSP REGION
3210113	922932	PF	06/23/2021	OGA3211(G)	WELL PERMITS - POSTING - Failure to post the well permit number and the operator's name, address and phone number at the well site during construction of the access road, site preparation and during drilling, operating or alteration of well.		OG - NWRO
3210113	922933	PF	06/23/2021	OGA3211(H)	WELL PERMITS - LABELING - Failure to install, in a permanent manner, the permit number on a completed well.		OG - NWRO
3210113	922934	PF	06/23/2021	78.121(A)	WELL REPORTING – PRODUCTION REPORTING – Conventional operator failed to submit annual conventional production and status report for permitted or registered well.		OG - NWRO
3210113	922935	PF	06/23/2021	78.103	INACTIVE STATUS - ANNUAL MONITORING OF INACTIVE WELLS – Owner or operator failed to monitor well integrity on an annual basis, give prior 3 day notice, follow required method and submit monitoring reports by March 31.		OG - NWRO
3329906	946881	PF	02/18/2022	C2B	FAILURE TO FOLLOW APPROVED METHODS FOR SAMPLING AND ANALYSIS	ORR,CHRISTOPHER	NWRO
3329906	946882	PF	02/18/2022	C1A	FAILURE TO MEET DESIGN AND CONSTRUCTION STANDARDS	ORR,CHRISTOPHER	NWRO

Attachment 2

WQM 7.0 Effluent Limits (Perennial Reach Model)

SWP Basin	Stream Code	Stream Name
18F	42565	LITTLE BUFFALO 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)
7.500	Concordia	PA0090182c	0.135	CBOD5	12.87		
				NH3-N	4.77	9.54	
				Dissolved Oxygen			2

The results for CBOD5 and Dissolved Oxygen are the same as the inputs from the Dry Reach Model, so the Dry Reach Model inputs are protective.

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

Ct = 4.77 mg/l
$k = 0.7\ days^{-1}$ = constant for NH3-N
t = 0.343 days = Dry Reach Model travel time

Therefore, $4.77\ Mg/l = (Ct)e-[(0.7\ days^{-1})(0.343\ days)]$

Ct = 6.06

NH3-N = 6.0 mg/l

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 D.O.Simulation

SWP Basin	Stream Code	Stream Name
18F	42565	LITTLE BUFFALO CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
7.500	0.135	25.000	7.100
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
10.832	0.466	23.229	0.121
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
5.73	0.388	1.64	1.029
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.102	24.285	Owens	5
Reach Travel Time (days)			
2.154			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.215	5.16	1.31	7.54
0.431	4.64	1.05	7.54
0.646	4.18	0.84	7.54
0.862	3.76	0.67	7.54
1.077	3.38	0.54	7.54
1.293	3.05	0.43	7.54
1.508	2.74	0.35	7.54
1.724	2.47	0.28	7.54
1.939	2.22	0.22	7.54
2.154	2.00	0.18	7.54

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
18F	42565	LITTLE BUFFALO CREEK	**7.500**	1201.00	4.00	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	25.00	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
Concordia	PA0090182c	0.1350	0.0000	0.0000	0.000	25.00	7.40

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	12.87	2.00	0.00	1.50
Dissolved Oxygen	2.00	8.24	0.00	0.00
NH3-N	17.28	0.00	0.00	0.70

(from Dry Reach 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
18F	42565	LITTLE BUFFALO CREEK	**3.250**	1045.00	7.10	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	25.00	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	0.00	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
18F	42565	LITTLE BUFFALO 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
7.500	Concordia	9.71	21.61	9.71	21.61	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
7.500	Concordia	1.32	4.77	1.32	4.77	1	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)		
7.50	Concordia	12.87	12.87	4.77	4.77	2	2	0	0

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
18F	42565	LITTLE BUFFALO CREEK

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												
7.500	0.40	0.00	0.40	.2088	0.00695	.466	10.83	23.23	0.12	2.154	25.00	7.10
Q1-10 Flow												
7.500	0.26	0.00	0.26	.2088	0.00695	NA	NA	NA	0.10	2.506	25.00	7.14
Q30-10 Flow												
7.500	0.54	0.00	0.54	.2088	0.00695	NA	NA	NA	0.14	1.913	25.00	7.08

WQM 7.0 D.O.Simulation (Dry Reach Model)

SWP Basin	Stream Code	Stream Name
18F	42565	LITTLE BUFFALO CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
1.080	0.135	25.000	7.389
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
2.322	0.475	4.886	0.192
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
24.59	1.500	24.59	1.029
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
3.967	32.060	Owens	2
Reach Travel Time (days)			
0.343			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.034	23.05	23.74	2.00
0.069	21.60	22.91	2.00
0.103	20.25	22.12	2.00
0.137	18.98	21.35	2.00
0.172	17.79	20.61	2.00
0.206	16.67	19.90	2.00
0.240	15.63	19.21	2.00
0.274	14.65	18.54	2.00
0.309	13.73	17.90	2.00
0.343	12.87	17.28	2.00

(input into Perennial Stream 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
18F	42565	LITTLE BUFFALO CREEK	**1.080**	1323.00	0.05	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	0.070	0.00	0.00	0.000	0.000	0.0	0.00	0.00	25.00	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
Concordia	PA0090182	0.1350	0.0000	0.0000	0.000	25.00	7.40

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
18F	42565	LITTLE BUFFALO CREEK	**0.000**	1201.00	0.34	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	0.070	0.00	0.00	0.000	0.000	0.0	0.00	0.00	25.00	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	0.00	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
18F	42565	LITTLE BUFFALO CREEK

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												
1.080	0.00	0.00	0.00	NA	0.02139	.475	2.32	4.89	0.19	0.343	25.00	7.39
Q1-10 Flow												
1.080	0.00	0.00	0.00	NA	0.02139	NA	NA	NA	0.00	0.000	0.00	0.00
Q30-10 Flow												
1.080	0.00	0.00	0.00	NA	0.02139	NA	NA	NA	0.00	0.000	0.00	0.00