pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northwest Regional Office
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Application Type	**Renewal**	Application No.	**PA0031879**
Facility Type	**Non-Municipal**	APS ID	**1037813**
Major / Minor	**Minor**	Authorization ID	**1353004**

Applicant and Facility Information

Applicant Name	**Pittsburgh District Church of the Nazarene**	Facility Name	**Mt Chestnut Nazarene Retreat Center**
Applicant Address	177 North Road	Facility Address	177 North Rd Mt Chestnut District Center
	Butler, PA 16001-0281		Butler, PA 16001-0281
Applicant Contact	Colleen Baker	Facility Contact	Colleen Baker
Applicant Phone	(724) 287-5867	Facility Phone	(724) 287-5867
Applicant E Mail	~~pghdistcenteradmin@zoominternet.net~~	Facility E Mail	center@pghnz,org
Client ID	280186	Site ID	447551
Municipality	Franklin Township	County	Butler
Ch 94 Status	Not Overloaded	Connection Status	Not Overloaded
Date Application Received	April 13, 2021	EPA Waived?	Yes
Date Application Accepted	May 5, 2021	If No, Reason	

Purpose of Application: NPDES permit renewal

Summary of Review

No open violations. The facility was cited for NPDES permit effluent violations in 2019. *There are no open violations in WMS as of 10/3/2023 CWY*

Sludge hauling contractor is K&M Septic. No recent sludge removal was reported.

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		William H. Mentzer William H. Mentzer, P.E. Environmental Engineering Specialist	August 14, 2023
X		Chad W. Yurisic Chad W. Yurisic, P.E. Environmental Engineer Manager	10/3/2023

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.0295
Latitude DP	40° 53’ 47.40”	Longitude DP	79° 59’ 23.90”
Latitude NHD	40° 53’ 47.08”	Longitude NHD	79° 59’ 22.17”
Quad Name	Mount Chestnut	Quad Code	1106
Wastewater:	Treated church center domestic wastes		

Receiving Waters	Unnamed Tributary of Mulligan Run	Stream Code	34997
NHD Com ID	126220926	RMI	0.42
Drainage Area	0.22	Yield (cfs/mi^2)	0.076
Q_{7-10} Flow (cfs)	0	Q_{7-10} Basis	Dry stream
Elevation (ft)	1268.00	Slope (ft/ft)	0.03
Watershed No.	20-C	Chapter 93 Class.	CWF
Existing Use	Statewide	Existing Use Qualifier	none
Exceptions to Use	none	Exceptions to Criteria	none

Comments: Drainage swale discharge at RMI 0.04 Elev1272.36 feet & Drainage 0.022 sq mi 14.3-acres
Perennial stream at confluence with tributary 34996 at RMI 0.27 El 1166.63 ft Drn 3.1 sq mi
Confluence with Mulligan Run drainage 4.2 squre miles RMI 1.90 Elevation 1110.69 feet

Low Flow Basis: Slippery Rock at Wurtemburg, PA (1913 - 96) Number: RMI:
Low Flow (cfs): 30.2 Drainage (sq-mi): 398 Yield (cfs/sq-mi): 0.076

Assessment Status	Attaining Use(s)		
Cause(s) of Impairment			
Source(s) of Impairment			
TMDL Status	Final, 04/09/2009	Name	Little Connoquenessing Creek Watershed

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

Nearest Downstream Public Water Supply Intake: Harmony Borough

PWS Waters	Little Connoquenessing Creek	Flow at Intake (cfs)	5.15
PWS RMI	1.2773	Distance from Outfall (mi)	12.4

Changes Since Last Permit Issuance: none

Treatment Facility Summary				
Treatment Facility Name: Mt Chestnut Nazarene Retreat Center - WWTP				
WQM Permit No.	**Issuance Date**			
1091402	1991			
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Secondary With Ammonia And Phosphorus	Activated Sludge	Hypochlorite	0.0295
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.0295	59___	Not Overloaded	Aerobic Digestion	

Changes Since Last Permit Issuance: none

Other Comments:
Late renewal

The facility is operating under WQM permit 1091402 for chemical addition, extended aeration sodium hypochlorite disinfection.

The discharge is to a dry stream. Current regulations expect effluent dissolved oxygen to be at least 6.0-mg/L which is essentially the warm water fishery dissolved oxygen saturation concentration. Previously the dry stream dissolved oxygen requirement was 3-mg/L which was also the assumed effluent dissolved oxygen minimum.

The assumed first aquatic life use is 0.6 mile downstream where the discharge confluences with an un-named perennial stream 34996 at its RMI 0.27, 1.568 square mile drainage, and a 0.119-cfs (0.0769-MGD) stream flow based on a 0.076 cfs per square mile yield for Slippery Rock Creek at Wurttemberg.

			INFLUENT			EFFLUENT						
	Month	Year	Mean MGD	Mean PPD	Max PPD	#	Min mg/L	Mean mg/L	#	Min mgL	Mean mg/L	Max mg/L	#
Annual Average Design			0.0295										
Hydraulic Design													
Organic Design Capacity													
Annual Average		2020	0.0140										
		2019	0.0160										
		2018	0.0120										
Highest Monthly Average	March	2020	0.0250										
pH										6.0		9.0	4
TRC											5		2
Fecal Coliform										1000	200	10000	2
BOD5											5		2
TSS											30	60	2
NH3N											7.5	15	2
N											Report		2
P											2	4	2

Effluent data similar to NPDES requirements is not the expected effluent quality.

Compliance History

DMR Data for Outfall 001 (from July 1, 2022 to June 30, 2023)

Parameter	JUN-23	MAY-23	APR-23	MAR-23	FEB-23	JAN-23	DEC-22	NOV-22	OCT-22	SEP-22	AUG-22	JUL-22
Flow (MGD) Average Monthly	0.0072	0.006624	0.007	0.02	0.01008	0.0173	0.014	0.001	0.01	0.014	0.01368	0.012
Flow (MGD) Daily Maximum	0.0072	0.0072	**0.036**	0.029	0.0144	0.0216	0.022	**0.0288**	0.012	0.014	0.022	0.018
pH (S.U.) Minimum	6.2	6.29	6.8	6.62	7.1	6.9	7.2	6.6	6.7	6.7	7.5	7.3
pH (S.U.) Instant Maximum	7.4	7.96	7.9	7.6	8.26	7.9	8.1	7.8	7.6	7.9	7.9	8.0
DO (mg/L) Minimum	5.2	4.2	6.1	5.2	6.2	7.1	6.0	4.97	4.5	5.5	4.8	4.9
TRC (mg/L) Average Monthly	0.1	0.2	0.19	0.18	0.23	0.12	0.25	0.2	0.2	0.18	0.3	0.21
CBOD5 (mg/L) Average Monthly	< 3.0	< 3.4	21.45	13.0	6.75	< 4.35	< 3.0	< 3.0	< 3.0	< 3.0	< 3	< 3.0
TSS (mg/L) Average Monthly	< 5	< 3.5	16.5	31.5	< 9	< 3	< 3.0	< 3	< 3	3	< 3	< 4
Fecal Coliform (#/100 ml) Geo Mean	3.74	44.5	6.33	< 9.5	70.65	> 2420	> 2420	> 2420	8	6	27.8	22.3
Total Nitrogen (mg/L) Average Monthly	22.55	6.9	6.205	10.7	5.305	2.465	1.92	1.86	3.8	7.63	5.36	10.45
Ammonia (mg/L) Average Monthly	< 0.13	< 0.16	1.27	3.27	< 0.96	< 0.135	< 0.11	< 0.11	< 0.11	< 0.2	0.345	0.78
Total Phosphorus (mg/L) Average Mon	2.0	0.45	0.925	0.88	0.88	0.52	0.67	0.525	0.5	0.65	0.785	0.7

High fecals November through December and high TSS in March

Compliance History

Effluent Violations for Outfall 001, from: August 1, 2022 To: June 30, 2023

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
TSS	03/31/23	Avg Mo	31.5	mg/L	30	mg/L
Fecal Coliform	01/31/23	Geo Mean	> 2420	CFU/100 ml	2000	CFU/100 ml
Fecal Coliform	11/30/22	Geo Mean	> 2420	CFU/100 ml	2000	CFU/100 ml
Fecal Coliform	12/31/22	Geo Mean	> 2420	CFU/100 ml	2000	CFU/100 ml

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** .0295
Latitude 40º 53' 47.40" **Longitude** -79º 59' 23.90"
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)
Total Residual Chlorine	0.5	Average Monthly	-	92a.48(b)(2)
DO	4.0	Daily minimum		BPJ
E Coli	Report			BPJ
Nitrogen	Report			Monitoring

Comments: E Coli monitoring proposed. Nitrogen monitoring to be continued.

Water Quality-Based Limitations

A Sewerage Program "Reasonable Potential Analysis" determined: ammonia-nitrogen, phosphorus, and Total Residual Chlorine (TRC) were candidates for limitations:

The following limitations were determined through water quality modeling (output files attached):

Parameter		Limit (mg/l)			SBC	Model		
Name	Period	Minimum	Average	Maximum		Minimum	Average	Maximum
CBOD5	All year		25.0	50.0			25.0	50.0
Ammonia	Summer		2.5	5.0			2.47	4.94
	Winter		7.5	15.0			5.41	10.82
Dissolved Oxygen	All Year	4.0				6.0		

The TRC spreadsheet calculated an average limit of 0.4 mg/L and an instantaneous maximum limit of 1.2 mg/L. These limits are attainable and will be incorporated into the renewed permit.

The basin discharges have a 2.0-mg/L monthly average and 4.0-mg/L maximum phosphorus limitation.

The receiving waters are not listed as impaired and the initial modelling assuming a 3.0-mg/L dry stream DO goal with WQM6.3 recommended a 3.0-mg/L technology-based DO limitation. With no listed impairment DO greater than 4.0-mg/L is not necessary according to the Department's Rules and Regulations.

For CBOD5, ammonia and DO modelling multiple reach model based on tributary 34996 was used. Tributary 34997 is assumed to be an intermittent stream.

Best Professional Judgment (BPJ) Limitations

Comments: This is an activated sludge biological treatment facility with aeration that should provide an effluent DO greater than 4.0-mg/L.

Anti-Backsliding

With water-quality based limit compliance there is no need for backsliding.

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	34996	Trib 34996 to Mulligan Run	**0.690**	1268.00	0.22	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	0.076	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.50	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

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	34996	Trib 34996 to Mulligan Run	**0.720**	1272.36	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	0.076	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.50	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
Church of the N	PA0031879	0.0295	0.0295	0.0295	0.000	20.00	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	8.24	0.00	0.00
NH3-N	25.00	0.10	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	34996	Trib 34996 to Mulligan Run	**0.270**	1166.63	1.58	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	0.076	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.50	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

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	34996	Trib 34996 to Mulligan Run	**0.000**	1110.69	4.17	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	0.076	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.50	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
20C	34996	Trib 34996 to Mulligan 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												
0.720	0.00	0.00	0.00	.0456	0.02753	.393	1.16	2.95	0.10	0.018	20.00	7.21
0.690	0.02	0.00	0.02	.0456	0.04571	.345	2.42	7.02	0.07	0.345	20.00	7.26
0.270	0.12	0.00	0.12	.0456	0.03924	.398	5.06	12.71	0.08	0.200	20.00	7.39
Q1-10 Flow												
0.720	0.00	0.00	0.00	.0456	0.02753	NA	NA	NA	0.10	0.018	20.00	7.20
0.690	0.01	0.00	0.01	.0456	0.04571	NA	NA	NA	0.07	0.365	20.00	7.24
0.270	0.08	0.00	0.08	.0456	0.03924	NA	NA	NA	0.07	0.237	20.00	7.36
Q30-10 Flow												
0.720	0.00	0.00	0.00	.0456	0.02753	NA	NA	NA	0.10	0.018	20.00	7.21
0.690	0.02	0.00	0.02	.0456	0.04571	NA	NA	NA	0.08	0.327	20.00	7.28
0.270	0.16	0.00	0.16	.0456	0.03924	NA	NA	NA	0.09	0.176	20.00	7.41

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		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
20C	34996	Trib 34996 to Mulligan 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
0.720	Church of the N	NA	50	8.2	9.88	2	80
0.690		NA	NA	7.9	NA	NA	NA
0.270		NA	NA	6.95	NA	NA	NA

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
0.720	Church of the N	NA	25	1.7	2.47	2	90
0.690		NA	NA	1.63	NA	NA	NA
0.270		NA	NA	1.51	NA	NA	NA

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)		
0.72	Church of the N	25	25	2.47	2.47	6	6	0	0
0.69		NA	NA	NA	NA	NA	NA	NA	NA
0.27		NA	NA	NA	NA	NA	NA	NA	NA

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
20C	34996	Trib 34996 to Mulligan Run

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
0.720	0.030	20.000	7.207
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
1.160	0.393	2.954	0.103
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
24.26	1.496	2.39	0.700
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.072	26.745	Owens	NA
Reach Travel Time (days)			
0.018			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.002	24.19	2.39	6.11
0.004	24.13	2.39	6.14
0.005	24.07	2.38	6.17
0.007	24.00	2.38	6.21
0.009	23.94	2.38	6.24
0.011	23.88	2.38	6.27
0.012	23.81	2.37	6.29
0.014	23.75	2.37	6.32
0.016	23.69	2.37	6.35
0.018	23.62	2.36	6.37

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
0.690	0.030	20.000	7.262
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
2.424	0.345	7.020	0.074
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
18.35	1.443	1.79	0.700
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.828	27.219	Owens	6
Reach Travel Time (days)			
0.345			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.034	17.46	1.74	7.26
0.069	16.62	1.70	7.47
0.103	15.81	1.66	7.60
0.138	15.04	1.62	7.69
0.172	14.31	1.58	7.76
0.207	13.62	1.54	7.83
0.241	12.96	1.51	7.89
0.276	12.33	1.47	7.95
0.310	11.73	1.44	8.00
0.345	11.16	1.40	8.05

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
20C	34996	Trib 34996 to Mulligan Run

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
0.270	0.030	20.000	7.395
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
5.056	0.398	12.709	0.082
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
5.45	1.055	0.53	0.700
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
8.171	22.418	Owens	6
Reach Travel Time (days)			
0.200			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.020	5.33	0.52	8.24
0.040	5.22	0.51	8.24
0.060	5.11	0.51	8.24
0.080	5.01	0.50	8.24
0.100	4.90	0.49	8.24
0.120	4.80	0.49	8.24
0.140	4.70	0.48	8.24
0.160	4.60	0.47	8.24
0.180	4.50	0.47	8.24
0.200	4.41	0.46	8.24

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
20C	34996	Trib 34996 to Mulligan 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)
0.720	Church of the N	PA0031879	0.030	CBOD5	25		
				NH3-N	2.47	4.94	
				Dissolved Oxygen			6

TRC_CALC.xls

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

0.12	= Q stream (cfs)	0.5	= CV Daily
0.0295	= 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)		=Decay Coefficient (K)

Source	Reference	AFC Calculations	Reference	CFC Calculations
TRC	1.3.2.iii	WLA afc = 0.858	1.3.2.iii	WLA cfc = 0.829
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 0.320	5.1d	LTA_cfc = 0.482

Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AML MULT = 1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.393	AFC
		INST MAX LIMIT (mg/l) = 1.287	

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)**

Proposed Effluent Limitations and Monitoring Requirements

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

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	1/week	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	4.0 Daily Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.4	XXX	1.2	1/day	Grab
CBOD5	XXX	XXX	XXX	25.0	XXX	50.0	2/month	8-Hr Composite
TSS	XXX	XXX	XXX	30.0	XXX	60.0	2/month	8-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/month	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/year	Grab
Total Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Ammonia Nov 1 - Apr 30	XXX	XXX	XXX	7.5	XXX	15.0	2/month	8-Hr Composite
Ammonia May 1 - Oct 31	XXX	XXX	XXX	2.5	XXX	5.0	2/month	8-Hr Composite
Total Phosphorus	XXX	XXX	XXX	2.0	XXX	4,0	2/month	8-Hr Composite

Compliance Sampling Location: Outfall 001 after disinfection

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Approve	Deny	Signatures	Date
X		William H. Mentzer William H. Mentzer, P.E. Environmental Engineering Specialist	August 14, 2023
X		Chad W. Yurisic Chad W. Yurisic, P.E. Environmental Engineer Manager	10/3/2023