pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Application Type	**Renewal**	Application No.	**PA0082511**
Facility Type	**Non-Municipal**	APS ID	**337669**
Major / Minor	**Minor**	Authorization ID	**1437628**

Applicant and Facility Information

Applicant Name	**Roxbury Holiness Camp Inc.**	Facility Name	**Roxbury Holiness Camp**
Applicant Address	13763 Cumberland Highway	Facility Address	13763 Cumberland Highway
	Orrstown, PA 17244-9640		Orrstown, PA 17244-9640
Applicant Contact	Jeremy Spear	Facility Contact	Dale Winger
Applicant Phone	(717) 532-2208	Facility Phone	(717) 532-2208
Client ID	147576	Site ID	837
Ch 94 Load Status	Not Overloaded	Municipality	Letterkenny Township
Connection Status		County	Franklin
Date Application Received	April 25, 2023	EPA Waived?	Yes
Date Application Accepted	June 1, 2023	If No, Reason	

Purpose of Application: NPDES Renewal.

Summary of Review

Roxbury Holiness Camp Inc., has applied to the Pennsylvania Department of Environmental Protection (DEP) for reissuance of its NPDES permit. The permit was reissued on October 29, 2018 and became effective on November 1, 2018. The permit expired on October 31, 2023 but the terms and conditions of the permit have been extended since that time.

Based on the review, it is recommended that the permit be drafted.

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		*Jinsu Kim* Jinsu Kim / Environmental Engineering Specialist	April 4, 2024
X		Maria D. Bebenek Daniel W. Martin, P.E. / Environmental Engineer Manager	April 17, 2024
X		Maria D. Bebenek Maria D. Bebenek, P.E. / Program Manager	April 17, 2024

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	.03
Latitude	40º 6' 29.47"	Longitude	-77º 39' 51.44"
Quad Name		Quad Code	
Wastewater Description:	Sewage Effluent		
Receiving Waters	Conodoguinet Creek	Stream Code	10194
NHD Com ID	56409227	RMI	82.83
Drainage Area	42.2 sq.mi.	Yield (cfs/mi^2)	0.0755
Q_{7-10} Flow (cfs)	3.19	Q_{7-10} Basis	USGS StreamStats
Elevation (ft)		Slope (ft/ft)	
Watershed No.	7-B	Chapter 93 Class.	CWF
Existing Use	None	Existing Use Qualifier	None
Exceptions to Use	None	Exceptions to Criteria	None
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment	N/A		
Source(s) of Impairment	N/A		
TMDL Status	N/A	Name	N/A
Nearest Downstream Public Water Supply Intake	Carlisle Borough		
PWS Waters	Conodoguinet Creek	Flow at Intake (cfs)	48
PWS RMI	35.95	Distance from Outfall (mi)	46.88

Drainage Area
The discharge is to Conodoguinet Creek at RMI 82.83. A drainage area upstream of the point of discharge is estimated to be 42.2 cfs according to USGS StreamStats available at https://streamstats.usgs.gov/ss/.

Stream Flow
USGS StreamStats produced a Q7-10 flow of 3.19 cfs at the point of discharge.

Conodoguinet Creek
Under Pa Code §93.9o, Conodoguinet Creek from Letterkenny Reservoir Dam to Trout Run is designated as Cold Water and Migratory fishes. No special protection water(s) is therefore impacted by this discharge. DEP's latest integrated water quality report finalized in 2024 indicates that the discharge is located in a stream segment listed as attaining use(s). No Class A Wild Trout Fishery is impacted by the discharge.

Public Water Supply Intake
The fact sheet prepared for the last permit renewal indicates that the nearest downstream public water supply intake is Carlisle Borough in North Middleton Township, located on Conodoguinet Creek approximately 47 miles from the discharge point. Given the distance, the discharge is not expected to significantly impact the water supply intake.

Treatment Facility Summary				
Treatment Facility Name: Brethren In Christ - Roxbury Camp Sewer System				
WQM Permit No.	**Issuance Date**			
2891404	March 18, 1992			
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Secondary	Septic Tank Sand Filter	Hypochlorite	0.03
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.03	-	Not Overloaded	N/A	Other WWTP

Roxbury Holiness Camp is a seasonal camp site but also includes a year-round residence and conference center. The permittee operates an on-site wastewater treatment facility consisting of septic tank, dosing tank, sand filters (4), chlorine contact tank and outfall to Conodoguinet Creek. Any solids/sludge generated from this treatment facility is hauled off site via a local septage hauler for disposal at a local WWTP.

Calcium hypochlorite tablets are used for chlorination.

Compliance History	
Summary of DMRs:	A summary of 12-month DMR is presented on the next page.
Summary of Inspections:	01/25/2023: DEP conducted a routine inspection and indicated that no significant violations have been identified at the time of inspection.
Other Comments:	DEP identified several permit violations since the last permit reissuance that are associated with last DMR submission. DEP's database shows there is no open violation associated with this permittee or facility.

Effluent Data

DMR Data for Outfall 001 (from March 1, 2023 to February 29, 2024)

Parameter	FEB-24	JAN-24	DEC-23	NOV-23	OCT-23	SEP-23	AUG-23	JUL-23	JUN-23	MAY-23	APR-23	MAR-23
Flow (MGD) Average Monthly	0.01674	0.02974	0.0173	0.00716	0.00795	0.00576	0.01206	0.01371	0.00891	0.00172	0.01076	0.01531
Flow (MGD) Daily Maximum	0.07166	0.10262	0.07178	0.04236	0.0427	0.03687	0.03134	0.03709	0.01988	0.00541	0.05971	0.08319
pH (S.U.) Daily Minimum	6.8	7.0	6.7	6.5	6.6	6.7	7.2	6.7	6.9	6.8	6.9	6.9
pH (S.U.) Daily Maximum	7.6	7.6	7.4	7.6	7.5	7.9	8.1	7.8	10.1	7.9	7.7	7.7
DO (mg/L) Daily Minimum	7.2	7.8	8.7	2.8	4	4.6	6.3	4.4	5.1	6.0	6.5	9.1
TRC (mg/L) Average Monthly	0.1	< 0.3	0.2	0.11	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
TRC (mg/L) Instantaneous Maximum	0.55	1.41	0.86	0.22	0.26	0.2	0.6	0.56	0.6	0.25	0.47	0.25
CBOD5 (mg/L) Average Monthly	< 2.0	< 2.0	< 2.0	< 2.0	6.0	3.1	24.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TSS (mg/L) Average Monthly	< 1.0	< 1.0	< 1.0	< 1.0	1.3	2.8	5.5	2.5	2.5	3.0	1.3	< 1.5
Fecal Coliform (No./100 ml) Geometric Mean	< 8	< 1	< 1	< 1	< 2	< 2	41	22	< 7	< 1	< 1	< 1
Fecal Coliform (No./100 ml) Instantaneous Maximum	67	< 1	< 1	< 1	4	4	246	29	53	< 1	< 1	< 1
Nitrate-Nitrite (mg/L) Annual Average						< 57.9						
Total Nitrogen (mg/L) Annual Average						< 58.6						
Ammonia (mg/L) Average Monthly	< 0.5	< 0.5	< 0.5	< 0.5	< 0.661	2.407	5.99	3.17	< 0.5	< 0.5	< 0.5	< 0.5
TKN (mg/L) Annual Average						< 0.5						
Total Phosphorus (mg/L) Annual Average						2.37						

Existing Effluent Limits and Monitoring Requirements

The table below summarizes effluent limits and monitoring requirements specified in the existing permit.

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	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	9.0 Daily Max	XXX	1/day	Grab
Dissolved Oxygen	XXX	XXX	Report Daily Min	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	XXX	XXX	XXX	25.0	XXX	50	2/month	24-Hr Composite
Total Suspended Solids	XXX	XXX	XXX	30.0	XXX	60	2/month	24-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
Ammonia-Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	2/month	24-Hr Composite
Kjeldahl--N	XXX	XXX	XXX	Report	XXX	XXX	1/year	24-Hr Composite
Nitrate-Nitrite as N	XXX	XXX	XXX	Report	XXX	XXX	1/year	24-Hr Composite
Total Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	1/year	Calculation
Total Phosphorus	XXX	XXX	XXX	Report	XXX	XXX	1/year	24-Hr Composite

Development of Effluent Limitations and Monitoring Re

Outfall No. 001 **Design Flow (MGD)** .03
Latitude 40º 6' 30.00" **Longitude** -77º 39' 52.00"
Wastewater Description: Sewage Effluent

Technology-Based Limitations

The following technology-based limitations apply, subject to water quality analysis and BPJ where applicable:

Pollutant	Limit (mg/l)	SBC	Federal Regulation	State Regulation
$CBOD_5$	25	Average Monthly	133.102(a)(4)(i)	92a.47(a)(1)
	40	Average Weekly	133.102(a)(4)(ii)	92a.47(a)(2)
Total Suspended Solids	30	Average Monthly	133.102(b)(1)	92a.47(a)(1)
	45	Average Weekly	133.102(b)(2)	92a.47(a)(2)
pH	6.0 – 9.0 S.U.	Min – Max	133.102(c)	95.2(1)
Fecal Coliform (5/1 – 9/30)	200 / 100 ml	Geo Mean	-	92a.47(a)(4)
Fecal Coliform (5/1 – 9/30)	1,000 / 100 ml	IMAX	-	92a.47(a)(4)
Fecal Coliform (10/1 – 4/30)	2,000 / 100 ml	Geo Mean	-	92a.47(a)(5)
Fecal Coliform (10/1 – 4/30)	10,000 / 100 ml	IMAX	-	92a.47(a)(5)
Total Residual Chlorine	0.5	Average Monthly	-	92a.48(b)(2)

Water Quality-Based Limitations

CBOD5, NH3-N and Dissolved Oxygen (DO)
WQM 7.0 version 1.0b is a water quality model designed to assist DEP to determine appropriate permit requirements for CBOD5, NH3-N and DO. DEP's guidance no. 391-2000-007 provides the technical methods contained in WQM 7.0 for conducting wasteload allocation and for determining recommended NPDES effluent limits for point source discharges. A multi-discharge analysis is necessary as Letterkenny Township WWTP is located less than a mile downstream from this facility. The model was utilized and the model output indicated that existing TBEL of 25 mg/L for CBOD5 is still appropriate. The output also indicated that no WQBEL is need for NH3-N.

Total Residual Chlorine
Since chlorine is used for disinfection, Total Residual Chlorine (TRC) effluent levels must be regulated in accordance with 25 Pa Code §92a.48(b). DEP's TRC_CALC worksheet indicates that existing limits of 0.5 mg/L (average monthly) and 1.6 mg/L (IMAX) are still protective of water quality.

Toxics
DEP's NPDES permit application for minor sewages less than 0.1 MGD does not require sampling of toxics pollutants. As a result, no reasonable potential analysis for toxics pollutants has been performed for the upcoming permit renewal.

Additional Considerations

Flow Monitoring
The requirement to monitor the volume of effluent will remain in the draft permit per 40 CFR § 122.44(i)(1)(ii).

Dissolved Oxygen and Ammonia-Nitrogen Monitoring
The previous permit renewals prior to 2006 contained effluent limits of NH3-N (15 mg/L summer average monthly; 30 mg/L winter average monthly) and DO (3.0 mg/L instantaneous maximum). When the permit was reissued in 2006, these effluent limits were no longer included in the permit. The basis is unclear; however, it is presumably because of treatment technology of the existing on-site treatment facility (i.e. septic tank and sand filters). Such treatment technology typically involves no

aeration; thus, no effective nitrification can be expected throughout the treatment process. However, all sewage discharges greater than 0.002 MGD require monitoring of DO and NH3-N. This approach is consistent with DEP's SOP no. BPNPSM-PMT-033. Samples previously collected by the permittee showed Total Nitrogen of 60.6 m/L (sample dated 09/15/2015), 6.06 mg/L (sample dated 02/07/2017), 4.93 mg/L (in 2017). At this time, there are no known impairments associated with DO or nutrients in Conodoguinet Creek at the point of discharge. DEP's SOP no. BPNPSM-PMT-033 recommends a minimum DO water quality criterion of 5.0 mg/L and average monthly NH3-N technology-based effluent limit of 25 mg/L be applied in the permit. Based on the review, monitoring of these parameters is recommended for further evaluation.

Chesapeake Bay TMDL
DEP's Phase II Watershed Implementation Plan (WIP) categorizes this facility as a phase 5 non-significant sewage facility that has a design flow less than 0.2 MGD but greater than 0.002 MGD. The WIP recommends monitoring and reporting for Total Nitrogen and Total Phosphorus throughout the permit term at a frequency no less than annually. The requirement to monitor for these parameters is also recommended by DEP's SOP no. BPNPSM-PMT-033. As part of DEP's Chesapeake Bay TMDL implementation strategy, DEP requires actual long-term datasets to accurately evaluate the water quality impacts of the streams as a result of nutrients discharges from point sources. Consequently, the existing annual monitoring of Total Nitrogen and Total Phosphorus will still be maintained in the permit. Since the receiving stream is not impaired for nutrients, annual data will still be sufficient for further evaluation.

E. Coli Monitoring Requirement
DEP's SOP No. BCW-PMT-033 recommends under 25 Pa Code §92a.61 a routine monitoring for E. Coli in all new and reissued permits. Since the facility has now the annual average design flow of 0.0372 MGD, an annual monitoring will be included in the permit.

Monitoring Frequency and Sample Type
Unless otherwise specified throughout this fact sheet, existing monitoring frequencies and sample types will remain unchanged in the permit.

Antidegradation Requirements
All effluent limitations and monitoring requirements have been developed to ensure that existing instream water uses and the level of water quality necessary to protect the existing uses are maintained and protected.

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	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	9.0 Daily Max	XXX	1/day	Grab
Dissolved Oxygen	XXX	XXX	Report Daily Min	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	XXX	XXX	XXX	25.0	XXX	50	2/month	24-Hr Composite
Total Suspended Solids	XXX	XXX	XXX	30.0	XXX	60	2/month	24-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
Ammonia-Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	2/month	24-Hr Composite
Kjeldahl--N	XXX	XXX	XXX	Report	XXX	XXX	1/year	24-Hr Composite
Nitrate-Nitrite as N	XXX	XXX	XXX	Report	XXX	XXX	1/year	24-Hr Composite
Total Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	1/year	Calculation
Total Phosphorus	XXX	XXX	XXX	Report	XXX	XXX	1/year	24-Hr Composite
E. Coli (no./ 100mL)	XXX	XXX	XXX	XXX	XXX	Report	1/year	Grab

Other Comments: None

Approve	Deny	Signatures	Date
X		*Jinsu Kim* Jinsu Kim / Environmental Engineering Specialist	April 4, 2024
X		Maria D. Bebenek Daniel W. Martin, P.E. / Environmental Engineer Manager	April 17, 2024
X		Maria D. Bebenek Maria D. Bebenek, P.E. / Program Manager	April 17, 2024

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
07B	10194	CONODOGUINET CREEK	**82.830**	725.00	42.20	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	3.19	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
Roxbury Camp	PA0082511	0.0300	0.0300	0.0300	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	5.00	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
07B	10194	CONODOGUINET CREEK	**82.150**	695.00	42.90	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.100	0.00	2.99	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
Letterkenny STP	PA0082201	0.0420	0.0420	0.0420	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

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
07B	10194	CONODOGUINET CREEK	**80.130**	642.00	45.80	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	3.06	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
07B	10194	CONODOGUINET 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												
82.830	3.19	0.00	3.19	.0464	0.00836	.643	27.08	42.09	0.19	0.224	20.07	7.00
82.150	2.99	0.00	2.99	.1114	0.00497	.639	28.06	43.94	0.17	0.713	20.18	7.00
Q1-10 Flow												
82.830	2.04	0.00	2.04	.0464	0.00836	NA	NA	NA	0.15	0.286	20.11	7.00
82.150	1.91	0.00	1.91	.1114	0.00497	NA	NA	NA	0.14	0.905	20.28	7.00
Q30-10 Flow												
82.830	4.34	0.00	4.34	.0464	0.00836	NA	NA	NA	0.22	0.189	20.05	7.00
82.150	4.07	0.00	4.07	.1114	0.00497	NA	NA	NA	0.20	0.604	20.13	7.00

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
07B	10194	CONODOGUINET CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
82.830	0.030	20.072	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
27.078	0.643	42.089	0.186
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.33	0.200	0.36	0.704
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
8.196	14.775	Tsivoglou	5
Reach Travel Time (days)			
0.224			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.022	2.32	0.35	8.23
0.045	2.31	0.35	8.23
0.067	2.30	0.34	8.23
0.089	2.29	0.34	8.23
0.112	2.28	0.33	8.23
0.134	2.27	0.33	8.23
0.157	2.26	0.32	8.23
0.179	2.25	0.32	8.23
0.201	2.24	0.31	8.23
0.224	2.23	0.31	8.23

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
82.150	0.072	20.180	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
28.058	0.639	43.942	0.173
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.72	0.296	0.84	0.710
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
8.122	8.209	Tsivoglou	5
Reach Travel Time (days)			
0.713			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.071	2.66	0.80	8.22
0.143	2.61	0.76	8.22
0.214	2.55	0.72	8.22
0.285	2.50	0.69	8.22
0.357	2.44	0.65	8.22
0.428	2.39	0.62	8.22
0.499	2.34	0.59	8.22
0.570	2.29	0.56	8.22
0.642	2.24	0.53	8.22
0.713	2.20	0.51	8.22

WQM 7.0 Modeling Specifications

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

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
07B	10194	CONODOGUINET 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
82.830	Roxbury Camp	16.61	50	16.61	50	0	0
82.150	Letterkenny STP	16.53	50	16.38	50	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
82.830	Roxbury Camp	1.88	25	1.88	25	0	0
82.150	Letterkenny STP	1.88	25	1.87	25	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)		
82.83	Roxbury Camp	25	25	25	25	5	5	0	0
82.15	Letterkenny STP	25	25	25	25	3	3	0	0

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
07B	10194	CONODOGUINET 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)
82.830	Roxbury Camp	PA0082511	0.030	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			5

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)
82.150	Letterkenny STP	PA0082201	0.042	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			3

TRC_CALC

1A	B	C	D	E	F	G
2	**TRC EVALUATION**					
3	Input appropriate values in B4:B8 and E4:E7					
4	3.19	**= Qstream (cfs)**		**0.5**	**=CV Daily**	
5	0.03	**= Qdischarge (MGD)**		**0.5**	**=CV Hourly**	
6	30	**= no. samples**		**1**	**=AFC_Partial Mix Factor**	
7	0.3	**= Chlorine Demand of Stream**		**1**	**=CFC_Partial Mix Factor**	
8	0	**= Chlorine Demand of Discharge**		**15**	**=AFC_Criteria Compliance Time (min)**	
9	**0.5**	**= BAT/BPJ Value**		**720**	**=CFC_Criteria Compliance Time (min)**	
	0	**= % Factor of Safety (FOS)**			**=Decay Coefficient (K)**	
10	Source	Reference	AFC Calculations		Reference	CFC Calculations
11	TRC	**1.3.2.iii**	WLA afc = 21.946		**1.3.2.ii**	WLA cfc = 21.388
12	PENTOXSD TRG	**5.1a**	LTAMULT afc = 0.373		**5.1c**	LTAMULT cfc = 0.581
13	PENTOXSD TRG	**5.1b**	LTA_afc= 8.177		**5.1d**	LTA_cfc = 12.434
14						
15	Source		Effluent Limit Calculations			
16	PENTOXSD TRG	5.1f	AML MULT = 1.231			
17	PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.500		BAT/BPJ	
18			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)**