pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0024392**
Facility Type	**Municipal**	APS ID	**1021100**
Major / Minor	**Minor**	Authorization ID	**1322756**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Rouseville Borough**	Facility Name	**Rouseville Borough STP**
Applicant Address	P.O. Box 317	Facility Address	Route 8 South, Main Street
	Rouseville, PA 16344-0317		Rouseville, PA 16344
Applicant Contact	Joe Dengel Administrator	Facility Contact	Joe Dengel
Applicant Phone	(814) 677-3056	Facility Phone	(814) 677-3056
Client ID	75173	Site ID	533136
Ch 94 Load Status	Not Overloaded	Municipality	Cornplanter Township
Connection Status	No Limitations	County	Venango
Date Application Received	July 31, 2020	EPA Waived?	Yes
Date Application Accepted	August 13, 2020	If No, Reason	

Purpose of Application: Renewal of a NPDES Permit for an existing discharge of treated municipal sewage.

Summary of Review

This is a municipal POTW treated domestic wastewater from Rouseville Borough, Venango County.

This facility discharges to Oil Creek, which is known to contain threatened and endangered mussel species. A summary of threatened and endangered mussel species concerns and considerations is included on Page 9 of this Fact Sheet.

There are currently no open violations listed in EFACTS for this permittee (5/09/2023). *5/16/2023 CWY*

Sludge use and disposal description and location(s): Sludge is hauled offsite and disposed of at the Franklin WWTP.

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		Adam J. Pesek Adam J. Pesek, E.I.T. / Project Manager	May 9, 2023
X		Chad W. Yurisic Chad W. Yurisic, P.E. / Environmental Engineer Manager	5/16/2023

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.24
Latitude	41º 27' 37"	Longitude	-79º 41' 24"
Quad Name	Oil City	Quad Code	0708
Wastewater Description:	Sewage Effluent		

Receiving Waters	Oil Creek	Stream Code	54128
NHD Com ID	100475857	RMI	2.62
Drainage Area	314	Yield (cfs/mi^2)	0.10
Q_{7-10} Flow (cfs)	31.5	Q_{7-10} Basis	USGS #03020500 ('34-'08)
Elevation (ft)	1.002	Slope (ft/ft)	0.00421
Watershed No.	16-E	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	MERCURY		
Source(s) of Impairment	SOURCE UNKNOWN		
TMDL Status	**Pending**	Name	

Background/Ambient Data		Data Source
pH (SU)	7.55	WQN 868
Temperature (°C)	25	Default
Hardness (mg/L)		
Other: NH_3-N	0.026	WQN 868
Other: $CBOD_5$	1.1	WQN 868

Nearest Downstream Public Water Supply Intake		Aqua Pennsylvania, Inc. – Emlenton	
PWS Waters	Allegheny River	Flow at Intake (cfs)	1450
PWS RMI	90	Distance from Outfall (mi)	40

Changes Since Last Permit Issuance:

Other Comments:

Treatment Facility Summary

Treatment Facility Name: Rouseville Borough STP

WQM Permit No.	Issuance Date
6102401	4/01/2002
6110402	3/09/2011

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary With Ammonia Reduction	Sequencing Batch Reactor	Hypochlorite	0.24

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.24	454	Not Overloaded	Aerobic Digestion	Other WWTP

Changes Since Last Permit Issuance: A permit amendment application for WQM permit No. 6110402 was submitted on 3/14/2023 for obtaining and incorporating a portable septage receiving station at the facility.

Other Comments:

Compliance History	
Summary of Inspections:	Last site inspection was conducted on 4/28/2021. The inspection report noted the Borough was working on a GIS map of the collection system and working on and I/I maintenance schedule. Smoke testing and line jetting were also being performed. The report also noted that the effluent actuator was not working in SBR 1, which should be fixed as well as cleaning out the chlorine contact tanks.

Other Comments:

Compliance History

DMR Data for Outfall 001 (from March 1, 2022 to February 28, 2023)

Parameter	FEB-23	JAN-23	DEC-22	NOV-22	OCT-22	SEP-22	AUG-22	JUL-22	JUN-22	MAY-22	APR-22	MAR-22
Flow (MGD) Average Monthly	0.137	0.142	0.0021	0.0	0.017	0.090	0.058	0.078	0.089	0.179	0.193	0.203
Flow (MGD) Daily Maximum	0.351	0.478	0.047	0.0	0.078	0.338	0.105	0.123	0.184	0.541	0.344	0.692
pH (S.U.) Minimum	6.2	6.5	6.3	6.5	6.6	6.6	6.7	6.6	6.5	6.5	6.7	6.7
pH (S.U.) Maximum	6.9	7.1	7.6	7.0	7.1	7.1	7.2	7.2	7.1	7.0	7.1	8.5
DO (mg/L) Minimum	6.6	4.9	4.9	4.2	4.3	4.6	4.4	4.2	5.1	5.4	7.8	8.5
TRC (mg/L) Average Monthly	0.13	0.35	0.3	0.37	0.35	0.21	0.17	0.21	0.28	0.27	0.22	0.4
TRC (mg/L) Instantaneous Maximum	0.3	1.3	0.97	1.03	1.46	0.45	0.28	0.35	1.0	0.94	0.49	2.0
CBOD5 (lbs/day) Average Monthly	5	6	1	48	3	7	8	4	6	10	14	16
CBOD5 (lbs/day) Weekly Average	5	9	2	49	6	9	10	8	9	13	19	47
CBOD5 (mg/L) Average Monthly	4	4	3	8	10	8	15	6	10	8	7	7
CBOD5 (mg/L) Weekly Average	6	8	5	13	12	14	18	18	20	12	8	11
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	75	17	10	382	12	30	21	< 19	30	45	118	60
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	180	42	19	430	25	68	28	< 30	37	63	235	139
BOD5 (mg/L) Raw Sewage Influent Average Monthly	48.9	16.1	74.9	50.3	48.4	26	37	< 28	45	35	64	32
TSS (lbs/day) Average Monthly	11	40	1	58	2	10	5	6	10	11	29	62

TSS (lbs/day) Raw Sewage Influent Average Monthly	77	48	1	525	38	46	43	29	66	57	134	68
TSS (lbs/day) Raw Sewage Influent Daily Maximum	123	71	2	751	38	90	60	47	100	82	243	109
TSS (lbs/day) Weekly Average	8	98	2	75	5	25	7	13	20	18	55	219
TSS (mg/L) Average Monthly	7	25	7	11	7	8	8	11	19	7	14	23
TSS (mg/L) Raw Sewage Influent Average Monthly	63	40	7	95	87	44	73	41	95	52	75	48
TSS (mg/L) Weekly Average	9	67	11	13	9	10	12	28	42	9	22	38
Fecal Coliform (CFU/100 ml) Geometric Mean	10	10	10	26	49	239	63	710	19	53	318	1457
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	10	10	10	703	5900	7000	390	93000	126	6727	1100	27000
Total Nitrogen (lbs/day) Average Quarterly			1			2			2			14
Total Nitrogen (mg/L) Average Quarterly			3.13			0.354			2.31			9.2
Ammonia (lbs/day) Average Monthly	0.4	0.1	0.0008	7	0.4	0.3	0.06	< 0.1	1	0.10	0.2	51.05
Ammonia (mg/L) Average Monthly	0.2	0.1	0.5	0.8	0.8	0.354	0.1	< 0.2	2.0	0.10	0.14	1.05
Total Phosphorus (lbs/day) Average Quarterly			0.06			0.06			0.1			0.4
Total Phosphorus (mg/L) Average Quarterly			0.16			0.1			0.17			0.28

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.24
Latitude 41º 27' 37.00" **Longitude** -79º 41' 24.00"
Wastewater Description: Treated domestic sewage

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)
E. Coli	Report (No./100 ml)	IMAX	-	92a.61

Comments: Monitoring for E. coli is placed in the permit in accordance with the Department's SOP entitled "Establishing Effluent Limitations for Individual Sewage Permits."

Water Quality-Based Limitations

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

Parameter	Limit (mg/l)	SBC	Model
N/A			

Comments: No WQBELs were calculated as a result of WQM modeling.

Best Professional Judgment (BPJ) Limitations

Comments: Monitoring for influent BOD_5 and influent TSS is placed in the permit in accordance with the Department's SOP entitled "New and Reissuance Individual Sewage NPDES Permit Applications."

A minimum D.O. limit of 4.0 mg/l, an IMAX TRC limit of 1.6 mg/l, and monitoring for ammonia nitrogen, total nitrogen, and total phosphorus are placed in the permit in accordance with the Department's SOP entitled "Establishing Effluent Limitations for Individual Sewage Discharges."

Mercury Impairment

The receiving stream reach is impaired for total mercury. Due to this impairment, and evaluation of the effluent was conducted to determine if monitoring was necessary in the renewed permit. Below is effluent sampling results from the renewal application that was used for the evaluation.

Unit	Most stringent criteria	Sample 1	Sample 2	Sample 3
ug/l	0.05	0.0021	0.0027	0.0035

As can be seen from the table, all three effluent results were well below the most stringent WQ criterion for total mercury. Therefore, the Department has no reason to believe that this discharge is contributing to the impairment. No monitoring will be placed in the proposed renewed permit for total mercury.

5/20/2023

6/4/2023

Anti-Backsliding

N/A

Threatened and Endangered Mussel Species Concerns and Considerations

This segment of Oil Creek is known to also contain federal and state listed threatened and endangered mussel species. Due to the Outfall 001 discharging directly to Oil Creek, potential impacts to endangered mussel species were evaluated.

The USFWS has indicated in comment letters and email correspondence on other NPDES permits, that to protect threatened and endangered mussel species, wastewater discharges containing ammonia-nitrogen (NH3-N), chloride (Cl-) dissolved nickel, dissolved zinc, and total copper where mussels or their habitat exist, can be no more than 1.9 mg/l, 78 mg/l, 7.3 µg/l, 13.18 µg/l, and 10 µg/l respectively. Therefore, the Department has considered all of these parameters in this evaluation.

The calculated site-specific criteria based on WQN Station 868 stream background pH data and default temperature for a WWF (pH of 7.55 and temperature of 25) results in NH3-N criteria of 0.965 mg/l.

The Department conducted a mussel survey on Oil Creek on June 11, 12 & 14, 2018, including in the vicinity and adjacent to this discharge. The findings of that survey were that no live mussels were collected within 200 meters below the discharge. One northern riffleshell was found on the right descending bank between 200 and 250 meters downstream of the discharge during the survey.

A summary of the sampling data for ammonia-nitrogen (NH3-N) and chloride (Cl-) are based on three samples at Outfall 001 for the 2020 renewal application, and one sample of total copper, dissolved nickel and dissolved zinc based from water chemistry data of this discharge provided in a Department Memo "Results of Water Chemistry Collections at National Pollution Discharge Elimination System (NPDES) Discharges – Freshwater Mussel Toxicity Study Allegheny River, Shenango River and French Creek Watersheds," dated March 6, 2023 as follows:

PARAMETER	UNITS	Outfall 001			Comments
		Max	Avg. Value	No. Samples	
NH_3-N	mg/l	4.85	0.639	17	Renewal Application
NH3-N (additional)	mg/l	9.73	0.508		eDMR average monthly data from August 2020 to March 2023.
Chloride	mg/l	108	101.5	3	Renewal Application
Dissolved Nickel	µg/l	<8.0		1	
Dissolved Zinc	µg/l	26.1		1	
Total Copper	µg/l	4.51		1	

As can be seen from the sampling above, the total copper effluent concentration is below protective levels for threatened and endangered mussels.

The attached Mussel Impact Evaluation Sheet was used to determine the area of river that will be required to assimilate the maximum reported effluent concentrations of ammonia nitrogen, chloride, nickel, zinc, and copper to achieve pollutant concentrations that at or below the USFWS criteria in the river. The spreadsheet determined all parameters besides ammonia nitrogen had a calculated area of impact of less than one square meters. Using the maximum discharge concentration reported on the renewal application, the spreadsheet calculated an area of impact of up to 6.11 square meters due to ammonia nitrogen in low flow scenario.

Based on the fact that the closest known mussels downstream are over 200 meters downstream, there are no perceived impacts to threatened and endangered mussels due to this discharge. Additionally, please note that although the maximum concentration reported for ammonia nitrogen has a significant calculated area of impact, it should be noted that the long-term average concentration being discharged is below the site-specific criterion of 0.965 mg/l for protection of mussels.

Ammonia nitrogen will continue to be monitored in the renewed NPDES Permit. No additional requirements are recommended at this time due to threatened and endangered mussels in Oil Creek.

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	Weekly Average	Minimum	Average Monthly	Weekly Average	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
DO	XXX	XXX	4.0 Daily Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
CBOD5	50	80	XXX	25	40	50	1/week	24-Hr Composite
BOD5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	24-Hr Composite
TSS	60	90	XXX	30	45	60	1/week	24-Hr Composite
TSS Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	1/week	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/week	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/quarter	Grab
Total Nitrogen	Report Avg Qrtly	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	24-Hr Composite
Ammonia	Report	XXX	XXX	Report	XXX	XXX	2/month	24-Hr Composite

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	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Total Phosphorus	Report Avg Qrtly	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	24-Hr Composite

Compliance Sampling Location: Outfall 001 (after disinfection)

Other Comments:

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
16E	54128	OIL CREEK	**2.620**	1022.00	314.00	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	31.50	0.00	0.000	0.000	0.0	0.00	0.00	25.00	7.55	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
Rouseville Boro	PA0024392	0.2400	0.0000	0.0000	0.000	20.00	6.80

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	1.10	0.00	1.50
Dissolved Oxygen	4.00	7.54	0.00	0.00
NH3-N	25.00	0.03	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
16E	54128	OIL CREEK	**1.180**	990.00	316.00	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	7.55	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
16E	54128	OIL 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												
2.620	31.50	0.00	31.50	.3713	0.00421	.927	84.65	91.34	0.41	0.217	24.94	7.53
Q1-10 Flow												
2.620	20.16	0.00	20.16	.3713	0.00421	NA	NA	NA	0.32	0.277	24.91	7.52
Q30-10 Flow												
2.620	42.84	0.00	42.84	.3713	0.00421	NA	NA	NA	0.48	0.183	24.96	7.53

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
16E	54128	OIL 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
2.620	Rouseville Boro	6.01	50	6.01	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
2.620	Rouseville Boro	.98	25	.98	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)		
2.62	Rouseville Boro	25	25	25	25	4	4	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
16E	54128	OIL CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
2.620	0.240	24.942	7.527
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
84.651	0.927	91.337	0.406
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
1.38	0.270	0.32	1.024
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.499	8.967	Tsivoglou	5
Reach Travel Time (days)			
0.217			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.022	1.37	0.31	7.54
0.043	1.36	0.31	7.54
0.065	1.35	0.30	7.54
0.087	1.34	0.29	7.54
0.108	1.33	0.29	7.54
0.130	1.32	0.28	7.54
0.152	1.31	0.27	7.54
0.173	1.30	0.27	7.54
0.195	1.29	0.26	7.54
0.217	1.28	0.26	7.54

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
16E	54128	OIL 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)
2.620	Rouseville Boro	PA0024392	0.240	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			4

1A	B	C	D	E	F	G
2	**TRC EVALUATION**					
3	Input appropriate values in B4:B8 and E4:E7					
4	31.5	= Q stream (cfs)		0.5	= CV Daily	
5	0.24	= Q discharge (MGD)		0.5	= CV Hourly	
6	30	= no. samples		0.24	= 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)		0	=Decay Coefficient (K)	
10	Source	Reference	AFC Calculations		Reference	CFC Calculations
11	TRC	1.3.2.iii	WLA afc =	6.514	1.3.2.iii	WLA cfc = 26.397
12	PENTOXSD TRG	5.1a	LTAMULT afc =	0.373	5.1c	LTAMULT cfc = 0.581
13	PENTOXSD TRG	5.1b	LTA_afc=	2.427	5.1d	LTA_cfc = 15.346
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)**

Rouseville Borough STP
Cornplanter Township, Venango County
PA0024392 Discharge pH

Outfall 001

Date	pH min	pH max	10^ -pH min	10^ -pH max	& pH max)	-Log (Ave pH)
Jul-20	6.9	7.2	1.26E-07	6.31E-08	9.45E-08	**7.0**
Aug-20	6.8	7.2	1.58E-07	6.31E-08	1.11E-07	**7.0**
Sep-20	6.7	7.1	2E-07	7.94E-08	1.39E-07	**6.9**
Jul-21	6.6	6.9	2.51E-07	1.26E-07	1.89E-07	**6.7**
Aug-21	6.6	6.9	2.51E-07	1.26E-07	1.89E-07	**6.7**
Sep-21	6.5	7.0	3.16E-07	1E-07	2.08E-07	**6.7**
Jul-22	6.6	7.2	2.51E-07	6.31E-08	1.57E-07	**6.8**
Aug-22	6.7	7.2	2E-07	6.31E-08	1.31E-07	**6.9**
Sep-22	6.6	7.1	2.51E-07	7.94E-08	1.65E-07	**6.8**
					Median:	**6.8**

5/9/2023

Outfall 001

Facility:	Rouseville Boro STP
Permit Number:	PA0024392 Effective: Expiration:
Outfall No:	001
Location:	Cornplanter Township, Venango County
Discharge to:	Oil Creek
Site Specific Mussel Survey Completed:	No

Discharge and Stream Characteristics			Comments
Q_S	Stream Flow	20 MGD / 31.5 cfs	
Q_D	Discharge Flow	0.24 MGD / 0.37139 cfs	
$C_{S(Cl^-)}$	Instream chloride Concentration	16.77 mg/L	9/12/2017 sample at WQN #868
$C_{E(Cl^-)}$	Discharge chloride (existing)	108 mg/L	Maximum value from 2020 NPDES Renewal Application
$C_{P(Cl^-)}$	Discharge chloride (proposed)	108 mg/L	Maximum value from 2020 NPDES Renewal Application
$C_{S(Ni)}$	Instream nickel Concentration	2 µg/L	Average of three instream samples taken on 8/8, 8/19, and 8/29/2022 (< 0.002, < 0.002, and 0.002 mg/L) in Plum Boro, Allegheny County.
$C_{E(Ni)}$	Discharge nickel (existing)	8 µg/L	Fall 2022 discharge sample collected by the Department
$C_{P(Ni)}$	Discharge nickel (proposed)	8 µg/L	Fall 2022 discharge sample collected by the Department
$C_{S(Zn)}$	Instream zinc Concentration	5 µg/L	9/12/2017 sample on the Allegheny River above Oil City (<5 ug/l)
$C_{E(Zn)}$	Discharge zinc (existing)	26.1 µg/L	Fall 2022 discharge sample collected by the Department
$Zn_{P(Zn)}$	Discharge zinc (proposed)	26.1 µg/L	Fall 2022 discharge sample collected by the Department
$C_{S(Cu)}$	Instream copper Concentration	4 µg/L	9/12/2017 sample at WQN #868
$C_{E(Cu)}$	Discharge copper (existing)	4.51 µg/L	Fall 2022 discharge sample collected by the Department
$Zn_{P(Cu)}$	Discharge copper (proposed)	4.51 µg/L	Fall 2022 discharge sample collected by the Department
$C_{S(NH3-N)}$	Instream NH^3-N	0.026 mg/L	WQN #868
$C_{E(NH3-N)}$	Discharge NH^3-N (existing)	9.73 mg/L	Maximum value from 2020 NPDES Renewal Application
$C_{P(NH3-N)}$	Discharge NH^3-N (proposed)	9.73 mg/L	Maximum value from 2020 NPDES Renewal Application
pH_S	Instream pH	7.55 S.U.	WQN #868
T_S	Instream Temp.	25 °C	Default value for a WWF
$C_{C(NH3-N)}$	Ammonia criteria	0.965 mg/L	From ammonia criteria comparison spreadsheet -using instream pH and Temp
$C_{C(Cl^-)}$	Chloride criteria	78 mg/L	USFWS criteria
$C_{C(Ni)}$	Nickel criteria	7.3 µg/L	USFWS criteria
$C_{C(Zn)}$	Zinc criteria	13.18 µg/L	USFWS criteria
$C_{C(Cu)}$	Copper criteria	10 µg/L	USFWS criteria
W_S	Stream width	30.5 meters	Google Earth (Approximate)

Ammonia Criteria Calculations:

	pH_S	7.55	S.U.	*(Default value is 7.0)*
	T_S	25	°C	*(Default value is 20° for a CWF and 25° for a WWF)*

Acute Criteria

	METHOD and UNITS	CRITERIA	Comments	
	Old CMC (mg TAN/L) =	3.839		
	EPA 2013 CMC (mg TAN/L) =	5.654	Oncorhynchus present	* formula on pg. 41 (plateaus at 15.7 C)
		5.654	Oncorhynchus absent	* formula on pg. 42 (plateaus at 10.2 C)

Chronic Criteria

	METHOD and UNITS	CRITERIA	COMMENTS
	Old CMC (mg TAN/L) =	0.978	
$C_{C(NH3-N)}$	EPA 2013 CMC (mg TAN/L) =	0.965	* formula on pg. 46 (plateaus at 7 C)

Endangered Mussel Species Impact Area Calculations:

Existing Area of Impact

☑ N/A - No Site Specific Mussel Survey Completed for this Discharger

Approximate Area of Impact Determined from Survey =	N/A m^2	(Enter N/A if no site specific survey has been completed)
Existing Mussel Density within Area of Impact =		
Rabbitsfoot *(Quadrula cylindrical)*	per m^2	
Northern Riffleshell *(Epioblasma torulosa rangiana)*	per m^2	
Rayed Bean *(Villosa fabalis)*	per m^2	
Clubshell *(Pleurobema clava)*	per m^2	
Sheepnose *(Plethobasus cyphyus)*	per m^2	
Snuffbox *(Epioblasma triquetra)*	per m^2	
TOTAL	0 per m^2	

Method 1 - Utilizing Site Specific Mussel Survey Information

☑ N/A - No Site Specific Mussel Survey Completed for this Discharger

This method utilizes a simple comparison of the size of the existing area of impact as determined from a site specific mussel survey and the chlorides in the existing discharge compared to the chlorides in the proposed discharge after the facility upgrades treatment technologies. This method is only applicable to where the stream impairment is caused by TDS and/or chlorides as the plume has been delineated through conductivity measurements.

A.	Area of Impact Determined from Survey:	N/A	m^2
B.	Chlorides in Existing Discharge:	108	mg/L
C.	Chlorides in Proposed Discharge after Treatment Facility Upgrades:	108	mg/L
D.	Approximate Area of Impact after Treatment Facility Upgrades:	N/A	m^2

A/B = D/C Therefore, D = (A*C)/B

5/9/2023

Outfall 001

Facility:	Rouseville Boro STP		
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Outfall No:	001		
Location:	Cornplanter Township, Venango County		
Discharge to:	Oil Creek		
Site Specific Mussel Survey Completed:	No		

Endangered Mussel Species Impact Area Calculations: (continued...)

Method 2 - Mass Balance Relationship of Loading and Assimilative Capacity of Stream

Chloride (Cl^-)	$L_{S(Cl^-)}$ = Available Chloride Loading in Stream = $C_{C(Cl^-)} - C_{S(Cl^-)} \times Q_S$(MGD) X 8.34 =	10,213 lbs/Day
	$L_{D\text{-}MAX(Cl^-)}$ = Current Maximum Discharge Chloride Loading exceeding criteria = {$C_{E(CL^-)} - C_{E(CL^-)}$} X Q_D(MGD) X 8.34 =	60 lbs/Day
	$\%_{E(Cl^-)}$ = Percent of Stream Capacity for Current Loading = $L_{D\text{-}MAX(Cl^-)} / L_{S(Cl^-)}$ =	1% of Stream Capacity
	$L_{D(CF)}$ = Proposed Discharge Cl^- Loading exceeding criteria after Treatment Facility Upgrades = {$C_{P(CF)} - C_{P(CF)}$} X Q_D(MGD) X 8.34 =	60.048 lbs/Day
	$\%_{P(Cl^-)}$ = Percent of Stream Capacity for Proposed Loading = $L_{D(Cl^-)} / L_{S(Cl^-)}$ =	0.59% of Stream Capacity
	Proposed Area of Impact due to Chloride * = $(\%_{P(Cl^-)} \times W_S)^2 \times 0.5$ = * assuming equal flow across transect and 90° spread at discharge	0.02 m^2
Nickel(Ni)	$L_{S(Ni)}$ = Available Nickel Loading in Stream = $C_{C(Ni)} - C_{S(Ni)} \times Q_S$(MGD) X 8.34 =	884 lbs/Day
	$L_{D\text{-}MAX(Ni)}$ = Current Maximum Discharge Nickel Loading exceeding criteria = {$C_{E(Ni)} - C_{E(Ni)}$} X Q_D(MGD) X 8.34 =	1 lbs/Day
	$\%_{E(Ni)}$ = Percent of Stream Capacity for Current Loading = $L_{D\text{-}MAX(Ni)} / L_{S(Ni)}$ =	0% of Stream Capacity
	$L_{D(Ni)}$ = Proposed Discharge Ni Loading exceeding criteria after Treatment Facility Upgrades = {$C_{P(Ni)} - C_{P(Ni)}$} X Q_D(MGD) X 8.34 =	1.40112 lbs/Day
	$\%_{P(Ni)}$ = Percent of Stream Capacity for Proposed Loading = $L_{D(Ni)} / L_{S(Ni)}$ =	0.16% of Stream Capacity
	Proposed Area of Impact due to Nickel * = $(\%_{P(Ni)} \times W_S)^2 \times 0.5$ = * assuming equal flow across transect and 90° spread at discharge	0.00 m^2
Zinc (Zn)	$L_{S(Zn)}$ = Available Zinc Loading in Stream = $C_{C(Zn)} - C_{S(Zn)} \times Q_S$(MGD) X 8.34 =	1,364 lbs/Day
	$L_{D\text{-}MAX(Zn)}$ = Current Maximum Discharge Zinc Loading exceeding criteria = {$C_{E(Zn)} - C_{E(Zn)}$} X Q_D(MGD) X 8.34 =	26 lbs/Day
	$\%_{E(Zn)}$ = Percent of Stream Capacity for Current Loading = $L_{D\text{-}MAX(Zn)} / L_{S(Zn)}$ =	2% of Stream Capacity
	$L_{D(Zn)}$ = Proposed Discharge Zn Loading exceeding criteria after Treatment Facility Upgrades = {$C_{P(Zn)} - C_{P(Zn)}$} X Q_D(MGD) X 8.34 =	25.860672 lbs/Day
	$\%_{P(Zn)}$ = Percent of Stream Capacity for Proposed Loading = $L_{D(Zn)} / L_{S(Zn)}$ =	1.90% of Stream Capacity
	Proposed Area of Impact due to Zinc * = $(\%_{P(Zn)} \times W_S)^2 \times 0.5$ = * assuming equal flow across transect and 90° spread at discharge	0.17 m^2
Copper (Cu)	$L_{S(Cu)}$ = Available Copper Loading in Stream = $C_{C(Cu)} - C_{S(Cu)} \times Q_S$(MGD) X 8.34 =	1,001 lbs/Day
	$L_{D\text{-}MAX(Cu)}$ = Current Maximum Discharge Copper Loading exceeding criteria = {$C_{E(Cu)} - C_{E(Cu)}$} X Q_D(MGD) X 8.34 =	-11 lbs/Day
	$\%_{E(Cu)}$ = Percent of Stream Capacity for Current Loading = $L_{D\text{-}MAX(Cu)} / L_{S(Cu)}$ =	0% of Stream Capacity
	$L_{D(Cu)}$ = Proposed Discharge Cu Loading exceeding criteria after Treatment Facility Upgrades = {$C_{P(Cu)} - C_{P(Cu)}$} X Q_D(MGD) X 8.34 =	-10.988784 lbs/Day
	$\%_{P(Cu)}$ = Percent of Stream Capacity for Proposed Loading = $L_{D(Cu)} / L_{S(Cu)}$ =	-1.10% of Stream Capacity
	Proposed Area of Impact due to Copper* = $(\%_{P(Cu)} \times W_S)^2 \times 0.5$ = * assuming equal flow across transect and 90° spread at discharge	0.06 m^2
Ammonia-Nitrogen (NH3-N)	$L_{S(NH3\text{-}N)}$ = Available NH3-N Loading in Stream = $C_{C(NH3\text{-}N)} - C_{S(NH3\text{-}N)} \times Q_S$(MGD) X 8.34 =	157 lbs/Day
	$L_{D\text{-}MAX(NH3\text{-}N)}$ = Current Maximum Discharge NH3-N Loading = $C_{E(NH3\text{-}N)} \times Q_D$(MGD) X 8.34 =	19 lbs/Day
	$\%_{E(NH3\text{-}N)}$ = Percent of Stream Capacity for Current Loading = $L_{D\text{-}MAX(NH3\text{-}N)} / L_{S(NH3\text{-}N)}$ =	12% of Stream Capacity
	$L_{D(NH3\text{-}N)}$ = Proposed Discharge NH3-N Loading after Treatment Facility Upgrades = $C_{P(NH3\text{-}N)} - C_{C(NH3\text{-}N)} \times Q_D$(MGD) X 8.34 =	18 lbs/Day
	$\%_{P(NH3\text{-}N)}$ = Percent of Stream Capacity for Proposed Loading = $L_{D(NH3\text{-}N)} / L_{S(NH3\text{-}N)}$ =	11.46% of Stream Capacity
	Proposed Area of Impact due to NH3-N * = $(\%_{P(NH3\text{-}N)} \times W_S)^2 \times 0.5$ = * assuming equal flow across transect and 90° spread at discharge	6.11 m^2

5/9/2023

Outfall 001

Facility:	Rouseville Boro STP		
Permit Number:	PA0024392	Effective:	Expiration:
Outfall No:	001		
Location:	Cornplanter Township, Venango County		
Discharge to:	Oil Creek		
Site Specific Mussel Survey Completed:	No		

Endangered Mussel Species Impact Area Calculations: (continued...)

Method 3 - Mass Balance Relationship of Stream Flow, Proposed Effluent Quality, and Mussel Protection Criteria

Chloride (Cl⁻)	$Q_{A(Cl^-)}C_{S(Cl^-)} + Q_D C_{P(Cl^-)} = Q_T C_{C(Cl^-)}$	
	$Q_{A(Cl^-)}$ = Assimilative Stream Flow Required to Achieve Criteria (cfs)	
	$Q_T = Q_S + Q_D$ (cfs)	
	$Q_{A(Cl^-)}C_{S(Cl^-)} + Q_D C_{P(Cl^-)} = (Q_D+Q_S)C_{C(Cl^-)}$	
	SOLVING FOR $Q_{A(Cl^-)} = [(Q_D C_{P(Cl^-)} / C_{C(Cl^-)}) - Q_D)] / (1 - C_{S(Cl^-)}/C_{C(Cl^-)})$ =	0.18196472 cfs
	$\%_{P(Cl^-)}$ = Percent of Stream Width Required to Assimilate Chlorides to Criteria Concentration = $Q_{A(Cl^-)} / Q_S$ (cfs) =	0.5777%
	$W_{I(Cl^-)}$ = Proposed Width of Stream required to Assimilate Chlorides to Criteria Concentration = W_S X $\%_{P(Cl^-)}$	0.176188 meters
	Proposed Area of Impact due to Chloride * = $(W_{I(Cl^-)})^2$ X 0.5 = * assuming equal flow across transect and 90° spread at discharge	0.02 m^2
Nickel (Ni)	$Q_{A(Ni)}C_{S(Ni)} + Q_D C_{P(Ni)} = Q_T C_{C(Ni)}$	
	$Q_{A(Ni)}$ = Assimilative Stream Flow Required to Achieve Criteria (cfs)	
	$Q_T = Q_S + Q_D$ (cfs)	
	$Q_{A(Ni)}C_{S(Ni)} + Q_D C_{P(Ni)} = (Q_D+Q_S)C_{C(Ni)}$	
	SOLVING FOR $Q_{A(Ni)} = [(Q_D C_{P(Ni)} / C_{C(Ni)}) - Q_D)] / (1 - C_{S(Ni)}/C_{C(Ni)})$ =	0.04905151 cfs
	$\%_{P(Cl^-)}$ = Percent of Stream Width Required to Assimilate Nickel to Criteria Concentration = $Q_{A(Ni)} / Q_S$ (cfs) =	0.1557%
	$W_{I(Ni)}$ = Proposed Width of Stream required to Assimilate Nickel to Criteria Concentration = W_S X $\%_{P(Ni)}$	0.047494 meters
	Proposed Area of Impact due to Nickel * = $(W_{I(Ni)})^2$ X 0.5 = * assuming equal flow across transect and 90° spread at discharge	0.00 m^2
Zinc (Zn)	$Q_{A(Zn)}C_{S(Zn)} + Q_D C_{P(Zn)} = Q_T C_{C(Zn)}$	
	$Q_{A(Zn)}$ = Assimilative Stream Flow Required to Achieve Criteria (cfs)	
	$Q_T = Q_S + Q_D$ (cfs)	
	$Q_{A(Zn)}C_{S(Zn)} + Q_D C_{P(Zn)} = (Q_D+Q_S)C_{C(Zn)}$	
	SOLVING FOR $Q_{A(Zn)} = [(Q_D C_{PZn)} / C_{C(Zn)}) - Q_D)] / (1 - C_{S(Zn)}/C_{C(Zn)})$ =	0.58659643 cfs
	$\%_{P(Cl^-)}$ = Percent of Stream Width Required to Assimilate Zinc to Criteria Concentration = $Q_{A(Zn)} / Q_S$ (cfs) =	1.8622%
	$W_{I(Zn)}$ = Proposed Width of Stream required to Assimilate Zinc to Criteria Concentration = W_S X $\%_{PZn)}$	0.567974 meters
	Proposed Area of Impact due to Zinc * = $(W_{IZn)})^2$ X 0.5 = * assuming equal flow across transect and 90° spread at discharge	0.16 m^2
Copper (Cu)	$Q_{A(Cu)}C_{S(Cu)} + Q_D C_{P(Cu)} = Q_T C_{C(Cu)}$	
	$Q_{A(Cu)}$ = Assimilative Stream Flow Required to Achieve Criteria (cfs)	
	$Q_T = Q_S + Q_D$ (cfs)	
	$Q_{A(Cu)}C_{S(Cu)} + Q_D C_{P(Cu)} = (Q_D+Q_S)C_{C(Cu)}$	
	SOLVING FOR $Q_{A(Cu)} = [(Q_D C_{PCu)} / C_{C(Cu)}) - Q_D)] / (1 - C_{S(Cu)}/C_{C(Cu)})$ =	-0.33982185 cfs
	$\%_{P(Cu)}$ = Percent of Stream Width Required to Assimilate Copper to Criteria Concentration = $Q_{A(Cu)} / Q_S$ (cfs) =	-1.0788%
	$W_{I(Cu)}$ = Proposed Width of Stream required to Assimilate Copper to Criteria Concentration = W_S X $\%_{PCu)}$	-0.329034 meters
	Proposed Area of Impact due to Copper * = $(W_{I(Cu)})^2$ X 0.5 = * assuming equal flow across transect and 90° spread at discharge	0.05 m^2
Ammonia-Nitrogen (NH3-N)	$Q_{A(NH3\text{-}N)}C_{S(NH3\text{-}N)} + Q_D C_{P(NH3\text{-}N)} = Q_T C_{C(NH3\text{-}N)}$	
	$Q_{A(NH3\text{-}N)}$ = Assimilative Stream Flow Required to Achieve Criteria (cfs)	
	$Q_T = Q_S + Q_D$ (cfs)	
	$Q_{A(NH3\text{-}N)}C_{S(NH3\text{-}N)} + Q_D C_{P(NH3\text{-}N)} = (Q_D+Q_S)C_{C(NH3\text{-}N)}$	
	SOLVING FOR $Q_{A(NH3\text{-}N)} = [(Q_D C_{P(NH3\text{-}N)} / C_{C(NH3\text{-}N)}) - Q_D)] / (1 - C_{S(NH3\text{-}N)}/C_{C(NH3\text{-}N)})$ =	3.466702 cfs
	$\%_{P(NH3\text{-}N)}$ = Percent of Stream Width Required to Assimilate NH3-N to Criteria Concentration = $Q_{A(NH3\text{-}N)} / Q_S$ (cfs) =	11.0054%
	$W_{I(NH3\text{-}N)}$ = Proposed Width of Stream required to Assimilate NH3-N to Criteria Concentration = W_S X $\%_{P(NH3\text{-}N)}$	3.356648 meters
	Proposed Area of Impact due to NH3-N * = $(W_{I(NH3\text{-}N)})^2$ X 0.5 = * assuming equal flow across transect and 90° spread at discharge	5.63 m^2