

Application Type Renewal
 Facility Type Sewage
 Major / Minor Major

**NPDES PERMIT FACT SHEET
ADDENDUM**

Application No. PA0100277
 APS ID 1017790
 Authorization ID 1316945

Applicant and Facility Information

Applicant Name	<u>North & South Shenango Township Joint Municipal Authority</u>	Facility Name	<u>North & South Shenango Joint STP</u>
Applicant Address	<u>3334 Water Trail Drive Jamestown, PA 16134-4412</u>	Facility Address	<u>3334 Water Trail Drive Jamestown, PA 16134-4412</u>
Applicant Contact	<u>Michael Richter</u>	Facility Contact	<u>Ryan Wise</u>
Applicant Phone	<u>(724) 932-3138</u>	Facility Phone	<u></u>
Client ID	<u>44974</u>	Site ID	<u>240657</u>
SIC Code	<u>4952</u>	Municipality	<u>South Shenango Township</u>
SIC Description	<u>Trans. & Utilities - Sewerage Systems</u>	County	<u>Crawford</u>
Date Published in PA Bulletin	<u></u>	EPA Waived?	<u>No</u>
Comment Period End Date	<u></u>	If No, Reason	<u>Major Facility</u>
Purpose of Application	<u>Application for a renewal of an NPDES permit for discharge of treated Sewage</u>		

Internal Review and Recommendations

This NPDES permit renewal was initially drafted in February of 2022. Several years have elapsed since the draft period, so the permit is being re-drafted. The Department received several comments on the initial draft permit, all via email, and each comment will be summarized below with the emails attached at the end of this document.

The Environmental Protection Agency commented on March 13, 2022. EPA noted that the draft permit did not propose an effluent limit for Total Zinc, but rather monitoring requirements and a Toxics Reduction Evaluation (TRE) to determine whether an effluent limit would be necessary. EPA also noted the draft permit was to be forwarded to the U.S. Fish & Wildlife Service, and requested we forward any of USFWS' comments to EPA for their own review and records.

The Department's Response: The permittee submitted supplemental sampling after the initial draft permit, and this data was incorporated into our Toxics Management Spreadsheet (TMS). TMS modeling did not recommend monitoring for Total Zinc, but The Department shall retain monitoring for Total Zinc due to concerns for its effect on Threatened & Endangered species of freshwater mussels present in the receiving stream. EPA's comments are contained in this document, which is being forwarded to USFWS upon re-draft.

The U.S. Fish & Wildlife Service (USFWS) requested a joint meeting with The Department and the PA Fish & Boat Commission (PFBC) in March of 2022, then submitted a comment (which also serves as a meeting summary). USFWS supported the Department's decision to approve the permit provided the permit could be modified based on new data collected, and a joint study plan was to be implemented by PFCB, DEP, and USFWS.

The Department's Response: This study plan was to involve water quality data, a mussel survey, and mussel toxicity data. The water quality data collection and mussel survey were performed by the Department. No mussel toxicity data was received. The initial draft permit proposed an effluent limit for Total Copper, then monitoring for

Approve	Return	Deny	Signatures	Date
X			Jordan A. Frey, E.I.T. Jordan A. Frey, E.I.T. / Project Manager	March 31, 2026
X			Adam Olesnanik Adam Olesnanik, P.E. / Environmental Engineer Manager	March 31, 2026

Internal Review and Recommendations

Total Nickel, Total Zinc, and Chloride to be protective of T&E species of freshwater mussels. TMS modeling of the supplemental water quality data recommended monitoring-only for Total Copper, and did not recommend monitoring for the other parameters. The Department shall impose monitoring requirements for each of those parameters. The standard permit terms reserve the right for the Department to revisit effluent limits upon renewal of an NPDES permit, or to conduct a Department-initiated amendment during the term of a permit if the facility's discharge becomes a public nuisance. This should satisfy USFWS' concern.

The Pennsylvania Fish & Boat Commission also requested the joint meeting with the Department and USFWS. PAFBC's comments were identical to USFWS' comments above, and have been addressed in the above response.

The North and South Shenango Joint Municipal Authority (NSSJMA) submitted comments to the Department in March of 2022. They requested a meeting with the Department to discuss effluent limits on Total Copper, Benzo(a)Anthracene, Benzo(a)Pyrene, and Benzo(k)Fluoranthene, and a Toxics Reduction Evaluation proposed by the Department. In that meeting, the Department granted a supplemental sampling period from April through July of 2022. Samples were taken 2/Month for Copper, Aluminum, Zinc, Bis(2-ethylhexyl) Phthalate, Benzo(a)Anthracene, Benzo(a)Pyrene, and Benzo(k)Fluoranthene. 1/Quarter samples (meaning one sample each) were taken for Nickel and Chloride. These samples were submitted along with follow-up comments in an email to the Department in August of 2022. The permittee requested we consider these additional samples in justifying revising and/or removing our requirements for Copper, the three Benzo parameters, and bis(2-ethylhexyl) phthalate, stating the sampling would constitute an unnecessary financial burden.

The Department's Response: The Department entered the supplemental sampling data into TMS and agrees that monitoring for the three Benzo parameters, and Total Aluminum can justifiably be removed. However, the samples for bis(2-ethylhexyl) phthalate justify an effluent limit that shall be added to the second draft permit. Total Copper sample results justify monitoring-only based on TMS modeling on the grounds that these results would have justified relaxing limits to monitoring-only if the facility had a Total Copper effluent limit already.

Note that initial draft NPDES permit section C.V. "WQBELs BELOW QUANTITATION LIMITS" was removed from the permit because the parameters it regarded (the Benzo parameters) have been removed.

There are currently no open violations for this client (44974) as of 3/31/2026.

The modeling used in this analysis is attached to this addendum. The original fact sheet is attached after that for reference.



Discharge Information

Instructions Discharge Stream

Facility: North & South Shenango Joint STP NPDES Permit No.: PA0100277 Outfall No.: 001
 Evaluation Type: Major Sewage / Industrial Waste Wastewater Description: Domestic Sewage

Discharge Characteristics								
Design Flow (MGD)*	Hardness (mg/l)*	pH (SU)*	Partial Mix Factors (PMFs)				Complete Mix Times (min)	
			AFC	CFC	THH	CRL	Q ₇₋₁₀	Q _h
1.7	177.3	7						

Discharge Pollutant	Units	Max Discharge Conc	0 if left blank		0.5 if left blank		0 if left blank			1 if left blank	
			Trib Conc	Stream Conc	Daily CV	Hourly CV	Stream CV	Fate Coeff	FOS	Criteria Mod	Chem Transl
Group 1	Total Dissolved Solids (PWS)	mg/L									
	Chloride (PWS)	mg/L	40.8								
	Bromide	mg/L									
	Sulfate (PWS)	mg/L									
	Fluoride (PWS)	mg/L									
Group 2	Total Aluminum	µg/L	24.235								
	Total Antimony	µg/L									
	Total Arsenic	µg/L									
	Total Barium	µg/L									
	Total Beryllium	µg/L									
	Total Boron	µg/L									
	Total Cadmium	µg/L									
	Total Chromium (III)	µg/L									
	Hexavalent Chromium	µg/L									
	Total Cobalt	µg/L									
	Total Copper	µg/L	3.95								
	Free Cyanide	µg/L									
	Total Cyanide	µg/L									
	Dissolved Iron	µg/L									
	Total Iron	µg/L									
	Total Lead	µg/L									
	Total Manganese	µg/L									
	Total Mercury	µg/L									
	Total Nickel	µg/L	2.14								
	Total Phenols (Phenolics) (PWS)	µg/L									
Total Selenium	µg/L										
Total Silver	µg/L										
Total Thallium	µg/L										
Total Zinc	µg/L	12.1									
Total Molybdenum	µg/L										
Acrolein	µg/L	<									
Acrylamide	µg/L	<									
Acrylonitrile	µg/L	<									
Benzene	µg/L	<									
Bromoform	µg/L	<									



Stream / Surface Water Information

North & South Shenango Joint STP, NPDES Permit No. PA0100277, Outfall 001

- Instructions
- Discharge
- Stream

Receiving Surface Water Name: Shenango River No. Reaches to Model: 1

- Statewide Criteria
- Great Lakes Criteria
- ORSANCO Criteria

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi ²)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	035482	68.2	978	167			Yes
End of Reach 1	035482	57	934	302.6		2	Yes

Q₇₋₁₀

Location	RMI	LFY (cfs/mi ²)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	68.2	0.023	8.145									70	7.71		
End of Reach 1	57	0.151	45.7									70	7.71		

Q_n

Location	RMI	LFY (cfs/mi ²)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	68.2														
End of Reach 1	57														



Model Results

North & South Shenango Joint STP, NPDES Permit No. PA0100277, Outfall 001

Instructions

Results

RETURN TO INPUTS

SAVE AS PDF

PRINT

All

Inputs

Results

Limits

Hydrodynamics

Q₇₋₁₀

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
68.2	8.15		8.15	2.63	0.00074	0.834	58.639	70.283	0.22	3.108	129.554
57	45.70	3.094	42.606								

Q_n

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
68.2	46.46		46.46	2.63	0.00074	1.626	58.639	36.063	0.515	1.329	74.643
57	209.776	3.094	206.68								

Wasteload Allocations

AFC

CCT (min): 15

PMF: 0.340

Analysis Hardness (mg/l): 122.24

Analysis pH: 7.23

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	750	750	1,540	
Total Copper	0	0		0	16.239	16.9	34.7	Chem Translator of 0.96 applied
Total Nickel	0	0		0	554.956	556	1,142	Chem Translator of 0.998 applied
Total Zinc	0	0		0	138.919	142	292	Chem Translator of 0.978 applied
Bis(2-Ethylhexyl)Phthalate	0	0		0	4,500	4,500	9,242	

CFC

CCT (min): #####

PMF: 1

Analysis Hardness (mg/l): 96.189

Analysis pH: 7.41

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	

Total Copper	0	0	0	8.663	9.02	37.0	Chem Translator of 0.96 applied
Total Nickel	0	0	0	50.325	50.5	207	Chem Translator of 0.997 applied
Total Zinc	0	0	0	114.313	116	475	Chem Translator of 0.986 applied
Bis(2-Ethylhexyl)Phthalate	0	0	0	910	910	3,728	

THH CCT (min): ##### THH PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A PWS PMF: 1

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Chloride (PWS)	0	0	0	0	250,000	250,000	4,594,272	WQC applied at RMI 57 with a design stream flow of 45.7 cfs
Total Aluminum	0	0	0	0	N/A	N/A	N/A	
Total Copper	0	0	0	0	N/A	N/A	N/A	
Total Nickel	0	0	0	0	610	610	2,499	
Total Zinc	0	0	0	0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0	0	0	N/A	N/A	N/A	

CRL CCT (min): 74.643 PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Chloride (PWS)	0	0	0	0	N/A	N/A	N/A	
Total Aluminum	0	0	0	0	N/A	N/A	N/A	
Total Copper	0	0	0	0	N/A	N/A	N/A	
Total Nickel	0	0	0	0	N/A	N/A	N/A	
Total Zinc	0	0	0	0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0	0	0	0.32	0.32	5.97	

Recommended WQBELs & Monitoring Requirements

No. Samples/Month: 4

Pollutants	Mass Limits		Concentration Limits				Governing WQBEL	WQBEL Basis	Comments
	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units			
Total Copper	Report	Report	Report	Report	Report	µg/L	22.3	AFC	Discharge Conc > 10% WQBEL (no RP)
Bis(2-Ethylhexyl)Phthalate	0.085	0.13	0.006	0.009	0.015	mg/L	0.006	CRL	Discharge Conc ≥ 50% WQBEL (RP)

Other Pollutants without Limits or Monitoring

The following pollutants do not require effluent limits or monitoring based on water quality because reasonable potential to exceed water quality criteria was not determined and the discharge concentration was less than thresholds for monitoring, or the pollutant was not detected and a sufficiently sensitive analytical method was used (e.g., <= Target QL).

Pollutants	Governing WQBEL	Units	Comments
Chloride (PWS)	4,594	mg/L	Discharge Conc ≤ 10% WQBEL
Total Aluminum	987	µg/L	Discharge Conc ≤ 10% WQBEL

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet					
Type of Test	Chronic		Facility Name		
Species Tested	Pimephales		North & South Shenango JMA		
Endpoint	Growth		Permit No.		
TIWC (decimal)	0.24		PA0100277		
No. Per Replicate	10				
TST b value	0.75				
TST alpha value	0.25				
Test Completion Date			Test Completion Date		
2/9/2022			5/30/2023		
Replicate	Control	TIWC	Replicate	Control	TIWC
No.			No.		
1	0.236	0.282	1	0.313	0.425
2	0.312	0.324	2	0.356	0.416
3	0.262	0.319	3	0.319	0.374
4	0.284	0.189	4	0.317	0.163
5			5		
6			6		
7			7		
8			8		
9			9		
10			10		
11			11		
12			12		
13			13		
14			14		
15			15		
Mean	0.274	0.279	Mean	0.326	0.345
Std Dev.	0.032	0.063	Std Dev.	0.020	0.123
# Replicates	4	4	# Replicates	4	4
T-Test Result	2.1881		T-Test Result	1.6107	
Deg. of Freedom	4		Deg. of Freedom	3	
Critical T Value	0.7407		Critical T Value	0.7649	
Pass or Fail	PASS		Pass or Fail	PASS	
Test Completion Date			Test Completion Date		
5/21/2024			5/6/2025		
Replicate	Control	TIWC	Replicate	Control	TIWC
No.			No.		
1	0.45	0.433	1	0.358	0.392
2	0.428	0.427	2	0.377	0.367
3	0.374	0.384	3	0.402	0.364
4	0.41	0.377	4	0.289	0.384
5			5		
6			6		
7			7		
8			8		
9			9		
10			10		
11			11		
12			12		
13			13		
14			14		
15			15		
Mean	0.416	0.405	Mean	0.357	0.377
Std Dev.	0.032	0.029	Std Dev.	0.048	0.013
# Replicates	4	4	# Replicates	4	4
T-Test Result	4.9832		T-Test Result	5.6432	
Deg. of Freedom	5		Deg. of Freedom	5	
Critical T Value	0.7267		Critical T Value	0.7267	
Pass or Fail	PASS		Pass or Fail	PASS	

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet					
Type of Test	Chronic		Facility Name		
Species Tested	Pimephales		North & South Shenango JMA		
Endpoint	Survival		Permit No.		
TIWC (decimal)	0.24		PA0100277		
No. Per Replicate	10				
TST b value	0.75				
TST alpha value	0.25				
Test Completion Date			Test Completion Date		
2/8/2022			5/30/2023		
Replicate	Control	TIWC	Replicate	Control	TIWC
No.			No.		
1	0.8	1	1	0.9	1
2	1	1	2	1	1
3	1	1	3	1	0.9
4	1	0.6	4	1	0.3
5			5		
6			6		
7			7		
8			8		
9			9		
10			10		
11			11		
12			12		
13			13		
14			14		
15			15		
Mean	0.950	0.900	Mean	0.975	0.800
Std Dev.	0.100	0.200	Std Dev.	0.050	0.337
# Replicates	4	4	# Replicates	4	4
T-Test Result	3.4742		T-Test Result	1.1837	
Deg. of Freedom	4		Deg. of Freedom	3	
Critical T Value	0.7407		Critical T Value	0.7649	
Pass or Fail	PASS		Pass or Fail	PASS	
Test Completion Date			Test Completion Date		
5/21/2024			5/6/2025		
Replicate	Control	TIWC	Replicate	Control	TIWC
No.			No.		
1	1	1	1	1	1
2	1	1	2	0.9	1
3	1	0.9	3	1	0.9
4	1	1	4	0.7	1
5			5		
6			6		
7			7		
8			8		
9			9		
10			10		
11			11		
12			12		
13			13		
14			14		
15			15		
Mean	1.000	0.975	Mean	0.900	0.975
Std Dev.	0.000	0.050	Std Dev.	0.141	0.050
# Replicates	4	4	# Replicates	4	4
T-Test Result	17.8623		T-Test Result	8.5603	
Deg. of Freedom	3		Deg. of Freedom	5	
Critical T Value	0.7649		Critical T Value	0.7267	
Pass or Fail	PASS		Pass or Fail	PASS	

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet					
Type of Test	Chronic		Facility Name	North & South Shenango JMA	
Species Tested	Ceriodaphnia		Permit No.	PA0100277	
Endpoint	Reproduction				
TIWC (decimal)	0.24				
No. Per Replicate	1				
TST b value	0.75				
TST alpha value	0.2				

Test Completion Date			Test Completion Date		
Replicate	2/9/2022		Replicate	7/24/2023	
No.	Control	TIWC	No.	Control	TIWC
1	28	29	1	30	26
2	31	28	2	15	33
3	23	28	3	34	34
4	31	26	4	34	33
5	27	28	5	38	32
6	29	28	6	28	26
7	31	30	7	29	30
8	32	33	8	20	23
9	32	28	9	23	27
10	31	27	10	23	28
11			11		
12			12		
13			13		
14			14		
15			15		

Mean	29.500	28.500	Mean	27.400	29.200
Std Dev.	2.838	1.900	Std Dev.	7.121	3.736
# Replicates	10	10	# Replicates	10	10

T-Test Result	7.0649	T-Test Result	4.1968
Deg. of Freedom	17	Deg. of Freedom	17
Critical T Value	0.8633	Critical T Value	0.8633
Pass or Fail	PASS	Pass or Fail	PASS

Test Completion Date			Test Completion Date		
Replicate	5/20/2024		Replicate	5/5/2025	
No.	Control	TIWC	No.	Control	TIWC
1	26	26	1	7	30
2	25	30	2	16	27
3	20	24	3	21	26
4	30	14	4	29	32
5	31	25	5	23	32
6	21	29	6	32	31
7	28	21	7	26	25
8	22	19	8	22	30
9	24	20	9	22	28
10	24	22	10	21	20
11			11		
12			12		
13			13		
14			14		
15			15		

Mean	25.100	23.000	Mean	21.900	28.100
Std Dev.	3.695	4.830	Std Dev.	6.903	3.755
# Replicates	10	10	# Replicates	10	10

T-Test Result	2.3707	T-Test Result	5.7725
Deg. of Freedom	15	Deg. of Freedom	17
Critical T Value	0.8662	Critical T Value	0.8633
Pass or Fail	PASS	Pass or Fail	PASS

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet																																																																																																																																			
Type of Test	Chronic		Facility Name	North & South Shenango JMA																																																																																																																															
Species Tested	Ceriodaphnia		Permit No.	PA0100277																																																																																																																															
Endpoint	Survival																																																																																																																																		
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WET Summary and Evaluation

Facility Name	North & South Shenango JMA
Permit No.	PA0100277
Design Flow (MGD)	1.7
Q₇₋₁₀ Flow (cfs)	8.145
PMF_a	0.34
PMF_c	1

Species	Endpoint	Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Ceriodaphnia	Survival	2/9/22	7/24/23	5/20/24	5/5/25
		PASS	PASS	PASS	PASS

Species	Endpoint	Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Ceriodaphnia	Reproduction	2/9/22	7/24/23	5/20/24	5/5/25
		PASS	PASS	PASS	PASS

Species	Endpoint	Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Pimephales	Survival	2/8/22	5/30/23	5/21/24	5/6/25
		PASS	PASS	PASS	PASS

Species	Endpoint	Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Pimephales	Growth	2/9/22	7/24/23	5/21/24	5/6/25
		PASS	PASS	PASS	PASS

Reasonable Potential? NO

Permit Recommendations

Test Type **Chronic**
 TIWC **24** % Effluent
 Dilution Series **6, 12, 24, 62, 100** % Effluent
 Permit Limit **None**
 Permit Limit Species



Northwest Regional Office
CLEAN WATER PROGRAM

Application Type Renewal
Facility Type Municipal
Major / Minor Major

**NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE**

Application No. PA0100277
APS ID 1017790
Authorization ID 1316945

Applicant and Facility Information			
Applicant Name	<u>North & South Shenango Township Joint Municipal Authority</u>	Facility Name	<u>North & South Shenango Joint STP</u>
Applicant Address	<u>3104 Water Trail Drive Jamestown, PA 16134-4410</u>	Facility Address	<u>3104 Water Trail Drive Jamestown, PA 16134</u>
Applicant Contact	<u>Michael J. Klink</u>	Facility Contact	<u>Michael Seman</u>
Applicant Phone	<u>(724) 932-3138</u>	Facility Phone	<u>(724) 932-3138</u>
Client ID	<u>44974</u>	Site ID	<u>240657</u>
Ch 94 Load Status	<u>Not Overloaded</u>	Municipality	<u>South Shenango Township</u>
Connection Status	<u>No Limitations</u>	County	<u>Crawford</u>
Date Application Received	<u>May 29, 2020</u>	EPA Waived?	<u>No</u>
Date Application Accepted	<u>June 25, 2020</u>	If No, Reason	<u>Major Facility</u>
Purpose of Application	<u>Renewal of an NPDES Permit for an existing discharge of treated sewage from a POTW.</u>		

Summary of Review
<p>This is a municipally owned sewage treatment plant serving North and South Shenango Townships, Crawford County. The facility also accepts hauled in municipal waste (septic and holding tanks). There are no listed industrial users listed on the application.</p> <p>The plant discharges to a segment of the Shenango River, which is known to contain threatened and endangered mussel species. A summary of threatened and endangered mussel species concerns and considerations is included on Pages 13 and 14 of this Fact Sheet. Additionally, the draft permit will be forwarded to the US Fish & Wildlife Service and PA Fish and Boat Commission.</p> <p>There are currently no open violations listed in EFACTS for this permittee (2/08/2022).</p> <p>Sludge use and disposal description and location(s): Dewatered sludge is hauled offsite to Seneca Landfill (Butler County) for disposal.</p> <p><u>Public Participation</u></p> <p>DEP will publish notice of the receipt of the NPDES permit application and a tentative decision to issue the individual NPDES permit in the <i>Pennsylvania Bulletin</i> in accordance with 25 Pa. Code § 92a.82. Upon publication in the <i>Pennsylvania Bulletin</i>, 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 <i>Pennsylvania Bulletin</i> at least 30 days prior to the hearing and in at least one newspaper of general circulation within the geographical area of the discharge.</p>

Approve	Deny	Signatures	Date
X		Adam J. Pesek Adam J. Pesek, E.I.T. / Environmental Engineer	February 8, 2022
X		Justin C. Dickey Justin C. Dickey, P.E. / Environmental Engineer Manager	February 10, 2022

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	<u>001</u>	Design Flow (MGD)	<u>1.7</u>
Latitude	<u>41° 29' 51"</u>	Longitude	<u>-80° 27' 27"</u>
Quad Name	<u>Greenville West</u>	Quad Code	<u>0702</u>
Wastewater Description: <u>Treated domestic sewage</u>			
Receiving Waters	<u>Shenango River</u>	Stream Code	<u>35482</u>
NHD Com ID	<u>130027721</u>	RMI	<u>68.2</u>
Drainage Area	<u>167</u>	Yield (cfs/mi ²)	<u>.023 (accrued downstream) USGS #03101500 (50 year with seasonal split), USGS #03100000 (accrued)</u>
Q7-10 Flow (cfs)	<u>11.21 (Summer), 8.145 (Winter)</u>	Q7-10 Basis	<u>#03100000 (accrued)</u>
Elevation (ft)	<u>978</u>	Slope (ft/ft)	<u>0.00102</u>
Watershed No.	<u>20-A</u>	Chapter 93 Class.	<u>WWF</u>
Existing Use	<u></u>	Existing Use Qualifier	<u></u>
Exceptions to Use	<u></u>	Exceptions to Criteria	<u></u>
Assessment Status	<u>Attaining Use(s)</u>		
Cause(s) of Impairment	<u></u>		
Source(s) of Impairment	<u></u>		
TMDL Status	<u></u>	Name	<u></u>
Background/Ambient Data		Data Source	
pH (SU)	<u>7.71</u>		<u>WQN 911 field samples (2005-2020)(June-September)</u>
	<u>20.24 (Sum), 4.71 (Win)</u>		<u>WQN 911 (2005-2020)</u>
Temperature (°F)			<u>WQN 911 (2005-2020)(90th %)</u>
Hardness (mg/L)	<u>70</u>		<u>WQN 911 field samples (2002-2011)</u>
NH ₃ -N	<u>0.11</u>		<u>2005 sampling for NIDR – Shenango River Watershed</u>
CBOD ₅	<u>2.2</u>		
Nearest Downstream Public Water Supply Intake	<u>Greenville Municipal Authority</u>		
PWS Waters	<u>Shenango River</u>	Flow at Intake (cfs)	<u>45.7</u>
PWS RMI	<u>57</u>	Distance from Outfall (mi)	<u>11.2</u>

Changes Since Last Permit Issuance:

Other Comments:

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	<u>002</u>	Design Flow (MGD)	<u>0</u>
Latitude	<u>41° 29' 59"</u>	Longitude	<u>-80° 27' 9"</u>
Quad Name	<u>Greenville West</u>	Quad Code	<u>0702</u>
Wastewater Description: <u>Stormwater</u>			
Receiving Waters	<u>Unnamed Tributary to the Shenango River</u>	Stream Code	<u>35482</u>
NHD Com ID	<u>130027721</u>	RMI	<u>---</u>
Drainage Area	<u></u>	Yield (cfs/mi ²)	<u></u>
Q ₇₋₁₀ Flow (cfs)	<u>0</u>	Q ₇₋₁₀ Basis	<u>Dry Swale</u>
Elevation (ft)	<u></u>	Slope (ft/ft)	<u></u>
Watershed No.	<u>20-A</u>	Chapter 93 Class.	<u>WWF</u>
Existing Use	<u></u>	Existing Use Qualifier	<u></u>
Exceptions to Use	<u></u>	Exceptions to Criteria	<u></u>
Assessment Status	<u>Attaining Use(s)</u>		
Cause(s) of Impairment	<u></u>		
Source(s) of Impairment	<u></u>		
TMDL Status	<u></u>	Name	<u></u>
Background/Ambient Data		Data Source	
pH (SU)	<u></u>	<u></u>	
Temperature (°F)	<u></u>	<u></u>	
Hardness (mg/L)	<u></u>	<u></u>	
Other:	<u></u>	<u></u>	
Nearest Downstream Public Water Supply Intake	<u>Greenville Municipal Authority</u>		
PWS Waters	<u>Shenango River</u>	Flow at Intake (cfs)	<u>45.7</u>
PWS RMI	<u>57</u>	Distance from Outfall (mi)	<u></u>

Changes Since Last Permit Issuance:

Other Comments:

Treatment Facility Summary				
Treatment Facility Name: North & South Shenango Joint STP				
WQM Permit No.		Issuance Date		
2092403 A-3		4/2/2019		
Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary	Extended Aeration/ Sequencing Batch Reactor	Liquid Chlorine	1.7
Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
1.7	1758	Not Overloaded	Aerobic Digestion	Landfill

Changes Since Last Permit Issuance: Sodium bisulfite dechlorination feed equipment was added.

Other Comments:

Compliance History	
Summary of DMRs:	There were 18 effluent violations reported since January 2016. The vast majority of those were due to fecal coliform IMAX excursions (11), and TRC average monthly excursions (4). There was also a D.O. violation and two total phosphorus effluent violations.
Summary of Inspections:	<p>An unscheduled inspection occurred on 9/23/2021 to review recent I&I work and measures the Authority has done recently to reduce I&I and SSOs. Facility is already reporting a downward trend in I&I entering the plant. Brief inspection of the plant was done and was reported to be in good condition and records readily available.</p> <p>An inspection of sewer lines on Seminole Trail occurred on 7/08/2021 in response to an alleged complaint. No issues or violations were observed.</p> <p>Facility inspection was conducted on 12/09/2020. Inspection report noted a violation for SSOs and non-compliance for numerous things ranging from failure to properly calibrate testing equipment, failure to submit or properly complete monitoring reports, failure to document monitoring activities, results, and time of sample calibrations.</p>

Other Comments:

NPDES Permit Fact Sheet
North & South Shenango Joint STP

NPDES Permit No. PA0100277

Compliance History

DMR Data for Outfall 001 (from August 1, 2020 to July 31, 2021)

Parameter	JUL-21	JUN-21	MAY-21	APR-21	MAR-21	FEB-21	JAN-21	DEC-20	NOV-20	OCT-20	SEP-20	AUG-20
Flow (MGD) Average Monthly	0.724	0.48	0.711	0.569	0.601	0.601	0.727	0.842	0.502	0.371	0.329	0.369
Flow (MGD) Daily Maximum	1.859	1.1	1.894	1.592	1.37	1.771	1.807	1.604	1.62	1.62	0.748	1.62
pH (S.U.) Minimum	7.07	7.24	7.24	7.12	7.08	6.52	7.03	6.54	6.87	6.93	6.79	7.07
pH (S.U.) Maximum	7.75	7.59	7.82	8.0	7.78	7.64	7.89	7.49	7.56	7.44	7.46	7.4
DO (mg/L) Minimum	5.2	5.8	6.1	7.0	7.1	7.1	5.7	6.9	5.2	5.6	4.1	4.6
TRC (mg/L) Average Monthly	0.06	0.05	0.046	0.04	0.06	0.033	0.033	0.061	0.05	0.02	0.038	0.03
TRC (mg/L) Instantaneous Maximum	0.21	0.10	0.18	0.08	0.26	0.06	0.08	0.14	0.19	0.04	0.11	0.06
CBOD5 (lbs/day) Average Monthly	17.1	11	17	12	13.7	14	16	20	10	8	7	12
CBOD5 (lbs/day) Weekly Average	35.1	13	23	16	18.4	24	20	29	13	13	10	24
CBOD5 (mg/L) Average Monthly	3.1	3	3	3	3	3	3	3	3	3	3	3
CBOD5 (mg/L) Weekly Average	3.5	3	3	3	3	3	4	4	3	3	3	3
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	198	239	196	164	96	231	150	183	114	249	180	292
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	408	529	326	254	145	679	350	362	222	455	301	558
BOD5 (mg/L) Raw Sewage Influent Average Monthly	50	68.3	37	43	22	49	30.2	27	39	116.8	76.1	91.8
TSS (lbs/day) Average Monthly	23.9	30	49	47	35	48	63	134	18	26	20	17

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TSS (lbs/day) Raw Sewage Influent Average Monthly	202	302	229	333	47	267	219	271	168	319	349	470
TSS (lbs/day) Raw Sewage Influent Daily Maximum	352	716	353	1489	95	785	295	635	334	426	848	1108
TSS (lbs/day) Weekly Average	43.4	59	80	102	52.6	98	120	286	22	50	41	31
TSS (mg/L) Average Monthly	5.0	8	9	10	7.2	10	12	20	6	9	7	5
TSS (mg/L) Raw Sewage Influent Average Monthly	51	86	42	65	11	57	44	41	58	145	136	139
TSS (mg/L) Weekly Average	6.0	14	13	16	12	14	22	42	7	11	12	7
Fecal Coliform (CFU/100 ml) Geometric Mean	2	1.17	2	3	3	4	3	15	2	27	1	1
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	11	5	5	44	12	73	9	613	5	687	1	1
Total Nitrogen (lbs/day) Average Monthly	52.5	64	67	39	41	44	50	41	44	64	71	87
Total Nitrogen (mg/L) Average Monthly	12.38	18.7	12.54	10.57	8.49	9.58	8.99	6.36	12.91	23.9	24.2	20.17
Ammonia (lbs/day) Average Monthly	2.16	0.6	0.6	0.7	0.6	1	2	1	0.3	0.3	0.6	0.5
Ammonia (mg/L) Average Monthly	0.29	0.16	0.11	0.17	0.12	0.17	0.36	0.19	0.1	0.11	0.26	0.12
Total Phosphorus (lbs/day) Average Monthly	4.71	1.64	2	1	0.7	1	2	3	1	2	2	4
Total Phosphorus (mg/L) Average Monthly	0.65	0.38	0.32	0.27	0.16	0.29	0.45	0.44	0.34	0.74	0.94	0.92

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Development of Effluent Limitations

Outfall No.	001	Design Flow (MGD)	1.7
Latitude	41° 29' 51.00"	Longitude	-80° 27' 27.00"
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
CBOD ₅ (5/1 – 10/31)	15	Average Monthly	WQM 7.0 Version 1.1
NH ₃ -N (5/1 – 10/31)	6	Average Monthly	WQM 7.0 Version 1.1
NH ₃ -N (11/1 – 4/30)	10	Average Monthly	WQM 7.0 Version 1.1
Total Residual Chlorine	0.16	Average Monthly	TRC_CALC Spreadsheet
Total Residual Chlorine	0.53	IMAX	TRC_CALC Spreadsheet
Total Copper	0.022	Average Monthly	Toxics Management Spreadsheet Ver. 1.3
Total Copper	0.034	Daily Maximum	Toxics Management Spreadsheet Ver. 1.3
Benzo(a)Anthracene (ug/l)	0.019	Average Monthly	Toxics Management Spreadsheet Ver. 1.3
Benzo(a)Anthracene (ug/l)	0.029	Daily Maximum	Toxics Management Spreadsheet Ver. 1.3
Benzo(a)Pyrene (ug/l)	0.002	Average Monthly	Toxics Management Spreadsheet Ver. 1.3
Benzo(a)Pyrene (ug/l)	0.003	Daily Maximum	Toxics Management Spreadsheet Ver. 1.3
Benzo(k)Fluoranthene (ug/l)	0.19	Average Monthly	Toxics Management Spreadsheet Ver. 1.3
Benzo(k)Fluoranthene (ug/l)	0.29	Daily Maximum	Toxics Management Spreadsheet Ver. 1.3

Comments: Wintertime modeling was conducted for this discharge, although not current standard modeling procedure, due to the unique seasonal streamflow characteristics for this discharge and Jamestown Municipal STP's discharge due to release rates of the Pymatuning Dam, operated by USACOE. The calculated wintertime ammonia nitrogen limit is slightly more stringent than the current limit due primarily to new Chapter 93 water quality criteria for ammonia nitrogen which took effect early in 2021.

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The permittee indicated in their completed "Pre-Draft Permit Survey" that they were uncertain if they could meet the new WQBELs for total copper, benzo(a)anthracene, benzo(a)pyrene, and benzo(k)fluoranthene now or estimated date by which they would be able to meet the proposed WQBELs. Therefore, a compliance schedule of three years will be placed in the permit to meet the proposed WQBELs, with monitoring being conducted in the interim period along with special condition being placed in Part C of the permit requiring the permittee to conduct a Toxic Reduction Evaluation and site specific studies.

A phosphorus average monthly limit of 1.0 mg/l will be retained in the permit, based on the Shenango River Trophic State Index (TSI) Study.

The Toxic Management Spreadsheet also recommended monitoring for total aluminum, total zinc, and bis(2-ethylhexyl)phthalate. Monitoring will be placed in the permit for these parameters a reduced monitoring frequency of 2/month.

Best Professional Judgment (BPJ) Limitations

Comments: A dissolved oxygen limit of 4.0 mg/l as a daily minimum is placed in the permit in accordance with the Department's SOP entitled "Establishing Effluent Limitations for Individual Sewage Permits."

Other Considerations

Comments: Monitoring for influent BOD₅ and influent TSS is placed in the permit in accordance with the Department's SOP entitled "New and Reissuance Individual Sewage NPDES Permit Applications."

Monitoring for total nitrogen is placed in the permit in accordance with the Department's SOP entitled "Establishing Effluent Limitations for Individual Sewage Permits."

Anti-Backsliding

N/A

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Development of Effluent Limitations

Outfall No.	<u>002</u>	Design Flow (MGD)	<u>0</u>
Latitude	<u>41° 29' 59.00"</u>	Longitude	<u>-80° 27' 9.00"</u>
Wastewater Description: <u>Stormwater from STP Facility</u>			

Technology-Based Limitations

Comments: None

Water Quality-Based Limitations

Comments: No WQ modeling was conducted.

Best Professional Judgment (BPJ) Limitations

Comments: None

Anti-Backsliding

N/A

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Whole Effluent Toxicity (WET)

For Outfall 001, Acute Chronic WET Testing was completed:

- For the permit renewal application (4 tests).
- Quarterly throughout the permit term.
- Quarterly throughout the permit term and a TIE/TRE was conducted.
- Other: **Annually**

The dilution series used for the tests was: 100%, 62%, 24%, 12%, and 6%. The Target Instream Waste Concentration (TIWC) to be used for analysis of the results is: 24%.

Summary of Four Most Recent Test Results

TST Data Analysis

(NOTE – In lieu of recording information below, the application manager may attach the DEP WET Analysis Spreadsheet).

Test Date	Ceriodaphnia Results (Pass/Fail)		Pimephales Results (Pass/Fail)	
	Survival	Reproduction	Survival	Growth
4/18/2017	Pass	Pass	Pass	Pass
5/29/2018	Pass	Pass	Fail	Pass
7/17/2018	Pass	Pass	Pass	Pass
5/28/2019	Pass	Pass	Pass	Pass
3/03/2020	Pass	Pass	Pass	Pass

* A "passing" result is that in which the replicate data for the TIWC is not statistically significant from the control condition. This is exhibited when the calculated t value ("T-Test Result") is greater than the critical t value. A "failing" result is exhibited when the calculated t value ("T-Test Result") is less than the critical t value.

Is there reasonable potential for an excursion above water quality standards based on the results of these tests? (NOTE – In general, reasonable potential is determined anytime there is at least one test failure in the previous four tests).

YES NO

Comments: One failure was found for Pimephales Promelas survival. A retest resulted in a passing test. In conversations with the permittee, the cause of the failure is believed to be due to a load delivered from a septage hauler on the day the samples were collected. The permittee has indicated that the facility is no longer accepting waste from that hauler (Bell Sanitation).

Evaluation of Test Type, IWC and Dilution Series for Renewed Permit

Acute Partial Mix Factor (PMFa): **0.340**

Chronic Partial Mix Factor (PMFc): **1.0**

1. Determine IWC – Acute (IWCa):

$$(Q_d \times 1.547) / ((Q_{7-10} \times PMFa) + (Q_d \times 1.547))$$

$$[(1.7 \text{ MGD} \times 1.547) / ((8.145 \text{ cfs} \times 0.34) + (1.7 \text{ MGD} \times 1.547))] \times 100 = \mathbf{49\%}$$

Is IWCa < 1%? YES NO

If the discharge is to the tidal portion of the Delaware River, indicate how the type of test was determined:

N/A

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Type of Test for Permit Renewal: Chronic

2b. Determine Target IWCc (If Chronic Tests Required)

$$(Q_d \times 1.547) / (Q_{7-10} \times \text{PMFc}) + (Q_d \times 1.547)$$

$$[(1.7 \text{ MGD} \times 1.547) / ((8.145 \text{ cfs} \times 1) + (1.7 \text{ MGD} \times 1.547))] \times 100 = \mathbf{24\%}$$

3. Determine Dilution Series

Dilution Series = 100%, 62%, 24%, 12%, and 6%.

WET Limits

Has reasonable potential been determined? YES NO

Will WET limits be established in the permit? YES NO

If WET limits will be established, identify the species and the limit values for the permit (TU).

N/A

If WET limits will not be established, but reasonable potential was determined, indicate the rationale for not establishing WET limits:

The reported WETT endpoint failure was the only failed test in the previous nine WET tests. Since the facility does not have any industrial users, there have been no changes to the dilution series in that period or in the proposed renewed permit, and a logical explanation and action was taken for the one failed test, it was decided not to impose WET limits in the proposed renewed permit.

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Threatened and Endangered Mussel Species Concerns and Considerations

The main segment of the Shenango River from the Pymatuning Dam in Jamestown, Pennsylvania, downstream to the point of inundation by Shenango River Lake near Big Bend, Mercer County, Pennsylvania, is documented to contain federally and state listed threatened and endangered mussel species. Due to the discharge being directly to the Allegheny River, potential impacts to endangered mussel species were evaluated.

The USFWS has indicated in comment letters on other NPDES permits that in order to protect threatened and endangered mussel species, wastewater discharges containing ammonia-nitrogen (NH₃-N), chloride (Cl⁻), dissolved nickel, and dissolved zinc where mussels or their habitat exist, where mussels or their habitat exist, can be no more than 1.9 mg/l, 78 mg/l, 7.3 µg/l, and 13.18 µg/l, respectively. The calculated site-specific criteria based on WQN Station 911 stream background pH and temperature data (pH of 7.71 and temperature of 20.24) results in NH₃-N criteria of 1.113 mg/l.

Ammonia-Nitrogen (NH₃-N) Evaluation:

The following is a summary of the Ammonia-Nitrogen eDMR average monthly reporting data:

Ammonia-Nitrogen (NH ₃ -N) Sampling Data (eDMR Reporting)													
Ammonia-Nitrogen (NH ₃ -N) 24-hour composite samples (mg/L)/(Average Monthly)	Year	January	February	March	April	May	June	July	August	September	October	November	December
	2018	0.11	0.22	0.17	0.1	0.1	0.12	0.33	0.15	0.21	0.1	0.11	0.1
	2019	0.11	0.12	0.16	0.13	0.12	0.1	0.14	0.14	0.11	0.16	0.35	0.45
	2020	0.94	.65	.67	.46	.12	.26	.12	.12	.26	.11	.1	.19
	2021	0.36	.17	.12	.17	.11	.16	.29	.18	.17	.37	.11	0.15

Note: NSSJMA's current NPDES permit has 2/week NH₃-N monitoring with a summertime average monthly limit of 6.0.0 mg/L (12 mg/L IMAX) and a wintertime average monthly limit of 11.0 mg/L (22 mg/L IMAX).

The proposed permit limits for Ammonia-Nitrogen in the new permit cycle were as follows:

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		
Ammonia-Nitrogen May 1 - Oct 31	85	XXX	XXX	6.0	XXX	12	2/week	24-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	141	XXX	XXX	10.0	XXX	20	2/week	24-Hr Composite

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The limits in the existing permit were calculated utilizing the Department DO model (WQM 7.0) which assumes a complete mix of the effluent with the receiving stream. The WQM 7.0 model was reevaluated as part of the subject permit renewal using the newly adopted ammonia-nitrogen water quality criteria (same as 2013 EPA CMG).

As can be seen from the eDMR data for the past four years, the highest average monthly ammonia nitrogen concentration in the effluent was 0.94 mg/l, with average – average monthly value being 0.213 mg/l. This indicates that the facility consistently denitrifying the municipal sewage to a high degree and easily meeting the calculated WQBELs in the permit. There is no perceived impact due to ammonia nitrogen with the max average monthly concentration because it is less than the most stringent WQ criteria.

A summary of the sampling data for chloride, total nickel, and total zinc based on three effluent samples and one influent sample at Outfall 001 for the 2020 renewal application is as follows:

PARAMETER	UNITS	3/03/2020	3/05/2020	2/10/2020	Influent 1/15/2020
Chloride	mg/l	29.7	26	35.2	18.7
Total Nickel	µg/l	1	0.6	0.7	0.9
Total Zinc	µg/l	30	11	22	10

The Endangered Mussel Species Impact Area Calculations Spreadsheet (attached) was completed using the maximum discharge concentrations for ammonia nitrogen, chloride, total nickel, and zinc. As was expected, there were no calculated mussel impacts due to ammonia nitrogen, chloride and total nickel because all reported application data for these parameters were less than USFWS stated criteria. There was however a significant area of impact calculated due to total zinc (approximately 246-262 square meters.)

With the exception of discharging potentially elevated levels of total zinc, the North & South Shenango Joint STP facility is not believed to be having any measurable adverse effects on threatened or endangered mussel species in the Shenango River. However, the Department will establish quarterly effluent sampling for chloride and total nickel to develop a dataset as a means of further evaluating potential impacts to threatened and endangered mussels in the upcoming permit term. Twice a month monitoring for zinc will also be placed in the permit for reasoning discussed on Page 9 of this Fact Sheet, which will also aid in further evaluating potential impacts to threatened and endangered mussels. A Part C condition will also be added requiring the permittee conduct a total zinc reduction evaluation.

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 April 30, 2025

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) ⁽¹⁾		Concentrations (mg/L)				Minimum ⁽²⁾ Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Copper, Total	Report	Report	XXX	Report	Report	XXX	1/week	24-Hr Composite
Benzo(a)Anthracene (ug/L)	Report	Report	XXX	Report	Report	XXX	1/week	24-Hr Composite
Benzo(a)Pyrene (ug/L)	Report	Report	XXX	Report	Report	XXX	1/week	24-Hr Composite
Benzo(k)Fluoranthene (ug/L)	Report	Report	XXX	Report	Report	XXX	1/week	24-Hr Composite

Compliance Sampling Location: Outfall 001 (after disinfection)

Other Comments:

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: May 1, 2025 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	Daily Maximum	Minimum	Average Monthly	Daily Maximum			Instant. Maximum
Copper, Total	0.32	0.49	XXX	0.22	0.34	0.55	1/week	24-Hr Composite
Benzo(a)Anthracene (ug/L)	0.035	0.035	XXX	2.5	2.5	2.5	1/week	24-Hr Composite
Benzo(a)Pyrene (ug/L)	0.035	0.035	XXX	2.5	2.5	2.5	1/week	24-Hr Composite
Benzo(k)Fluoranthene (ug/L)	0.035	0.035	XXX	2.5	2.5	2.5	1/week	24-Hr Composite

Compliance Sampling Location: Outfall 001 (after disinfection)

Other Comments:

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	Daily Maximum	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report	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	4.0 Daily Min	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.16	0.53 Daily Max	XXX	1/day	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5) Nov 1 - Apr 30	354	567 Wkly Avg	XXX	25	40	50	2/week	24-Hr Composite
Carbonaceous Biochemical Oxygen Demand (CBOD5) May 1 - Oct 31	212	311 Wkly Avg	XXX	15	22	30	2/week	24-Hr Composite
Biochemical Oxygen Demand (BOD5) Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Total Suspended Solids	425	638 Wkly Avg	XXX	30	45	60	2/week	24-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/week	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/week	Grab

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Outfall 001 , Continued (from Permit Effective Date through Permit Expiration Date)

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) ⁽¹⁾		Minimum	Concentrations (mg/L)			Minimum ⁽²⁾ Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum		Average Monthly	Weekly Average	Instant. Maximum		
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/month	Grab
Total Nitrogen	Report	XXX	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	141	XXX	XXX	10.0	XXX	20	2/week	24-Hr Composite
Ammonia-Nitrogen May 1 - Oct 31	85	XXX	XXX	6	XXX	12	2/week	24-Hr Composite
Total Phosphorus	14	XXX	XXX	1.0	XXX	2	2/week	24-Hr Composite
Aluminum, Total	Report	Report	XXX	Report	Report Daily Max	XXX	2/month	24-Hr Composite
Nickel, Total	XXX	Report	XXX	XXX	Report Daily Max	XXX	1/quarter	24-Hr Composite
Zinc, Total	Report	Report	XXX	Report	Report Daily Max	XXX	2/month	24-Hr Composite
Chloride	XXX	Report	XXX	XXX	Report Daily Max	XXX	1/quarter	24-Hr Composite
Bis(2-Ethylhexyl)Phthalate (ug/L)	Report	Report	XXX	Report	Report Daily Max	XXX	2/month	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
20A	35482	SHENANGO RIVER	68.200	978.00	167.00	0.00000	0.00	<input checked="" type="checkbox"/>

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		Stream	
									Temp (°C)	pH	Temp (°C)	pH
Q7-10	0.023	11.21	0.00	0.000	0.000	0.0	0.00	0.00	20.24	7.71	0.00	0.00
Q1-10			0.00	0.000	0.000							
Q30-10			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
NSSJMA STP	PA0100277	1.7000	0.0000	0.0000	0.000	20.00	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	2.20	0.00	1.50
Dissolved Oxygen	4.00	8.24	0.00	0.00
NH3-N	25.00	0.11	0.00	0.70

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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
20A	35482	SHENANGO RIVER	66.340	968.00	170.80	0.00000	0.00	<input checked="" type="checkbox"/>

Stream Data

Design Cond.	LFY	Trib Flow	Stream Flow	Rch Trav Time	Rch Velocity	WD Ratio	Rch Width	Rch Depth	Tributary Temp	Tributary pH	Stream Temp	Stream pH
	(cfsm)	(cfs)	(cfs)	(days)	(fps)		(ft)	(ft)	(°C)		(°C)	
Q7-10	0.023	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.24	7.71	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
Jamestown STP	PA0029726	0.2600	0.0000	0.0000	0.000	20.00	7.10

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.20	0.00	1.50
Dissolved Oxygen	4.00	8.24	0.00	0.00
NH3-N	25.00	0.11	0.00	0.70

NPDES Permit Fact Sheet

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 North & South Shenango Joint STP

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
20A	35482	SHENANGO RIVER	62.000	949.00	183.60	0.00000	0.00	<input checked="" type="checkbox"/>

Stream Data

Design Cond.	LFY	Trib Flow	Stream Flow	Rch Trav Time	Rch Velocity	WD Ratio	Rch Width	Rch Depth	Tributary Temp	Tributary pH	Stream Temp	Stream pH
	(cfsm)	(cfs)	(cfs)	(days)	(fps)		(ft)	(ft)	(°C)		(°C)	
Q7-10	0.023	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.24	7.71	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

NPDES Permit Fact Sheet

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WQM 7.0 Hydrodynamic Outputs

<u>SWP Basin</u>		<u>Stream Code</u>				<u>Stream Name</u>						
20A		35482				SHENANGO RIVER						
RMI	Stream Flow	PWS With	Net Stream Flow	Disc Analysis Flow	Reach Slope	Depth	Width	W/D Ratio	Velocity	Reach Trav Time	Analysis Temp	Analysis pH
	(cfs)	(cfs)	(cfs)	(cfs)	(ft/ft)	(ft)	(ft)		(fps)	(days)	(°C)	
Q7-10 Flow												
68.200	11.21	0.00	11.21	2.6299	0.00102	.845	62.99	74.56	0.26	0.437	20.19	7.46
66.340	11.30	0.00	11.30	3.0321	0.00083	.855	64.64	75.64	0.26	1.022	20.19	7.44
Q1-10 Flow												
68.200	7.17	0.00	7.17	2.6299	0.00102	NA	NA	NA	0.21	0.530	20.18	7.39
66.340	7.23	0.00	7.23	3.0321	0.00083	NA	NA	NA	0.22	1.233	20.17	7.37
Q30-10 Flow												
68.200	15.25	0.00	15.25	2.6299	0.00102	NA	NA	NA	0.30	0.379	20.20	7.50
66.340	15.36	0.00	15.36	3.0321	0.00083	NA	NA	NA	0.30	0.889	20.20	7.49

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WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	<input checked="" type="checkbox"/>
WLA Method	EMPR	Use Inputted W/D Ratio	<input checked="" type="checkbox"/>
Q1-10/Q7-10 Ratio	0.64	Use Inputted Reach Travel Times	<input type="checkbox"/>
Q30-10/Q7-10 Ratio	1.36	Temperature Adjust Kr	<input checked="" type="checkbox"/>
D.O. Saturation	90.00%	Use Balanced Technology	<input checked="" type="checkbox"/>
D.O. Goal	5		

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WQM 7.0 Wasteload Allocations

SWP Basin Stream Code Stream Name
 20A 35482 SHENANGO RIVER

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
68.200	NSSJMA STP	10.71	39.64	10.71	39.64	0	0
66.340	Jamestown STP	7.22	50	10.93	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
68.200	NSSJMA STP	1.37	8.68	1.37	7.52	2	13
66.340	Jamestown STP	1.15	25	1.39	21.67	2	13

Dissolved Oxygen Allocations

RMI	Discharge Name	<u>CBOD5</u>		<u>NH3-N</u>		<u>Dissolved Oxygen</u>		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
68.20	NSSJMA STP	22.6	18.34	7.52	6.15	4	4	2	19
66.34	Jamestown STP	25	25	21.67	16.12	4	4	2	19

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WQM 7.0 D.O.Simulation

<u>SWP Basin</u>	<u>Stream Code</u>	<u>Stream Name</u>	
20A	35482	SHENANGO RIVER	
<u>RM</u>	<u>Total Discharge Flow (mgd)</u>	<u>Analysis Temperature (°C)</u>	<u>Analysis pH</u>
68.200	1.700	20.194	7.458
<u>Reach Width (ft)</u>	<u>Reach Depth (ft)</u>	<u>Reach WDRatio</u>	<u>Reach Velocity (fps)</u>
62.992	0.845	74.563	0.260
<u>Reach CBOD5 (mg/L)</u>	<u>Reach Kc (1/days)</u>	<u>Reach NH3-N (mg/L)</u>	<u>Reach Kn (1/days)</u>
5.27	0.666	1.26	0.711
<u>Reach DO (mg/L)</u>	<u>Reach Kr (1/days)</u>	<u>Kr Equation</u>	<u>Reach DO Goal (mg/L)</u>
7.437	1.815	Tsivoglou	5
<u>Reach Travel Time (days)</u>	Subreach Results		
0.437	<u>TravTime (days)</u>	<u>CBOD5 (mg/L)</u>	<u>NH3-N (mg/L)</u>
			<u>D.O. (mg/L)</u>
	0.044	5.11	1.22
	0.087	4.97	1.18
	0.131	4.82	1.15
	0.175	4.68	1.11
	0.219	4.55	1.08
	0.262	4.42	1.04
	0.306	4.29	1.01
	0.350	4.16	0.98
	0.393	4.04	0.95
	0.437	3.93	0.92
			7.18
			6.95
			6.75
			6.58
			6.43
			6.30
			6.19
			6.10
			6.02
			5.96
<u>RM</u>	<u>Total Discharge Flow (mgd)</u>	<u>Analysis Temperature (°C)</u>	<u>Analysis pH</u>
66.340	1.960	20.189	7.444
<u>Reach Width (ft)</u>	<u>Reach Depth (ft)</u>	<u>Reach WDRatio</u>	<u>Reach Velocity (fps)</u>
64.641	0.855	75.644	0.259
<u>Reach CBOD5 (mg/L)</u>	<u>Reach Kc (1/days)</u>	<u>Reach NH3-N (mg/L)</u>	<u>Reach Kn (1/days)</u>
4.51	0.552	1.34	0.710
<u>Reach DO (mg/L)</u>	<u>Reach Kr (1/days)</u>	<u>Kr Equation</u>	<u>Reach DO Goal (mg/L)</u>
5.922	1.474	Tsivoglou	5
<u>Reach Travel Time (days)</u>	Subreach Results		
1.022	<u>TravTime (days)</u>	<u>CBOD5 (mg/L)</u>	<u>NH3-N (mg/L)</u>
			<u>D.O. (mg/L)</u>
	0.102	4.26	1.25
	0.204	4.02	1.16
	0.307	3.80	1.08
	0.409	3.59	1.00
	0.511	3.39	0.93
	0.613	3.20	0.87
	0.716	3.03	0.81
	0.818	2.86	0.75
	0.920	2.70	0.70
	1.022	2.55	0.65
			5.62
			5.42
			5.28
			5.20
			5.18
			5.19
			5.24
			5.31
			5.40
			5.51

NPDES Permit Fact Sheet

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 North & South Shenango Joint STP

WQM 7.0 Effluent Limits

<u>SWP Basin</u>		<u>Stream Code</u>		<u>Stream Name</u>			
20A		35482		SHENANGO RIVER			
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)
68.200	NSSJMA STP	PA0100277	1.700	CBOD5	18.34		
				NH3-N	6.15	12.3	
				Dissolved Oxygen			4
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)
66.340	Jamestown STP	PA0029726	0.260	CBOD5	25		
				NH3-N	16.12	32.24	
				Dissolved Oxygen			4

NPDES Permit Fact Sheet

NPDES Permit No. PA0100277
 North & South Shenango Joint STP

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
20A	35482	SHENANGO RIVER	68.200	978.00	167.00	0.00000	0.00	<input checked="" type="checkbox"/>

Stream Data

Design Cond.	LFY	Trib Flow	Stream Flow	Rch Trav Time	Rch Velocity	WD Ratio	Rch Width	Rch Depth	Tributary Temp	Tributary pH	Stream Temp	Stream pH
	(cfsm)	(cfs)	(cfs)	(days)	(fps)		(ft)	(ft)	(°C)		(°C)	
Q7-10	0.023	8.15	0.00	0.000	0.000	0.0	0.00	0.00	4.71	7.71	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
NSSJMA STP	PA0100277	1.7000	0.0000	0.0000	0.000	15.00	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	2.20	0.00	1.50
Dissolved Oxygen	4.00	8.24	0.00	0.00
NH3-N	25.00	0.11	0.00	0.70

NPDES Permit Fact Sheet

NPDES Permit No. PA0100277
 North & South Shenango Joint STP

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
20A	35482	SHENANGO RIVER	66.340	968.00	170.80	0.00000	0.00	<input checked="" type="checkbox"/>

Stream Data

Design Cond.	LFY	Trib Flow	Stream Flow	Rch Trav Time	Rch Velocity	WD Ratio	Rch Width	Rch Depth	Tributary Temp	Tributary pH	Stream Temp	Stream pH
	(cfsm)	(cfs)	(cfs)	(days)	(fps)		(ft)	(ft)	(°C)		(°C)	
Q7-10	0.023	0.00	0.00	0.000	0.000	0.0	0.00	0.00	4.71	7.71	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
Jamestown STP	PA0029726	0.2600	0.0000	0.0000	0.000	15.00	7.10

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.20	0.00	1.50
Dissolved Oxygen	4.00	8.24	0.00	0.00
NH3-N	25.00	0.11	0.00	0.70

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 North & South Shenango Joint STP

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
20A	35482	SHENANGO RIVER	62.000	949.00	183.60	0.00000	0.00	<input checked="" type="checkbox"/>

Stream Data

Design Cond.	LFY	Trib Flow	Stream Flow	Rch Trav Time	Rch Velocity	WD Ratio	Rch Width	Rch Depth	Tributary Temp	Tributary pH	Stream Temp	Stream pH
	(cfsm)	(cfs)	(cfs)	(days)	(fps)		(ft)	(ft)	(°C)		(°C)	
Q7-10	0.023	0.00	0.00	0.000	0.000	0.0	0.00	0.00	4.71	7.71	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

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 North & South Shenango Joint STP

WQM 7.0 Hydrodynamic Outputs

<u>SWP Basin</u>		<u>Stream Code</u>				<u>Stream Name</u>						
20A		35482				SHENANGO RIVER						
RMI	Stream Flow	PWS With	Net Stream Flow	Disc Analysis Flow	Reach Slope	Depth	Width	W/D Ratio	Velocity	Reach Trav Time	Analysis Temp	Analysis pH
	(cfs)	(cfs)	(cfs)	(cfs)	(ft/ft)	(ft)	(ft)		(fps)	(days)	(°C)	
Q7-10 Flow												
68.200	8.15	0.00	8.15	2.6299	0.00102	.826	57.75	69.95	0.23	0.503	7.22	7.41
66.340	8.24	0.00	8.24	3.0321	0.00083	.836	59.44	71.1	0.23	1.170	7.48	7.39
Q1-10 Flow												
68.200	5.22	0.00	5.22	2.6299	0.00102	NA	NA	NA	0.19	0.601	8.16	7.33
66.340	5.27	0.00	5.27	3.0321	0.00083	NA	NA	NA	0.19	1.388	8.47	7.32
Q30-10 Flow												
68.200	11.08	0.00	11.08	2.6299	0.00102	NA	NA	NA	0.26	0.439	6.68	7.46
66.340	11.20	0.00	11.20	3.0321	0.00083	NA	NA	NA	0.26	1.026	6.90	7.44

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North & South Shenango Joint STP

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	<input checked="" type="checkbox"/>
WLA Method	EMPR	Use Inputted W/D Ratio	<input checked="" type="checkbox"/>
Q1-10/Q7-10 Ratio	0.64	Use Inputted Reach Travel Times	<input type="checkbox"/>
Q30-10/Q7-10 Ratio	1.36	Temperature Adjust Kr	<input checked="" type="checkbox"/>
D.O. Saturation	90.00%	Use Balanced Technology	<input checked="" type="checkbox"/>
D.O. Goal	5		

NPDES Permit Fact Sheet

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 North & South Shenango Joint STP

WQM 7.0 Wasteload Allocations

SWP Basin Stream Code Stream Name
 20A 35482 SHENANGO RIVER

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
68.200	NSSJMA STP	16.79	49.87	16.79	49.87	0	0
66.340	Jamestown STP	10.94	50	17.07	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
68.200	NSSJMA STP	3.34	16.96	3.34	15.9	2	6
66.340	Jamestown STP	2.74	25	3.38	23.44	2	6

Dissolved Oxygen Allocations

RMI	Discharge Name	<u>CBOD5</u>		<u>NH3-N</u>		<u>Dissolved Oxygen</u>		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
68.20	NSSJMA STP	25	25	14.7	10.45	4	4	2	19
66.34	Jamestown STP	25	25	23.44	17.57	4	4	2	19

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WQM 7.0 D.O.Simulation

<u>SWP Basin</u>	<u>Stream Code</u>	<u>Stream Name</u>		
20A	35482	SHENANGO RIVER		
<u>RMI</u>	<u>Total Discharge Flow (mgd)</u>	<u>Analysis Temperature (°C)</u>		<u>Analysis pH</u>
68.200	1.700	7.220		7.407
<u>Reach Width (ft)</u>	<u>Reach Depth (ft)</u>	<u>Reach WDRatio</u>		<u>Reach Velocity (fps)</u>
57.748	0.826	69.949		0.226
<u>Reach CBOD5 (mg/L)</u>	<u>Reach Kc (1/days)</u>	<u>Reach NH3-N (mg/L)</u>		<u>Reach Kn (1/days)</u>
7.76	1.121	2.63		0.262
<u>Reach DO (mg/L)</u>	<u>Reach Kr (1/days)</u>	<u>Kr Equation</u>		<u>Reach DO Goal (mg/L)</u>
7.208	1.160	Tsivoglou		5
<u>Reach Travel Time (days)</u>	Subreach Results			
0.503	<u>TravTime (days)</u>	<u>CBOD5 (mg/L)</u>	<u>NH3-N (mg/L)</u>	<u>D.O. (mg/L)</u>
	0.050	7.52	2.60	6.98
	0.101	7.29	2.56	6.78
	0.151	7.07	2.53	6.60
	0.201	6.85	2.50	6.44
	0.251	6.64	2.46	6.31
	0.302	6.43	2.43	6.19
	0.352	6.23	2.40	6.09
	0.402	6.04	2.37	6.01
	0.452	5.85	2.34	5.94
	0.503	5.67	2.31	5.89
<u>RMI</u>	<u>Total Discharge Flow (mgd)</u>	<u>Analysis Temperature (°C)</u>		<u>Analysis pH</u>
66.340	1.960	7.479		7.393
<u>Reach Width (ft)</u>	<u>Reach Depth (ft)</u>	<u>Reach WDRatio</u>		<u>Reach Velocity (fps)</u>
59.445	0.836	71.104		0.227
<u>Reach CBOD5 (mg/L)</u>	<u>Reach Kc (1/days)</u>	<u>Reach NH3-N (mg/L)</u>		<u>Reach Kn (1/days)</u>
6.34	0.959	2.84		0.267
<u>Reach DO (mg/L)</u>	<u>Reach Kr (1/days)</u>	<u>Kr Equation</u>		<u>Reach DO Goal (mg/L)</u>
5.837	0.953	Tsivoglou		5
<u>Reach Travel Time (days)</u>	Subreach Results			
1.170	<u>TravTime (days)</u>	<u>CBOD5 (mg/L)</u>	<u>NH3-N (mg/L)</u>	<u>D.O. (mg/L)</u>
	0.117	5.95	2.75	5.56
	0.234	5.58	2.66	5.35
	0.351	5.24	2.58	5.21
	0.468	4.92	2.50	5.12
	0.585	4.62	2.43	5.08
	0.702	4.34	2.35	5.09
	0.819	4.07	2.28	5.12
	0.936	3.82	2.21	5.19
	1.053	3.59	2.14	5.28
	1.170	3.37	2.07	5.38

NPDES Permit Fact Sheet

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 North & South Shenango Joint STP

WQM 7.0 Effluent Limits

<u>SWP Basin</u>		<u>Stream Code</u>		<u>Stream Name</u>			
20A		35482		SHENANGO RIVER			
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)
68.200	NSSJMA STP	PA0100277	1.700	CBOD5	25		
				NH3-N	10.45	20.9	
				Dissolved Oxygen			4
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)
66.340	Jamestown STP	PA0029726	0.260	CBOD5	25		
				NH3-N	17.57	35.14	
				Dissolved Oxygen			4

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NPDES Permit No. PA0100277
North & South Shenango Joint STP



Toxics Management Spreadsheet
Version 1.3, March 2021

Discharge Information

Instructions Discharge Stream

Facility: North & South Shenango Joint STP NPDES Permit No.: PA0100277 Outfall No.: 001
Evaluation Type: Major Sewage / Industrial Waste Wastewater Description: Domestic Sewage

Discharge Characteristics								
Design Flow (MGD)*	Hardness (mg/l)*	pH (SU)*	Partial Mix Factors (PMFs)				Complete Mix Times (min)	
			AFC	CFC	THH	CRL	Q ₇₋₁₀	Q _h
1.7	177.3	7						

Discharge Pollutant	Units	Max Discharge Conc	0 if left blank		0.5 if left blank		0 if left blank			1 if left blank	
			Trib Conc	Stream Conc	Daily CV	Hourly CV	Stream CV	Fate Coeff	FOS	Criteria Mod	Chem Transl
Group 1	Total Dissolved Solids (PWS)	mg/L	294	104							
	Chloride (PWS)	mg/L	35.2	9.47							
	Bromide	mg/L	< 0.1								
	Sulfate (PWS)	mg/L	26.2	8.78							
	Fluoride (PWS)	mg/L									
Group 2	Total Aluminum	µg/L	290								
	Total Antimony	µg/L	0.1								
	Total Arsenic	µg/L	0.9								
	Total Barium	µg/L	27								
	Total Beryllium	µg/L	< 0.05								
	Total Boron	µg/L	< 100								
	Total Cadmium	µg/L	< 0.08								
	Total Chromium (III)	µg/L	1								
	Hexavalent Chromium	µg/L	< 0.1								
	Total Cobalt	µg/L	0.2								
	Total Copper	µg/L	14								
	Free Cyanide	µg/L	1								
	Total Cyanide	µg/L	3								
	Dissolved Iron	µg/L	< 20								
	Total Iron	µg/L	570								
	Total Lead	µg/L	0.8								
	Total Manganese	µg/L	110								
	Total Mercury	µg/L	< 0.1								
	Total Nickel	µg/L	1								
	Total Phenols (Phenolics) (PWS)	µg/L	< 5								
	Total Selenium	µg/L	< 5								
	Total Silver	µg/L	< 0.05								
	Total Thallium	µg/L	< 2								
Total Zinc	µg/L	30									
Total Molybdenum	µg/L	0.4									
Acrolein	µg/L	< 0.9									
Acrylamide	µg/L	<									
Acrylonitrile	µg/L	< 0.5									
Benzene	µg/L	< 0.5									
Bromoform	µg/L	< 0.5									

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Stream / Surface Water Information

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Instructions Discharge Stream

Receiving Surface Water Name: Shenango River

No. Reaches to Model: 1

- Statewide Criteria
- Great Lakes Criteria
- ORSANCO Criteria

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi ²)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	035482	68.2	978	167			Yes
End of Reach 1	035482	57	934	302.6		2	Yes

Q₇₋₁₀

Location	RMI	LFY (cfs/mi ²)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	68.2	0.023	8.145									70	7.71		
End of Reach 1	57	0.151	45.7									70	7.71		

Q_h

Location	RMI	LFY (cfs/mi ²)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	68.2														
End of Reach 1	57														

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Model Results

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All
 Inputs
 Results
 Limits

Hydrodynamics

Q₇₋₁₀

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
68.2	8.15		8.15	2.63	0.00074	0.834	58.639	70.283	0.22	3.108	129.554
57	45.70	3.094	42.606								

Q_n

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
68.2	46.46		46.46	2.63	0.00074	1.626	58.639	36.063	0.515	1.329	74.643
57	209.776	3.094	206.68								

Wasteload Allocations

AFC

CCT (min):

PMF:

Analysis Hardness (mg/l):

Analysis pH:

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	104000	0		0	N/A	N/A	N/A	
Chloride (PWS)	9470	0		0	N/A	N/A	N/A	
Sulfate (PWS)	8780	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	750	750	1,540	
Total Antimony	0	0		0	1,100	1,100	2,259	
Total Arsenic	0	0		0	340	340	698	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	43,131	
Total Boron	0	0		0	8,100	8,100	16,636	
Total Cadmium	0	0		0	2.448	2.62	5.37	Chem Translator of 0.936 applied
Total Chromium (III)	0	0		0	671.635	2,125	4,365	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	33.5	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	195	
Total Copper	0	0		0	16.239	16.9	34.7	Chem Translator of 0.96 applied

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Free Cyanide	0	0	0	22	22.0	45.2	
Dissolved Iron	0	0	0	N/A	N/A	N/A	
Total Iron	0	0	0	N/A	N/A	N/A	
Total Lead	0	0	0	80,311	105	217	Chem Translator of 0.762 applied
Total Manganese	0	0	0	N/A	N/A	N/A	
Total Mercury	0	0	0	1.400	1.65	3.38	Chem Translator of 0.85 applied
Total Nickel	0	0	0	554,956	556	1,142	Chem Translator of 0.998 applied
Total Phenols (Phenolics) (PWS)	0	0	0	N/A	N/A	N/A	
Total Selenium	0	0	0	N/A	N/A	N/A	Chem Translator of 0.922 applied
Total Silver	0	0	0	4,544	5.35	11.0	Chem Translator of 0.85 applied
Total Thallium	0	0	0	65	65.0	133	
Total Zinc	0	0	0	138,919	142	292	Chem Translator of 0.978 applied
Acrolein	0	0	0	3	3.0	6.16	
Acrylonitrile	0	0	0	650	650	1,335	
Benzene	0	0	0	640	640	1,314	
Bromoform	0	0	0	1,800	1,800	3,697	
Carbon Tetrachloride	0	0	0	2,800	2,800	5,751	
Chlorobenzene	0	0	0	1,200	1,200	2,465	
Chlorodibromomethane	0	0	0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0	0	18,000	18,000	36,969	
Chloroform	0	0	0	1,900	1,900	3,902	
Dichlorobromomethane	0	0	0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0	0	15,000	15,000	30,808	
1,1-Dichloroethylene	0	0	0	7,500	7,500	15,404	
1,2-Dichloropropane	0	0	0	11,000	11,000	22,592	
1,3-Dichloropropylene	0	0	0	310	310	637	
Ethylbenzene	0	0	0	2,900	2,900	5,956	
Methyl Bromide	0	0	0	550	550	1,130	
Methyl Chloride	0	0	0	28,000	28,000	57,507	
Methylene Chloride	0	0	0	12,000	12,000	24,646	
1,1,2,2-Tetrachloroethane	0	0	0	1,000	1,000	2,054	
Tetrachloroethylene	0	0	0	700	700	1,438	
Toluene	0	0	0	1,700	1,700	3,492	
1,2-trans-Dichloroethylene	0	0	0	6,800	6,800	13,966	
1,1,1-Trichloroethane	0	0	0	3,000	3,000	6,162	
1,1,2-Trichloroethane	0	0	0	3,400	3,400	6,983	
Trichloroethylene	0	0	0	2,300	2,300	4,724	
Vinyl Chloride	0	0	0	N/A	N/A	N/A	
2-Chlorophenol	0	0	0	560	560	1,150	
2,4-Dichlorophenol	0	0	0	1,700	1,700	3,492	
2,4-Dimethylphenol	0	0	0	660	660	1,356	
4,6-Dinitro-o-Cresol	0	0	0	80	80.0	164	
2,4-Dinitrophenol	0	0	0	660	660	1,356	
2-Nitrophenol	0	0	0	8,000	8,000	16,431	
4-Nitrophenol	0	0	0	2,300	2,300	4,724	
p-Chloro-m-Cresol	0	0	0	160	160	329	
Pentachlorophenol	0	0	0	11,007	11.0	22.6	

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Phenol	0	0	0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0	0	460	460	945	
Acenaphthene	0	0	0	83	83.0	170	
Anthracene	0	0	0	N/A	N/A	N/A	
Benzidine	0	0	0	300	300	616	
Benzo(a)Anthracene	0	0	0	0.5	0.5	1.03	
Benzo(a)Pyrene	0	0	0	N/A	N/A	N/A	
3,4-Benzofluoranthene	0	0	0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0	0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0	0	30,000	30,000	61,615	
Bis(2-Chloroisopropyl)Ether	0	0	0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0	0	4,500	4,500	9,242	
4-Bromophenyl Phenyl Ether	0	0	0	270	270	555	
Butyl Benzyl Phthalate	0	0	0	140	140	288	
2-Chloronaphthalene	0	0	0	N/A	N/A	N/A	
Chrysene	0	0	0	N/A	N/A	N/A	
Dibenzo(a,h)Anthracene	0	0	0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0	0	820	820	1,684	
1,3-Dichlorobenzene	0	0	0	350	350	719	
1,4-Dichlorobenzene	0	0	0	730	730	1,499	
3,3-Dichlorobenzidine	0	0	0	N/A	N/A	N/A	
Diethyl Phthalate	0	0	0	4,000	4,000	8,215	
Dimethyl Phthalate	0	0	0	2,500	2,500	5,135	
Di-n-Butyl Phthalate	0	0	0	110	110	226	
2,4-Dinitrotoluene	0	0	0	1,600	1,600	3,286	
2,6-Dinitrotoluene	0	0	0	990	990	2,033	
1,2-Diphenylhydrazine	0	0	0	15	15.0	30.8	
Fluoranthene	0	0	0	200	200	411	
Fluorene	0	0	0	N/A	N/A	N/A	
Hexachlorobenzene	0	0	0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0	0	10	10.0	20.5	
Hexachlorocyclopentadiene	0	0	0	5	5.0	10.3	
Indeno(1,2,3-cd)Pyrene	0	0	0	N/A	N/A	N/A	
Isophorone	0	0	0	10,000	10,000	20,538	
Naphthalene	0	0	0	140	140	288	
Nitrobenzene	0	0	0	4,000	4,000	8,215	
n-Nitrosodimethylamine	0	0	0	17,000	17,000	34,915	
n-Nitrosodi-n-Propylamine	0	0	0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0	0	300	300	616	
Phenanthrene	0	0	0	5	5.0	10.3	
Pyrene	0	0	0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0	0	130	130	267	

CFC CCT (min): ##### PMF: 1 Analysis Hardness (mg/l): 96.189 Analysis pH: 7.41

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
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Total Dissolved Solids (PWS)	104000	0	0	N/A	N/A	N/A	
Chloride (PWS)	9470	0	0	N/A	N/A	N/A	
Sulfate (PWS)	8780	0	0	N/A	N/A	N/A	
Total Aluminum	0	0	0	N/A	N/A	N/A	
Total Antimony	0	0	0	220	220	901	
Total Arsenic	0	0	0	150	150	615	Chem Translator of 1 applied
Total Barium	0	0	0	4,100	4,100	16,798	
Total Boron	0	0	0	1,600	1,600	6,555	
Total Cadmium	0	0	0	0.239	0.26	1.08	Chem Translator of 0.911 applied
Total Chromium (III)	0	0	0	71.793	83.5	342	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0	0	10	10.4	42.6	Chem Translator of 0.962 applied
Total Cobalt	0	0	0	19	19.0	77.8	
Total Copper	0	0	0	8.663	9.02	37.0	Chem Translator of 0.96 applied
Free Cyanide	0	0	0	5.2	5.2	21.3	
Dissolved Iron	0	0	0	N/A	N/A	N/A	
Total Iron	0	0	0	1,500	1,500	6,146	WQC = 30 day average; PMF = 1
Total Lead	0	0	0	2.412	3.03	12.4	Chem Translator of 0.797 applied
Total Manganese	0	0	0	N/A	N/A	N/A	
Total Mercury	0	0	0	0.770	0.91	3.71	Chem Translator of 0.85 applied
Total Nickel	0	0	0	50.325	50.5	207	Chem Translator of 0.997 applied
Total Phenols (Phenolics) (PWS)	0	0	0	N/A	N/A	N/A	
Total Selenium	0	0	0	4.600	4.99	20.4	Chem Translator of 0.922 applied
Total Silver	0	0	0	N/A	N/A	N/A	Chem Translator of 1 applied
Total Thallium	0	0	0	13	13.0	53.3	
Total Zinc	0	0	0	114.313	116	475	Chem Translator of 0.986 applied
Acrolein	0	0	0	3	3.0	12.3	
Acrylonitrile	0	0	0	130	130	533	
Benzene	0	0	0	130	130	533	
Bromoform	0	0	0	370	370	1,516	
Carbon Tetrachloride	0	0	0	560	560	2,294	
Chlorobenzene	0	0	0	240	240	983	
Chlorodibromomethane	0	0	0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0	0	3,500	3,500	14,340	
Chloroform	0	0	0	390	390	1,598	
Dichlorobromomethane	0	0	0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0	0	3,100	3,100	12,701	
1,1-Dichloroethylene	0	0	0	1,500	1,500	6,146	
1,2-Dichloropropane	0	0	0	2,200	2,200	9,014	
1,3-Dichloropropylene	0	0	0	61	61.0	250	
Ethylbenzene	0	0	0	580	580	2,376	
Methyl Bromide	0	0	0	110	110	451	
Methyl Chloride	0	0	0	5,500	5,500	22,534	
Methylene Chloride	0	0	0	2,400	2,400	9,833	
1,1,2,2-Tetrachloroethane	0	0	0	210	210	860	
Tetrachloroethylene	0	0	0	140	140	574	

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Toluene	0	0	0	330	330	1,352
1,2-trans-Dichloroethylene	0	0	0	1,400	1,400	5,736
1,1,1-Trichloroethane	0	0	0	610	610	2,499
1,1,2-Trichloroethane	0	0	0	680	680	2,786
Trichloroethylene	0	0	0	450	450	1,844
Vinyl Chloride	0	0	0	N/A	N/A	N/A
2-Chlorophenol	0	0	0	110	110	451
2,4-Dichlorophenol	0	0	0	340	340	1,393
2,4-Dimethylphenol	0	0	0	130	130	533
4,6-Dinitro-o-Cresol	0	0	0	16	16.0	65.6
2,4-Dinitrophenol	0	0	0	130	130	533
2-Nitrophenol	0	0	0	1,600	1,600	6,555
4-Nitrophenol	0	0	0	470	470	1,926
p-Chloro-m-Cresol	0	0	0	500	500	2,049
Pentachlorophenol	0	0	0	8.445	8.44	34.6
Phenol	0	0	0	N/A	N/A	N/A
2,4,6-Trichlorophenol	0	0	0	91	91.0	373
Acenaphthene	0	0	0	17	17.0	69.7
Anthracene	0	0	0	N/A	N/A	N/A
Benzidine	0	0	0	59	59.0	242
Benzo(a)Anthracene	0	0	0	0.1	0.1	0.41
Benzo(a)Pyrene	0	0	0	N/A	N/A	N/A
3,4-Benzofluoranthene	0	0	0	N/A	N/A	N/A
Benzo(k)Fluoranthene	0	0	0	N/A	N/A	N/A
Bis(2-Chloroethyl)Ether	0	0	0	6,000	6,000	24,582
Bis(2-Chloroisopropyl)Ether	0	0	0	N/A	N/A	N/A
Bis(2-Ethylhexyl)Phthalate	0	0	0	910	910	3,728
4-Bromophenyl Phenyl Ether	0	0	0	54	54.0	221
Butyl Benzyl Phthalate	0	0	0	35	35.0	143
2-Chloronaphthalene	0	0	0	N/A	N/A	N/A
Chrysene	0	0	0	N/A	N/A	N/A
Dibenzo(a,h)Anthracene	0	0	0	N/A	N/A	N/A
1,2-Dichlorobenzene	0	0	0	160	160	656
1,3-Dichlorobenzene	0	0	0	69	69.0	283
1,4-Dichlorobenzene	0	0	0	150	150	615
3,3-Dichlorobenzidine	0	0	0	N/A	N/A	N/A
Diethyl Phthalate	0	0	0	800	800	3,278
Dimethyl Phthalate	0	0	0	500	500	2,049
Di-n-Butyl Phthalate	0	0	0	21	21.0	86.0
2,4-Dinitrotoluene	0	0	0	320	320	1,311
2,6-Dinitrotoluene	0	0	0	200	200	819
1,2-Diphenylhydrazine	0	0	0	3	3.0	12.3
Fluoranthene	0	0	0	40	40.0	164
Fluorene	0	0	0	N/A	N/A	N/A
Hexachlorobenzene	0	0	0	N/A	N/A	N/A

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Hexachlorobutadiene	0	0	0	2	2.0	8.19
Hexachlorocyclopentadiene	0	0	0	1	1.0	4.1
Indeno(1,2,3-cd)Pyrene	0	0	0	N/A	N/A	N/A
Isophorone	0	0	0	2,100	2,100	8,604
Naphthalene	0	0	0	43	43.0	176
Nitrobenzene	0	0	0	810	810	3,319
n-Nitrosodimethylamine	0	0	0	3,400	3,400	13,930
n-Nitrosodi-n-Propylamine	0	0	0	N/A	N/A	N/A
n-Nitrosodiphenylamine	0	0	0	59	59.0	242
Phenanthrene	0	0	0	1	1.0	4.1
Pyrene	0	0	0	N/A	N/A	N/A
1,2,4-Trichlorobenzene	0	0	0	26	26.0	107

THH CCT (min): ##### THH PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A PWS PMF: 1

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	104000	0	0	0	500,000	500,000	7,381,326	WQC applied at RMI 57 with a design stream flow of 45.7 cfs
Chloride (PWS)	9470	0	0	0	250,000	250,000	4,429,711	WQC applied at RMI 57 with a design stream flow of 45.7 cfs
Sulfate (PWS)	8780	0	0	0	250,000	250,000	4,441,701	WQC applied at RMI 57 with a design stream flow of 45.7 cfs
Total Aluminum	0	0	0	0	N/A	N/A	N/A	
Total Antimony	0	0	0	0	5.6	5.6	22.9	
Total Arsenic	0	0	0	0	10	10.0	41.0	
Total Barium	0	0	0	0	2,400	2,400	9,833	
Total Boron	0	0	0	0	3,100	3,100	12,701	
Total Cadmium	0	0	0	0	N/A	N/A	N/A	
Total Chromium (III)	0	0	0	0	N/A	N/A	N/A	
Hexavalent Chromium	0	0	0	0	N/A	N/A	N/A	
Total Cobalt	0	0	0	0	N/A	N/A	N/A	
Total Copper	0	0	0	0	N/A	N/A	N/A	
Free Cyanide	0	0	0	0	4	4.0	16.4	
Dissolved Iron	0	0	0	0	300	300	1,229	
Total Iron	0	0	0	0	N/A	N/A	N/A	
Total Lead	0	0	0	0	N/A	N/A	N/A	
Total Manganese	0	0	0	0	1,000	1,000	4,097	
Total Mercury	0	0	0	0	0.050	0.05	0.2	
Total Nickel	0	0	0	0	610	610	2,499	
Total Phenols (Phenolics) (PWS)	0	0	0	0	5	5.0	91.9	WQC applied at RMI 57 with a design stream flow of 45.7 cfs
Total Selenium	0	0	0	0	N/A	N/A	N/A	
Total Silver	0	0	0	0	N/A	N/A	N/A	
Total Thallium	0	0	0	0	0.24	0.24	0.98	
Total Zinc	0	0	0	0	N/A	N/A	N/A	
Acrolein	0	0	0	0	3	3.0	12.3	
Acrylonitrile	0	0	0	0	N/A	N/A	N/A	
Benzene	0	0	0	0	N/A	N/A	N/A	

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Bromoform	0	0		0	N/A	N/A	N/A
Carbon Tetrachloride	0	0		0	N/A	N/A	N/A
Chlorobenzene	0	0		0	100	100.0	410
Chlorodibromomethane	0	0		0	N/A	N/A	N/A
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A
Chloroform	0	0		0	N/A	N/A	N/A
Dichlorobromomethane	0	0		0	N/A	N/A	N/A
1,2-Dichloroethane	0	0		0	N/A	N/A	N/A
1,1-Dichloroethylene	0	0		0	33	33.0	135
1,2-Dichloropropane	0	0		0	N/A	N/A	N/A
1,3-Dichloropropylene	0	0		0	N/A	N/A	N/A
Ethylbenzene	0	0		0	68	68.0	279
Methyl Bromide	0	0		0	100	100.0	410
Methyl Chloride	0	0		0	N/A	N/A	N/A
Methylene Chloride	0	0		0	N/A	N/A	N/A
1,1,2,2-Tetrachloroethane	0	0		0	N/A	N/A	N/A
Tetrachloroethylene	0	0		0	N/A	N/A	N/A
Toluene	0	0		0	57	57.0	234
1,2-trans-Dichloroethylene	0	0		0	100	100.0	410
1,1,1-Trichloroethane	0	0		0	10,000	10,000	40,971
1,1,2-Trichloroethane	0	0		0	N/A	N/A	N/A
Trichloroethylene	0	0		0	N/A	N/A	N/A
Vinyl Chloride	0	0		0	N/A	N/A	N/A
2-Chlorophenol	0	0		0	30	30.0	123
2,4-Dichlorophenol	0	0		0	10	10.0	41.0
2,4-Dimethylphenol	0	0		0	100	100.0	410
4,6-Dinitro-o-Cresol	0	0		0	2	2.0	8.19
2,4-Dinitrophenol	0	0		0	10	10.0	41.0
2-Nitrophenol	0	0		0	N/A	N/A	N/A
4-Nitrophenol	0	0		0	N/A	N/A	N/A
p-Chloro-m-Cresol	0	0		0	N/A	N/A	N/A
Pentachlorophenol	0	0		0	N/A	N/A	N/A
Phenol	0	0		0	4,000	4,000	16,388
2,4,6-Trichlorophenol	0	0		0	N/A	N/A	N/A
Acenaphthene	0	0		0	70	70.0	287
Anthracene	0	0		0	300	300	1,229
Benzidine	0	0		0	N/A	N/A	N/A
Benzo(a)Anthracene	0	0		0	N/A	N/A	N/A
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A
Bis(2-Chloroethyl)Ether	0	0		0	N/A	N/A	N/A
Bis(2-Chloroisopropyl)Ether	0	0		0	200	200	819
Bis(2-Ethylhexyl)Phthalate	0	0		0	N/A	N/A	N/A
4-Bromophenyl Phenyl Ether	0	0		0	N/A	N/A	N/A

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Butyl Benzyl Phthalate	0	0		0	0.1	0.1	0.41	
2-Chloronaphthalene	0	0		0	800	800	3,278	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthracene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	1,000	1,000	4,097	
1,3-Dichlorobenzene	0	0		0	7	7.0	28.7	
1,4-Dichlorobenzene	0	0		0	300	300	1,229	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	600	600	2,458	
Dimethyl Phthalate	0	0		0	2,000	2,000	8,194	
Di-n-Butyl Phthalate	0	0		0	20	20.0	81.9	
2,4-Dinitrotoluene	0	0		0	N/A	N/A	N/A	
2,6-Dinitrotoluene	0	0		0	N/A	N/A	N/A	
1,2-Diphenylhydrazine	0	0		0	N/A	N/A	N/A	
Fluoranthene	0	0		0	20	20.0	81.9	
Fluorene	0	0		0	50	50.0	205	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	N/A	N/A	N/A	
Hexachlorocyclopentadiene	0	0		0	4	4.0	16.4	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	34	34.0	139	
Naphthalene	0	0		0	N/A	N/A	N/A	
Nitrobenzene	0	0		0	10	10.0	41.0	
n-Nitrosodimethylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	N/A	N/A	N/A	
Phenanthrene	0	0		0	N/A	N/A	N/A	
Pyrene	0	0		0	20	20.0	81.9	
1,2,4-Trichlorobenzene	0	0		0	0.07	0.07	0.29	

CRL CCT (min): PMF: Analysis Hardness (mg/l): Analysis pH:

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	104000	0		0	N/A	N/A	N/A	
Chloride (PWS)	9470	0		0	N/A	N/A	N/A	
Sulfate (PWS)	8780	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	N/A	N/A	N/A	
Total Arsenic	0	0		0	N/A	N/A	N/A	
Total Barium	0	0		0	N/A	N/A	N/A	
Total Boron	0	0		0	N/A	N/A	N/A	
Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	

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Total Cobalt	0	0		0	N/A	N/A	N/A
Total Copper	0	0		0	N/A	N/A	N/A
Free Cyanide	0	0		0	N/A	N/A	N/A
Dissolved Iron	0	0		0	N/A	N/A	N/A
Total Iron	0	0		0	N/A	N/A	N/A
Total Lead	0	0		0	N/A	N/A	N/A
Total Manganese	0	0		0	N/A	N/A	N/A
Total Mercury	0	0		0	N/A	N/A	N/A
Total Nickel	0	0		0	N/A	N/A	N/A
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A
Total Selenium	0	0		0	N/A	N/A	N/A
Total Silver	0	0		0	N/A	N/A	N/A
Total Thallium	0	0		0	N/A	N/A	N/A
Total Zinc	0	0		0	N/A	N/A	N/A
Acrolein	0	0		0	N/A	N/A	N/A
Acrylonitrile	0	0		0	0.06	0.06	1.12
Benzene	0	0		0	0.58	0.58	10.8
Bromoform	0	0		0	7	7.0	131
Carbon Tetrachloride	0	0		0	0.4	0.4	7.47
Chlorobenzene	0	0		0	N/A	N/A	N/A
Chlorodibromomethane	0	0		0	0.8	0.8	14.9
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A
Chloroform	0	0		0	5.7	5.7	106
Dichlorobromomethane	0	0		0	0.95	0.95	17.7
1,2-Dichloroethane	0	0		0	9.9	9.9	185
1,1-Dichloroethylene	0	0		0	N/A	N/A	N/A
1,2-Dichloropropane	0	0		0	0.9	0.9	16.8
1,3-Dichloropropylene	0	0		0	0.27	0.27	5.04
Ethylbenzene	0	0		0	N/A	N/A	N/A
Methyl Bromide	0	0		0	N/A	N/A	N/A
Methyl Chloride	0	0		0	N/A	N/A	N/A
Methylene Chloride	0	0		0	20	20.0	373
1,1,2,2-Tetrachloroethane	0	0		0	0.2	0.2	3.73
Tetrachloroethylene	0	0		0	10	10.0	187
Toluene	0	0		0	N/A	N/A	N/A
1,2-trans-Dichloroethylene	0	0		0	N/A	N/A	N/A
1,1,1-Trichloroethane	0	0		0	N/A	N/A	N/A
1,1,2-Trichloroethane	0	0		0	0.55	0.55	10.3
Trichloroethylene	0	0		0	0.6	0.6	11.2
Vinyl Chloride	0	0		0	0.02	0.02	0.37
2-Chlorophenol	0	0		0	N/A	N/A	N/A
2,4-Dichlorophenol	0	0		0	N/A	N/A	N/A
2,4-Dimethylphenol	0	0		0	N/A	N/A	N/A
4,6-Dinitro-o-Cresol	0	0		0	N/A	N/A	N/A
2,4-Dinitrophenol	0	0		0	N/A	N/A	N/A

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2-Nitrophenol	0	0	0	N/A	N/A	N/A
4-Nitrophenol	0	0	0	N/A	N/A	N/A
p-Chloro-m-Cresol	0	0	0	N/A	N/A	N/A
Pentachlorophenol	0	0	0	0.030	0.03	0.56
Phenol	0	0	0	N/A	N/A	N/A
2,4,6-Trichlorophenol	0	0	0	1.5	1.5	28.0
Acenaphthene	0	0	0	N/A	N/A	N/A
Anthracene	0	0	0	N/A	N/A	N/A
Benzidine	0	0	0	0.0001	0.0001	0.002
Benzo(a)Anthracene	0	0	0	0.001	0.001	0.019
Benzo(a)Pyrene	0	0	0	0.0001	0.0001	0.002
3,4-Benzofluoranthene	0	0	0	0.001	0.001	0.019
Benzo(k)Fluoranthene	0	0	0	0.01	0.01	0.19
Bis(2-Chloroethyl)Ether	0	0	0	0.03	0.03	0.56
Bis(2-Chloroisopropyl)Ether	0	0	0	N/A	N/A	N/A
Bis(2-Ethylhexyl)Phthalate	0	0	0	0.32	0.32	5.97
4-Bromophenyl Phenyl Ether	0	0	0	N/A	N/A	N/A
Butyl Benzyl Phthalate	0	0	0	N/A	N/A	N/A
2-Chloronaphthalene	0	0	0	N/A	N/A	N/A
Chrysene	0	0	0	0.12	0.12	2.24
Dibenzo(a,h)Anthracene	0	0	0	0.0001	0.0001	0.002
1,2-Dichlorobenzene	0	0	0	N/A	N/A	N/A
1,3-Dichlorobenzene	0	0	0	N/A	N/A	N/A
1,4-Dichlorobenzene	0	0	0	N/A	N/A	N/A
3,3-Dichlorobenzidine	0	0	0	0.05	0.05	0.93
Diethyl Phthalate	0	0	0	N/A	N/A	N/A
Dimethyl Phthalate	0	0	0	N/A	N/A	N/A
Di-n-Butyl Phthalate	0	0	0	N/A	N/A	N/A
2,4-Dinitrotoluene	0	0	0	0.05	0.05	0.93
2,6-Dinitrotoluene	0	0	0	0.05	0.05	0.93
1,2-Diphenylhydrazine	0	0	0	0.03	0.03	0.56
Fluoranthene	0	0	0	N/A	N/A	N/A
Fluorene	0	0	0	N/A	N/A	N/A
Hexachlorobenzene	0	0	0	0.00008	0.00008	0.001
Hexachlorobutadiene	0	0	0	0.01	0.01	0.19
Hexachlorocyclopentadiene	0	0	0	N/A	N/A	N/A
Indeno(1,2,3-cd)Pyrene	0	0	0	0.001	0.001	0.019
Isophorone	0	0	0	N/A	N/A	N/A
Naphthalene	0	0	0	N/A	N/A	N/A
Nitrobenzene	0	0	0	N/A	N/A	N/A
n-Nitrosodimethylamine	0	0	0	0.0007	0.0007	0.013
n-Nitrosodi-n-Propylamine	0	0	0	0.005	0.005	0.093
n-Nitrosodiphenylamine	0	0	0	3.3	3.3	61.6
Phenanthrene	0	0	0	N/A	N/A	N/A
Pyrene	0	0	0	N/A	N/A	N/A

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1,2,4-Trichlorobenzene	0	0		0	N/A	N/A	N/A
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Recommended WQBELs & Monitoring Requirements

No. Samples/Month: 4

Pollutants	Mass Limits		Concentration Limits				Governing WQBEL	WQBEL Basis	Comments
	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units			
Total Aluminum	Report	Report	Report	Report	Report	µg/L	987	AFC	Discharge Conc > 10% WQBEL (no RP)
Total Copper	0.32	0.49	22.3	34.7	55.7	µg/L	22.3	AFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Zinc	Report	Report	Report	Report	Report	µg/L	187	AFC	Discharge Conc > 10% WQBEL (no RP)
Benzo(a)Anthracene	0.0003	0.0004	0.019	0.029	0.047	µg/L	0.019	CRL	Discharge Conc ≥ 50% WQBEL (RP)
Benzo(a)Pyrene	0.00003	0.00004	0.002	0.003	0.005	µg/L	0.002	CRL	Discharge Conc ≥ 50% WQBEL (RP)
Benzo(k)Fluoranthene	0.003	0.004	0.19	0.29	0.47	µg/L	0.19	CRL	Discharge Conc ≥ 50% WQBEL (RP)
Bis(2-Ethylhexyl)Phthalate	Report	Report	Report	Report	Report	µg/L	5.97	CRL	Discharge Conc > 25% WQBEL (no RP)

Other Pollutants without Limits or Monitoring

The following pollutants do not require effluent limits or monitoring based on water quality because reasonable potential to exceed water quality criteria was not determined and the discharge concentration was less than thresholds for monitoring, or the pollutant was not detected and a sufficiently sensitive analytical method was used (e.g., <= Target QL).

Pollutants	Governing WQBEL	Units	Comments
Total Dissolved Solids (PWS)	7,381	mg/L	Discharge Conc ≤ 10% WQBEL
Chloride (PWS)	4,430	mg/L	Discharge Conc ≤ 10% WQBEL
Bromide	N/A	N/A	No WQS
Sulfate (PWS)	4,442	mg/L	Discharge Conc ≤ 10% WQBEL
Total Antimony	22.9	µg/L	Discharge Conc ≤ 10% WQBEL
Total Arsenic	41.0	µg/L	Discharge Conc ≤ 10% WQBEL
Total Barium	9,833	µg/L	Discharge Conc ≤ 10% WQBEL
Total Beryllium	N/A	N/A	No WQS
Total Boron	6,555	µg/L	Discharge Conc < TQL
Total Cadmium	1.08	µg/L	Discharge Conc < TQL
Total Chromium (III)	342	µg/L	Discharge Conc ≤ 10% WQBEL
Hexavalent Chromium	21.4	µg/L	Discharge Conc < TQL
Total Cobalt	77.8	µg/L	Discharge Conc ≤ 10% WQBEL
Free Cyanide	16.4	µg/L	Discharge Conc ≤ 25% WQBEL
Total Cyanide	N/A	N/A	No WQS
Dissolved Iron	1,229	µg/L	Discharge Conc < TQL
Total Iron	6,146	µg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	12.4	µg/L	Discharge Conc ≤ 10% WQBEL
Total Manganese	4,097	µg/L	Discharge Conc ≤ 10% WQBEL

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Total Mercury	0.2	µg/L	Discharge Conc < TQL
Total Nickel	207	µg/L	Discharge Conc ≤ 10% WQBEL
Total Phenols (Phenolics) (PWS)	91.9	µg/L	Discharge Conc < TQL
Total Selenium	20.4	µg/L	Discharge Conc < TQL
Total Silver	7.04	µg/L	Discharge Conc < TQL
Total Thallium	0.98	µg/L	Discharge Conc < TQL
Total Molybdenum	N/A	N/A	No WQS
Acrolein	3.95	µg/L	Discharge Conc < TQL
Acrylonitrile	1.12	µg/L	Discharge Conc < TQL
Benzene	10.8	µg/L	Discharge Conc < TQL
Bromoform	131	µg/L	Discharge Conc < TQL
Carbon Tetrachloride	7.47	µg/L	Discharge Conc < TQL
Chlorobenzene	410	µg/L	Discharge Conc ≤ 25% WQBEL
Chlorodibromomethane	14.9	µg/L	Discharge Conc < TQL
Chloroethane	N/A	N/A	No WQS
2-Chloroethyl Vinyl Ether	14,340	µg/L	Discharge Conc < TQL
Chloroform	106	µg/L	Discharge Conc ≤ 25% WQBEL
Dichlorobromomethane	17.7	µg/L	Discharge Conc < TQL
1,1-Dichloroethane	N/A	N/A	No WQS
1,2-Dichloroethane	185	µg/L	Discharge Conc < TQL
1,1-Dichloroethylene	135	µg/L	Discharge Conc < TQL
1,2-Dichloropropane	16.8	µg/L	Discharge Conc < TQL
1,3-Dichloropropylene	5.04	µg/L	Discharge Conc < TQL
1,4-Dioxane	N/A	N/A	No WQS
Ethylbenzene	279	µg/L	Discharge Conc < TQL
Methyl Bromide	410	µg/L	Discharge Conc < TQL
Methyl Chloride	22,534	µg/L	Discharge Conc < TQL
Methylene Chloride	373	µg/L	Discharge Conc < TQL
1,1,2,2-Tetrachloroethane	3.73	µg/L	Discharge Conc < TQL
Tetrachloroethylene	187	µg/L	Discharge Conc < TQL
Toluene	234	µg/L	Discharge Conc < TQL
1,2-trans-Dichloroethylene	410	µg/L	Discharge Conc < TQL
1,1,1-Trichloroethane	2,499	µg/L	Discharge Conc < TQL
1,1,2-Trichloroethane	10.3	µg/L	Discharge Conc < TQL
Trichloroethylene	11.2	µg/L	Discharge Conc < TQL
Vinyl Chloride	0.37	µg/L	Discharge Conc < TQL
2-Chlorophenol	123	µg/L	Discharge Conc < TQL
2,4-Dichlorophenol	41.0	µg/L	Discharge Conc < TQL
2,4-Dimethylphenol	410	µg/L	Discharge Conc < TQL
4,6-Dinitro-o-Cresol	8.19	µg/L	Discharge Conc < TQL
2,4-Dinitrophenol	41.0	µg/L	Discharge Conc < TQL
2-Nitrophenol	6,555	µg/L	Discharge Conc < TQL
4-Nitrophenol	1,926	µg/L	Discharge Conc < TQL
p-Chloro-m-Cresol	211	µg/L	Discharge Conc < TQL
Pentachlorophenol	0.56	µg/L	Discharge Conc < TQL

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Phenol	16,388	µg/L	Discharge Conc < TQL
2,4,6-Trichlorophenol	28.0	µg/L	Discharge Conc < TQL
Acenaphthene	69.7	µg/L	Discharge Conc < TQL
Acenaphthylene	N/A	N/A	No WQS
Anthracene	1,229	µg/L	Discharge Conc < TQL
Benzidine	0.002	µg/L	Discharge Conc < TQL
3,4-Benzofluoranthene	0.019	µg/L	Discharge Conc < TQL
Benzo(ghi)Perylene	N/A	N/A	No WQS
Bis(2-Chloroethoxy)Methane	N/A	N/A	No WQS
Bis(2-Chloroethyl)Ether	0.56	µg/L	Discharge Conc < TQL
Bis(2-Chloroisopropyl)Ether	819	µg/L	Discharge Conc < TQL
4-Bromophenyl Phenyl Ether	221	µg/L	Discharge Conc < TQL
Butyl Benzyl Phthalate	0.41	µg/L	Discharge Conc < TQL
2-Chloronaphthalene	3,278	µg/L	Discharge Conc < TQL
4-Chlorophenyl Phenyl Ether	N/A	N/A	No WQS
Chrysene	2.24	µg/L	Discharge Conc < TQL
Dibenzo(a,h)Anthracene	0.002	µg/L	Discharge Conc < TQL
1,2-Dichlorobenzene	656	µg/L	Discharge Conc < TQL
1,3-Dichlorobenzene	28.7	µg/L	Discharge Conc < TQL
1,4-Dichlorobenzene	615	µg/L	Discharge Conc < TQL
3,3-Dichlorobenzidine	0.93	µg/L	Discharge Conc < TQL
Diethyl Phthalate	2,458	µg/L	Discharge Conc < TQL
Dimethyl Phthalate	2,049	µg/L	Discharge Conc < TQL
Di-n-Butyl Phthalate	81.9	µg/L	Discharge Conc ≤ 25% WQBEL
2,4-Dinitrotoluene	0.93	µg/L	Discharge Conc < TQL
2,6-Dinitrotoluene	0.93	µg/L	Discharge Conc < TQL
Di-n-Octyl Phthalate	N/A	N/A	No WQS
1,2-Diphenylhydrazine	0.56	µg/L	Discharge Conc < TQL
Fluoranthene	81.9	µg/L	Discharge Conc < TQL
Fluorene	205	µg/L	Discharge Conc < TQL
Hexachlorobenzene	0.001	µg/L	Discharge Conc < TQL
Hexachlorobutadiene	0.19	µg/L	Discharge Conc < TQL
Hexachlorocyclopentadiene	4.1	µg/L	Discharge Conc < TQL
Indeno(1,2,3-cd)Pyrene	0.019	µg/L	Discharge Conc < TQL
Isophorone	139	µg/L	Discharge Conc < TQL
Naphthalene	176	µg/L	Discharge Conc < TQL
Nitrobenzene	41.0	µg/L	Discharge Conc < TQL
n-Nitrosodimethylamine	0.013	µg/L	Discharge Conc < TQL
n-Nitrosodi-n-Propylamine	0.093	µg/L	Discharge Conc < TQL
n-Nitrosodiphenylamine	61.6	µg/L	Discharge Conc < TQL
Phenanthrene	4.1	µg/L	Discharge Conc < TQL
Pyrene	81.9	µg/L	Discharge Conc < TQL
1,2,4-Trichlorobenzene	0.29	µg/L	Discharge Conc < TQL

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North & South Shenango Joint STP

1A	B	C	D	E	F	G
2	TRC EVALUATION		North & South Shenango Joint STP			
3	Input appropriate values in B4:B8 and E4:E7					
4	8.145	= Q stream (cfs)		0.5	= CV Daily	
5	1.7	= Q discharge (MGD)		0.5	= CV Hourly	
6	30	= no. samples		0.34	= 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 = 0.355		1.3.2.iii	WLA_cfc = 0.974
12	PENTOXSD TRG	5.1a	LTAMULT_afc = 0.373		5.1c	LTAMULT_cfc = 0.581
13	PENTOXSD TRG	5.1b	LTA_afc = 0.132		5.1d	LTA_cfc = 0.566
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) = 0.163		AFC	
18			INST_MAX_LIMIT (mg/l) = 0.532			
	WLA_afc	$(.019/e^{-k \cdot AFC_tc}) + [(AFC_Yc \cdot Qs \cdot 0.019 / Qd \cdot e^{-k \cdot AFC_tc}) \dots + Xd + (AFC_Yc \cdot Qs \cdot Xs / Qd)] \cdot (1 - FOS / 100)$				
	LTAMULT_afc	$EXP((0.5 \cdot LN(cvh^2 + 1)) - 2.326 \cdot LN(cvh^2 + 1)^{0.5})$				
	LTA_afc	wla_afc * LTAMULT_afc				
	WLA_cfc	$(.011/e^{-k \cdot CFC_tc}) + [(CFC_Yc \cdot Qs \cdot 0.011 / Qd \cdot e^{-k \cdot CFC_tc}) \dots + Xd + (CFC_Yc \cdot Qs \cdot Xs / Qd)] \cdot (1 - FOS / 100)$				
	LTAMULT_cfc	$EXP((0.5 \cdot LN(cvd^2 / no_samples + 1)) - 2.326 \cdot LN(cvd^2 / no_samples + 1)^{0.5})$				
	LTA_cfc	wla_cfc * LTAMULT_cfc				
	AML_MULT	$EXP(2.326 \cdot LN((cvd^2 / no_samples + 1)^{0.5}) - 0.5 \cdot LN(cvd^2 / no_samples + 1))$				
	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)				

NPDES Permit Fact Sheet

NPDES Permit No. PA0100277
North & South Shenango Joint STP

2/8/2022

Outfall 001

Facility:	North & South Shenango Joint STP		
Permit Number:	PA0100277	Effective: Pending	Expiration:
Outfall No:	001		
Location:	Jamestown, PA		
Discharge to:	Shenango River		
Site Specific Mussel Survey Completed:	None		
Discharge and Stream Characteristics		Comments	
Q _s	Stream Flow	7 MGD / 11.21 cfs	USGS # 03101500, accrued flow #03100000
Q _D	Discharge Flow	1.7 MGD / 2.63067 cfs	Design discharge flow of the plant
C _{E(Cl)}	Instream chloride Concentration	9.47 mg/L	WQN 911 field samples (2010-2020)(June-Sept)
C _{E(Cl)}	Discharge chloride (existing)	35.2 mg/L	Maximum concentration from renewal application
C _{P(Cl)}	Discharge chloride (proposed)	35.2 mg/L	Maximum concentration from renewal application
C _{E(Ni)}	Instream nickel Concentration	1 µg/L	Unknow - All data found was non-detect (< 50 ug/l)
C _{E(Ni)}	Discharge nickel (existing)	1 µg/L	Maximum concentration from renewal application
C _{P(Ni)}	Discharge nickel (proposed)	1 µg/L	Maximum concentration from renewal application
C _{E(Zn)}	Instream zinc Concentration	10 µg/L	Assumed - Greenville STP Mussel Survey (2017) reported background as <10
C _{E(Zn)}	Discharge zinc (existing)	30 µg/L	Maximum concentration from renewal application
Z _{D(Zn)}	Discharge zinc (proposed)	30 µg/L	Maximum concentration from renewal application
C _{E(NH3-N)}	Instream NH ³ -N	0.11 mg/L	WQN 911 field samples (2002-2011)
C _{E(NH3-N)}	Discharge NH ³ -N (existing)	0.94 mg/L	Highest average monthly concentration reported on DMRs in last 5 years
C _{P(NH3-N)}	Discharge NH ³ -N (proposed)	0.94 mg/L	Highest average monthly concentration reported on DMRs in last 5 years
pH _s	Instream pH	7.71 S.U.	WQN 911 field samples (2010-2020)(June-Sept)
T _s	Instream Temp.	20.24 °C	WQN 911 (2005-2020)(Summer time)
C _{E(NH3-N)}	Ammonia criteria	1.113 mg/L	From ammonia criteria comparison spreadsheet -using Instream pH and Temp
C _{E(Cl)}	Chloride criteria	78 mg/L	USFWS criteria
C _{E(Ni)}	Nickel criteria	7.3 µg/L	USFWS criteria
C _{E(Zn)}	Zinc criteria	13.18 µg/L	USFWS criteria
W _s	Stream width	17.87 meters	TMS Spreadsheet estimation

Ammonia Criteria Calculations:			
pH _s	7.71	S.U.	(Default value is 7.0)
T _s	20.24	°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) =	4.231		
EPA 2013 CMC (mg TAN/L) =	6.463	Oncorhynchus present	* formula on pg. 41 (plateaus at 15.7 C)
	6.463	Oncorhynchus absent	* formula on pg. 42 (plateaus at 10.2 C)
Chronic Criteria			
METHOD and UNITS	CRITERIA	COMMENTS	
Old CMC (mg TAN/L) =	1.231		
C _{C(NH3-N)} EPA 2013 CMC (mg TAN/L) =	1.113	* 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 (<i>Quadrula cylindrica</i>)		per m ²
Northern Riffleshell (<i>Epioblasma torulosa rangiana</i>)		per m ²
Rayed Bean (<i>Villosa fabalis</i>)		per m ²
Clubshell (<i>Pleurobema clava</i>)		per m ²
Sheepnose (<i>Plethobasus cyphus</i>)		per m ²
Snuffbox (<i>Epioblasma triquetra</i>)		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. Chloride in Existing Discharge:	35	mg/L
C. Chloride in Proposed Discharge after Treatment Facility Upgrades:	35.2	mg/L
D. Approximate Area of Impact after Treatment Facility Upgrades:	N/A	m ²

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

NPDES Permit Fact Sheet

NPDES Permit No. PA0100277
North & South Shenango Joint STP

2/8/2022

Outfall 001

Facility:	North & South Shenango Joint STP		
Permit Number:	PA0100277	Effective: Pending	Expiration:
Outfall No:	001		
Location:	Jamestown, PA		
Discharge to:	Shenango River		
Site Specific Mussel Survey Completed:	None		

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

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

Parameter	Calculation	Value
Chloride (Cl ⁻)	$L_{S(Cl)} = \text{Available Chloride Loading in Stream} = C_{S(Cl)} - C_{R(Cl)} \times Q_d(\text{MGD}) \times 8.34 =$	4,001 lbs/Day
	$L_{D-MAX(Cl)} = \text{Current Maximum Discharge Chloride Loading exceeding criteria} = (C_{E(Cl)} - C_{R(Cl)}) \times Q_d(\text{MGD}) \times 8.34 =$	-607 lbs/Day
	$\%P_{E(Cl)} = \text{Percent of Stream Capacity for Current Loading} = L_{D-MAX(Cl)} / L_{S(Cl)} =$	0% of Stream Capacity
	$L_{D(P)} = \text{Proposed Discharge Cl}^- \text{ Loading exceeding criteria after Treatment Facility Upgrades} = (C_{P(Cl)} - C_{R(Cl)}) \times Q_d(\text{MGD}) \times 8.34 =$	-606.8184 lbs/Day
	$\%P_{P(Cl)} = \text{Percent of Stream Capacity for Proposed Loading} = L_{D(P)} / L_{S(Cl)} =$	-15.17% of Stream Capacity
Proposed Area of Impact due to Chloride * = $(\%P_{P(Cl)} \times W_3)^2 \times 0.5 =$ * assuming equal flow across transect and 90° spread at discharge		3.67 m ²
Nickel (Ni)	$L_{S(Ni)} = \text{Available Nickel Loading in Stream} = C_{S(Ni)} - C_{R(Ni)} \times Q_d(\text{MGD}) \times 8.34 =$	368 lbs/Day
	$L_{D-MAX(Ni)} = \text{Current Maximum Discharge Nickel Loading exceeding criteria} = (C_{E(Ni)} - C_{R(Ni)}) \times Q_d(\text{MGD}) \times 8.34 =$	-89 lbs/Day
	$\%P_{E(Ni)} = \text{Percent of Stream Capacity for Current Loading} = L_{D-MAX(Ni)} / L_{S(Ni)} =$	0% of Stream Capacity
	$L_{D(P)} = \text{Proposed Discharge Ni Loading exceeding criteria after Treatment Facility Upgrades} = (C_{P(Ni)} - C_{R(Ni)}) \times Q_d(\text{MGD}) \times 8.34 =$	-89.3214 lbs/Day
	$\%P_{P(Ni)} = \text{Percent of Stream Capacity for Proposed Loading} = L_{D(P)} / L_{S(Ni)} =$	-24.27% of Stream Capacity
Proposed Area of Impact due to Nickel * = $(\%P_{P(Ni)} \times W_3)^2 \times 0.5 =$ * assuming equal flow across transect and 90° spread at discharge		9.41 m ²
Zinc (Zn)	$L_{S(Zn)} = \text{Available Zinc Loading in Stream} = C_{S(Zn)} - C_{R(Zn)} \times Q_d(\text{MGD}) \times 8.34 =$	186 lbs/Day
	$L_{D-MAX(Zn)} = \text{Current Maximum Discharge Zinc Loading exceeding criteria} = (C_{E(Zn)} - C_{R(Zn)}) \times Q_d(\text{MGD}) \times 8.34 =$	238 lbs/Day
	$\%P_{E(Zn)} = \text{Percent of Stream Capacity for Current Loading} = L_{D-MAX(Zn)} / L_{S(Zn)} =$	128% of Stream Capacity
	$L_{D(P)} = \text{Proposed Discharge Zn Loading exceeding criteria after Treatment Facility Upgrades} = (C_{P(Zn)} - C_{R(Zn)}) \times Q_d(\text{MGD}) \times 8.34 =$	238.47396 lbs/Day
	$\%P_{P(Zn)} = \text{Percent of Stream Capacity for Proposed Loading} = L_{D(P)} / L_{S(Zn)} =$	128.21% of Stream Capacity
Proposed Area of Impact due to Zinc * = $(\%P_{P(Zn)} \times W_3)^2 \times 0.5 =$ * assuming equal flow across transect and 90° spread at discharge		262.47 m ²
Ammonia-Nitrogen (NH3-N)	$L_{S(NH3-N)} = \text{Available NH3-N Loading in Stream} = C_{S(NH3-N)} - C_{R(NH3-N)} \times Q_d(\text{MGD}) \times 8.34 =$	59 lbs/Day
	$L_{D-MAX(NH3-N)} = \text{Current Maximum Discharge NH3-N Loading} = C_{E(NH3-N)} \times Q_d(\text{MGD}) \times 8.34 =$	13 lbs/Day
	$\%P_{E(NH3-N)} = \text{Percent of Stream Capacity for Current Loading} = L_{D-MAX(NH3-N)} / L_{S(NH3-N)} =$	22% of Stream Capacity
	$L_{D(P)} = \text{Proposed Discharge NH3-N Loading after Treatment Facility Upgrades} = C_{P(NH3-N)} - C_{R(NH3-N)} \times Q_d(\text{MGD}) \times 8.34 =$	-2 lbs/Day
	$\%P_{P(NH3-N)} = \text{Percent of Stream Capacity for Proposed Loading} = L_{D(P)} / L_{S(NH3-N)} =$	-3.39% of Stream Capacity
Proposed Area of Impact due to NH3-N * = $(\%P_{P(NH3-N)} \times W_3)^2 \times 0.5 =$ * assuming equal flow across transect and 90° spread at discharge		0.18 m ²

NPDES Permit Fact Sheet

NPDES Permit No. PA0100277
North & South Shenango Joint STP

2/8/2022

Outfall 001

Facility:	North & South Shenango Joint STP		
Permit Number:	PA0100277	Effective: Pending	Expiration:
Outfall No:	001		
Location:	Jamestown, PA		
Discharge to:	Shenango River		
Site Specific Mussel Survey Completed:	None		

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

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

Concentration (C _T)	Chloride (Cl ⁻)	Nickel (Ni)	Zinc (Zn)	Ammonia-Nitrogen (NH ₃ -N)
$Q_{A(Cl)}C_{S(Cl)} + Q_0C_{P(Cl)} = Q_T C_{C(Cl)}$				
$Q_{A(Cl)} = \text{Assimilative Stream Flow Required to Achieve Criteria (cfs)}$				
$Q_T = Q_S + Q_0 \text{ (cfs)}$				
$Q_{A(Cl)}C_{S(Cl)} + Q_0C_{P(Cl)} = (Q_0 + Q_S)C_{C(Cl)}$				
SOLVING FOR $Q_{A(Cl)} = [(Q_0C_{P(Cl)} / C_{C(Cl)}) - Q_0] / (1 - C_{S(Cl)} / C_{C(Cl)}) =$	-1.64296915 cfs			
$\%P_{(Cl)} = \text{Percent of Stream Width Required to Assimilate Chlorides to Criteria}$				
Concentration = $Q_{A(Cl)} / Q_S \text{ (cfs)} =$	-14.6563%			
$W_{I(Cl)} = \text{Proposed Width of Stream required to Assimilate Chlorides to Criteria}$				
Concentration = $W_S \times \%P_{(Cl)}$	-2.619077 meters			
Proposed Area of Impact due to Chloride * = $(W_{I(Cl)})^2 \times 0.5 =$	3.43 m ²			
* assuming equal flow across transect and 90° spread at discharge				
$Q_{A(Ni)}C_{S(Ni)} + Q_0C_{P(Ni)} = Q_T C_{C(Ni)}$				
$Q_{A(Ni)} = \text{Assimilative Stream Flow Required to Achieve Criteria (cfs)}$				
$Q_T = Q_S + Q_0 \text{ (cfs)}$				
$Q_{A(Ni)}C_{S(Ni)} + Q_0C_{P(Ni)} = (Q_0 + Q_S)C_{C(Ni)}$				
SOLVING FOR $Q_{A(Ni)} = [(Q_0C_{P(Ni)} / C_{C(Ni)}) - Q_0] / (1 - C_{S(Ni)} / C_{C(Ni)}) =$	-2.63067 cfs			
$\%P_{(Ni)} = \text{Percent of Stream Width Required to Assimilate Nickel to Criteria}$				
Concentration = $Q_{A(Ni)} / Q_S \text{ (cfs)} =$	-23.4672%			
$W_{I(Ni)} = \text{Proposed Width of Stream required to Assimilate Nickel to Criteria}$				
Concentration = $W_S \times \%P_{(Ni)}$	-4.193584 meters			
Proposed Area of Impact due to Nickel * = $(W_{I(Ni)})^2 \times 0.5 =$	8.79 m ²			
* assuming equal flow across transect and 90° spread at discharge				
$Q_{A(Zn)}C_{S(Zn)} + Q_0C_{P(Zn)} = Q_T C_{C(Zn)}$				
$Q_{A(Zn)} = \text{Assimilative Stream Flow Required to Achieve Criteria (cfs)}$				
$Q_T = Q_S + Q_0 \text{ (cfs)}$				
$Q_{A(Zn)}C_{S(Zn)} + Q_0C_{P(Zn)} = (Q_0 + Q_S)C_{C(Zn)}$				
SOLVING FOR $Q_{A(Zn)} = [(Q_0C_{P(Zn)} / C_{C(Zn)}) - Q_0] / (1 - C_{S(Zn)} / C_{C(Zn)}) =$	13.9144243 cfs			
$\%P_{(Zn)} = \text{Percent of Stream Width Required to Assimilate Zinc to Criteria}$				
Concentration = $Q_{A(Zn)} / Q_S \text{ (cfs)} =$	124.1251%			
$W_{I(Zn)} = \text{Proposed Width of Stream required to Assimilate Zinc to Criteria}$				
Concentration = $W_S \times \%P_{(Zn)}$	22.181156 meters			
Proposed Area of Impact due to Zinc * = $(W_{I(Zn)})^2 \times 0.5 =$	246.00 m ²			
* assuming equal flow across transect and 90° spread at discharge				
$Q_{A(NH3-N)}C_{S(NH3-N)} + Q_0C_{P(NH3-N)} = Q_T C_{C(NH3-N)}$				
$Q_{A(NH3-N)} = \text{Assimilative Stream Flow Required to Achieve Criteria (cfs)}$				
$Q_T = Q_S + Q_0 \text{ (cfs)}$				
$Q_{A(NH3-N)}C_{S(NH3-N)} + Q_0C_{P(NH3-N)} = (Q_0 + Q_S)C_{C(NH3-N)}$				
SOLVING FOR $Q_{A(NH3-N)} = [(Q_0C_{P(NH3-N)} / C_{C(NH3-N)}) - Q_0] / (1 - C_{S(NH3-N)} / C_{C(NH3-N)}) =$	-0.453745 cfs			
$\%P_{(NH3-N)} = \text{Percent of Stream Width Required to Assimilate NH3-N to Criteria}$				
Concentration = $Q_{A(NH3-N)} / Q_S \text{ (cfs)} =$	-4.0477%			
$W_{I(NH3-N)} = \text{Proposed Width of Stream required to Assimilate NH3-N to Criteria}$				
Concentration = $W_S \times \%P_{(NH3-N)}$	-0.723320 meters			
Proposed Area of Impact due to NH3-N * = $(W_{I(NH3-N)})^2 \times 0.5 =$	0.26 m ²			
* assuming equal flow across transect and 90° spread at discharge				