pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0028142**
Facility Type	**Non-Municipal**	APS ID	**36014**
Major / Minor	**Major**	Authorization ID	**1150993**

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**PA Department Of Military & Veterans Affairs Army National Guard**	Facility Name	**Fort Indiantown Gap Military Ops & ADM**
Applicant Address	Bldg 0-11 Fort Indiantown Gap	Facility Address	Bldg 0-11 Fort Indiantown Gap
	Annville, PA 17003		Annville, PA 17003
Applicant Contact	Donald Paul	Facility Contact	Donald Paul
Applicant Phone	(717) 861-8100	Facility Phone	(717) 861-8100
Client ID	142907	Site ID	453633
Ch 94 Load Status	Existing Hydraulic Overload	Municipality	East Hanover Township
Connection Status	Dept. Imposed Connection Prohibitions	County	Lebanon
Date Application Received	May 24, 2016	EPA Waived?	No
Date Application Accepted	October 28, 2016	If No, Reason	Major Facility, Significant CB Discharge
Purpose of Application	NPDES Permit Renewal for discharge of treated sewage		

Summary of Review

1.0 General Discussion

This fact sheet supports the renewal of an existing NPDES permit for discharge of treated domestic wastewater from Fort Indiantown Gap (FTIG) wastewater treatment plant (WWTP) which serves the base and the Township of Ono. PA Department of Military and Veterans Affairs owns, operates, and maintains the WWTP. The facility is located in East Hanover Township in Lebanon County. The sewer collection system is not combined. The treatment plant is a sequencing batch reactor with a hydraulic design capacity of 2.5MGD and an annual average design capacity of 1MGD. The organic design capacity of the facility is 2,085 lbs/day- BOD5. The facility discharge treated sewage via outfall 001 to Swatara Creek classified for warm water fishes (WWF). The facility also discharges storm water through outfalls 002 to 006 to Aires Run and Qureg Run. The existing NPDES permit was issued on November 11, 2011 with an effective date of December 1, 2011 and expiration date of November 30, 2016. The applicant submitted permit renewal application to the Department and is currently operating under the terms and conditions in the existing permit pending Department action on the renewal application. A draft permit was issued to the permittee on March 14, 2019 but was not finalized due to compliance issues at the site. The permit will be redrafted due to changes in permit template and revisions to water quality standards. A topographic map showing the discharge location is presented in attachment A.

1.1 Sludge use and disposal description and location(s):

Waste activated sludge is directed to the 2 aerobic digesters for digestion. Digested sludge is dewatered using volute sludge press and hauled out for land application under biosolid permit No. PAG08-3607 or to a landfill as needed.

Approve	Deny	Signatures	Date
X		*J. Pascal Kwedza* J. Pascal Kwedza, P.E. / Environmental Engineer	April 11, 2021
X		*Maria D. Bebenek for Daniel W. Martin* Daniel W. Martin, P.E. / Environmental Engineer Manager	April 29, 2021
X		*Maria D. Bebenek* Maria D. Bebenek, P.E./ Program Manager	April 29, 2021

Summary of Review

1.2 Public Participation

DEP will publish notice of the receipt of the NPDES permit application and a tentative decision to issue the individual NPDES permit in the *Pennsylvania Bulletin* in accordance with 25 Pa. Code § 92a.82. Upon publication in the *Pennsylvania Bulletin*, DEP will accept written comments from interested persons for a 30-day period (which may be extended for one additional 15-day period at DEP's discretion), which will be considered in making a final decision on the application. Any person may request or petition for a public hearing with respect to the application. A public hearing may be held if DEP determines that there is significant public interest in holding a hearing. If a hearing is held, notice of the hearing will be published in the *Pennsylvania Bulletin* at least 30 days prior to the hearing and in at least one newspaper of general circulation within the geographical area of the discharge.

1.3 Changes to the existing Permit

- The monitoring frequency for Total Nitrogen species have increased to 2/week per the new requirements of the Chesapeake Bay Program. The "Phase 2 Watershed Implementation Plan Wastewater Supplement" (September 17, 2015) states that "the minimum monitoring frequency for TN species and TP in new or renewed NPDES permits for significant sewage dischargers will be 2/week."
- UV transmittance monitoring has been added to the permit.
- Copper Monitoring discontinued
- Monthly monitoring of E.Coli has been added

1.4 Existing Permit Limits and Monitoring Requirements

DISCHARGE LIMITATIONS								MONITORING REQUIREMENTS	
	Mass Units lbs/day			Concentrations mg/l					
Discharge Parameter	Average Monthly	Average Weekly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily	Inst. Maximum	Monitoring Frequency	Sample Type
Flow (mgd)	Monitor & Report	XXX	Monitor & Report	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	XXX	From 6.0 to 9.0 inclusive				1/day	Grab
D.O.	XXX	XXX	XXX	Minimum of 5.0 mg/l at all times				1/day	Grab
TSS	250	XXX	XXX	30	XXX	XXX	60	2/week	24-hour comp
$CBOD_5$	209	XXX	XXX	25	XXX	XXX	50	2/week	24-hour comp
NH3N (5/1 to 10/31)	31	XXX	XXX	12	XXX	XXX	24	2/week	24-hour comp
NH3N (11/1 to 4/30)	Report	XXX	XXX	Report	XXX	XXX	Report	2/week	24-hour comp
Fecal Col. (5/1 to 9/30)	XXX	XXX	XXX	200	XXX	XXX	1,000	2/week	Grab
Fecal Col. (10/1 to 4/30)	XXX	XXX	XXX	2,000	XXX	XXX	10,000	2/week	Grab
Total Phosphorus	25	XXX	XXX	2.0	XXX	XXX	4.0	2/week	24-hour comp
Total Copper	XXX	XXX	XXX	XXX	XXX	Report	XXX	2/month	24-hour comp

Summary of Review

1.4.1 Chesapeake Bay Limits

Discharge Parameter	Effluent Limitations					Monitoring Requirements	
	Mass Load(lbs)		Concentrations (mg/l)				
	Monthly	Annual	Minimum	Monthly Average	Maximum	Minimum Measurement Frequency	Required Sample Type
Ammonia---N	Report	Report	XXX	Report	XXX	2/week	24-hr Comp
Kjeldahl---N	Report	XXX	XXX	Report	XXX	1/Week	24-hr Comp
Nitrate-Nitrite as N	Report	XXX	XXX	Report	XXX	1/Week	24-hr Comp
Total Nitrogen	Report	Report	XXX	Report	XXX	1/Month	Calculate
Total Phosphorus	Report	Report	XXX	Report	XXX	2/week	24-hr Comp
Net Total Nitrogen	Report	24,353	XXX	XXX	XXX	1/Month	Calculate
Net Total Phos.	Report	3,044	XXX	XXX	XXX	1/Month	Calculate

2.0 Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	1.0
Latitude	40º 23' 56.92"	Longitude	-76º 34' 5.88"
Quad Name	Indiantown Gap	Quad Code	1931
Wastewater Description:	Sewage Effluent		

Receiving Waters	Swatara Creek	Stream Code	09361
NHD Com ID	56396887	RMI	29.7
Drainage Area	323	Yield (cfs/mi^2)	0.0656
Q_{7-10} Flow (cfs)	21.2	Q_{7-10} Basis	USGS Gage Station
Elevation (ft)	363	Slope (ft/ft)	
Watershed No.	7-D	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment			
Source(s) of Impairment			
TMDL Status		Name	

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

Nearest Downstream Public Water Supply Intake	PA American Company		
PWS Waters	Swatara Creek	Flow at Intake (cfs)	
PWS RMI		Distance from Outfall (mi)	>13

Changes Since Last Permit Issuance: None**.**

2.1 Water Supply Intake

The closest water supply intake located downstream from the discharge is PA American Company at approximately 13 miles on Swatara Creek. Because of the dilution and distance, the discharge will have no impact on the intake.

3.0Treatment Facility Summary

Treatment Facility Name: Fort Indiantown Gap

WQM Permit No.	Issuance Date
3801401	7/5/2005
3801401	7/24/2013

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary With Ammonia And Phosphorus	Sequencing Batch Reactor	Ultraviolet	1

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
2.5	2085	Overloaded	Aerobic Digestion	Other WWTP

Changes Since Last Permit Issuance: Permit was amended in 2013 to install chemical feed system for caustic soda injection at Area 14 Pump Station and/or into filter backwash line to control odors and minimize corrosion at the treatment plant.

3.1 Treatment Facility

The treatment plant consists of grit chamber, mechanical bar screen, influent pump station, flow splitter, two SBRs, 2 Aqua-aerobic disk filters, 2 aerobic digesters, volute press for sludge dewatering, UV disinfection system, a post EQ tank and storm overflow basin(treatment retention basin). A septage receiving station has been added adjacent to the headworks to receive hauled-in wastes.

3.2 Chemicals

Currently Micro C is the only chemical utilized at the site. Delpac and polymer are on site but are not being used.

4.0 Compliance History

4.1 DMR Data for Outfall 001 (from March 1, 2020 to February 28, 2021)

Parameter	FEB-21	JAN-21	DEC-20	NOV-20	OCT-20	SEP-20	AUG-20	JUL-20	JUN-20	MAY-20	APR-20	MAR-20
Flow (MGD) Average Monthly	0.77	0.5	0.75	1.89	1.79	0.10	0.30	0.26	0.62	0.58	0.76	0.70
Flow (MGD) Daily Maximum	3.02	1.89	3.79	9.59	10.83	0.86	2.53	1.09	2.35	3.48	3.56	2.69
pH (S.U.) Minimum	6.4	6.5	6.5	6.4	6.6	6.3	6.8	6.8	6.7	6.7	6.7	6.5
pH (S.U.) Maximum	7.4	7.1	8.1	7.1	7.2	7.2	7.1	7.2	7.3	7.0	7.1	7.0
DO (mg/L) Minimum	7.7	9.1	7.3	7.0	6.4	6.1	5.7	5.5	5.2	6.5	6.9	7.8
CBOD5 (lbs/day) Average Monthly	< 17.1	< 8	< 7.4	< 41.4	< 28.9	< 2.1	< 6.7	< 1.7	< 6.2	< 7.5	< 22.0	13.9
CBOD5 (mg/L) Average Monthly	< 3.4	< 2	< 2.0	< 2.7	< 2.0	< 2.2	< 2.0	< 2.7	< 2.4	< 2.3	< 2.4	3.4
BOD5 (lbs/day) Raw Sewage Influent Ave. Monthly	492.2	474.3	< 236.6	611.7	604.9	350.6	429.1	373.6	408.9	286.7	465.4	434
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	658.7	547.0	< 310.8	1401.1	1255.5	485	494.8	651.0	621.7	500.4	829.1	525.6
BOD5 (mg/L) Raw Sewage Influent Ave. Monthly	211.6	< 147.5	< 88.6	268.2	414.6	238.8	191.1	177.8	187.4	131.5	84.6	134.6
TSS (lbs/day) Average Monthly	< 53.3	< 16	< 15.1	< 103.6	< 58.2	< 3.4	< 16.3	< 3.5	< 15.1	< 18.3	< 22.3	< 15.1
TSS (lbs/day) Raw Sewage Influent Ave. Monthly	250.4	240.9	309.6	< 103.6	187.8	193.7	437.4	327.7	118.6	174.5	229.5	284.3
TSS (lbs/day) Raw Sewage Influent Daily Maximum	463.4	310.5	652.4	< 103.6	267.9	250.7	805.0	423.0	178.7	254.4	364.5	349.9
TSS (mg/L) Average Monthly	< 7.9	< 4	< 4.2	< 13.0	< 4.2	< 3.6	< 4.5	< 5.0	< 6.0	< 6	< 1.8	< 3.6
TSS (mg/L) Raw Sewage Influent Ave. Monthly	125.2	84.0	126.4	< 13.0	122.9	132.3	170.6	169.8	48.6	83	60.0	91.3

Fecal Coliform (CFU/100 ml) Geometric Mean	< 1.6	< 10.2	< 3.7	< 358.7	< 34.1	< 32.2	< 17.0	< 3.2	< 5.0	< 1.8	< 1.6	< 1.1
Fecal Coliform (CFU/100 ml) Instant. Maximum	53	1500	180	6400	3800	600	2300	48.0	677.0	90.0	84.0	2.0
Nitrate-Nitrite (mg/L) Average Monthly	< 0.9	3.8	4.3	1.0	4.1	8.6	2.1	1.4	2.2	0.9	1.2	0.7
Nitrate-Nitrite (lbs) Total Monthly	< 100.5	487.4	413.5	590.8	2211.3	121.4	46.7	49.6	125.5	76.4	369.4	98.2
Total Nitrogen (mg/L) Average Monthly	1.6	4.3	5.1	2.3	4.9	9.3	2.7	2.6	3.2	4.9	2.2	< 2.2
Total Nitrogen (lbs) Effluent Net Total Monthly	165.8	559.2	493.2	1130.9	2382.3	144.3	81.9	116.7	198.9	152.8	714.8	< 313.8
Total Nitrogen (lbs) Total Monthly	165.8	559.2	493.2	1130.9	2382.3	144.3	81.9	116.7	198.9	152.8	714.8	< 313.8
Total Nitrogen (lbs) Effluent Net Total Annual						< 4527						
Total Nitrogen (lbs) Total Annual						< 4527						
Ammonia (lbs/day) Average Monthly	< 0.6	< 0.4	< 0.4	< 2.0	< 1.4	< 0.1	< 0.3	< 0.1	< 0.7	< 0.3	< 1.2	< 0.5
Ammonia (mg/L) Average Monthly	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1
Ammonia (lbs) Total Monthly	< 17.6	< 12.8	493.2	< 59.2	< 44.8	< 2.9	< 10.2	< 2.7	< 21.7	152.8	714.8	< 14.6
Ammonia (lbs) Total Annual						< 367						
TKN (mg/L) Average Monthly	< 0.9	< 0.5	< 0.8	< 1.3	0.8	< 0.7	< 0.6	1.2	1.3	< 0.7	< 1.0	< 1.4
TKN (lbs) Total Monthly	< 80.3	< 71.8	< 79.7	< 330.7	171	< 22.9	< 35.2	67.1	83.8	< 76.4	< 345.4	< 215.6
Total Phosphorus (lbs/day) Average Monthly	< 1.1	1.0	< 0.7	< 2.5	8.6	0.6	2.8	1.1	4.4	1.4	< 3.5	0.5
Total Phosphorus (mg/L) Average Monthly	< 0.16	0.2	< 0.2	< 0.26	0.7	1.35	1.58	2.05	1.78	0.59	< 0.57	0.11
Total Phosphorus (lbs) Effluent Net Total Monthly	< 31.6	29.9	< 22.4	< 75.3	266.7	16.7	86.9	33.7	130.7	42.6	< 104.9	15.1

Total Phosphorus (lbs) Total Monthly	< 31.6	29.9	< 22.4	< 75.3	266.7	16.7	86.9	33.7	130.7	42.6	< 104.9	15.1
Total Phosphorus (lbs) Effluent Net Total Annual						< 896						
Total Phosphorus (lbs) Total Annual						< 896						
Total Copper (mg/L) Average Monthly	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.02	< 0.01	< 0.01

4.2 Effluent Violations for Outfall 001, from: April 1, 2020 To: February 28, 2021

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
Fecal Coliform	08/31/20	IMAX	2300	CFU/100 ml	1000	CFU/100 ml
Fecal Coliform	08/31/20	IMAX	2300	CFU/100 ml	1000	CFU/100 ml
Fecal Coliform	08/31/20	IMAX	2300	CFU/100 ml	1000	CFU/100 ml
Total Phosphorus	07/31/20	Avg Mo	2.05	mg/L	2.0	mg/L

4.3 Summary of DMRs:

DMR summary of the past 12-month of operation is attached in section 4.1. Four DMR violations were noted for the past 12 months of operation as shown in section 4.2 above. The violation appears to be one-time occurrence that have been addressed.

4.4 Summary of Inspections:

Th facility was inspected several times during the previous permit cycle. No effluent violations noted during inspections but, a series sanitary sewer overflows and headworks emergency overflows occurred. These overflows have reduced after I&I projects and repairs have been completed within the collection system. The permittee will continue to take steps to completely address recurrence of sanitary sewer overflows at pump stations and emergency bypasses at the headworks.

5.0 Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 1
Latitude 40º 23' 57.00" **Longitude** -76º 34' 6.00"
Wastewater Description: Sewage Effluent

5.1 Basis for Effluent Limitations

In general, the Clean Water Act(AWA) requires that the effluent limits for a particular pollutant be the more stringent of either technology-based limits or water quality-based limits. Technology-based limits are set according to the level of treatment that is achievable using available technology. A water quality-based effluent limit is designed to ensure that the water quality standards applicable to a waterbody are being met and may be more stringent than technology-based effluent limits.

5.2 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)
	30	Average Monthly	133.102(b)(1)	92a.47(a)(1)
Total Suspended Solids	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)

Comments: Weekly averages are not applicable to this discharge.

5.3 Mass-Based Limits

The federal regulation at 40 CFR 122.45(f) requires that effluent limits be expressed in terms of mass, if possible. The regulation at 40 CFR 122.45(b) requires that effluent limitations for POTWs be calculated based on the design flow of the facility. The mass-based limits are expressed in pounds per day and are calculated as follows:

Mass based limit (lb/day) = concentration limit (mg/L) × design flow (mgd) × 8.34

5.4 Water Quality-Based Limitations

5.4.1 Receiving Stream

The receiving stream is the Swatara Creek. According to 25 PA § 93.9, this stream is protected for Warm Water Fishes (WWF) and Migratory Fishes (MF). It is located in Drainage List N and State Watershed 7-D. It has been assigned stream code 09361. According to eMapPA, the segment of Swatara Creek receiving the discharge is attaining its designated uses.

5.4.2 Streamflow:

Streamflows for the water quality analysis were determined by correlating with the yield of USGS gauging station No 01573000 on Swatara Creek at Harper Tavern. The Q_{7-10} and drainage area at the gage is 22.1ft3/s and 337 mi^2 respectively. The resulting yields are as follows:

- Q_{7-10} = (22.1ft^3/s)/337 mi^2 = 0.0656ft^3/s/ mi^2
- Q_{30-10} / Q_{7-10} = 1.40
- Q_{1-10} / Q_{7-10} = 0.80

The drainage area at discharge is calculated by USGS StreamStats = 323 mi^2

The Q_{7-10} at discharge = 323 mi^2 x 0.0.0656ft^3/s/mi^2 = 21.2 ft^3/s.

5.4.3 NH_3N Calculations

NH_3N calculations will be based on the Department's Implementation Guidance of Section 93.7 Ammonia Criteria, dated 11/4/97 (ID No. 391-2000-013). The following data is necessary to determine the instream NH_3N criteria used in the attached computer model of the stream:

*	Discharge pH	= 6.80 (July -Sept DMR median)
*	Discharge Temperature	= 25 ^{o} C (Default)
*	Stream pH	= 7.0 (Default)
*	Stream Temperature	= 20^{o}C (Default)
*	Background NH_3-N	= 0.0 (default)
*	Discharge flow	= 1.0MGD

5.4.4 $CBOD_5$

Due to the proximity of Fredericksburg S&W Auth's Monroe Valley STP's discharge and that of Northern Lebanon County STP's discharge to Fort Indiantown Gap's discharge the three discharges were modelled together. The attached results of the WQM 7.0 version 1.1 stream model presented in attachment B indicates an average monthly limit of 25 mg/l is adequate to protect the water quality of the stream from Fort Indiantown Gap's discharge. The results reveal some level of interaction between the three discharges. The recommended limit is consistent with the existing technology limit in the permit. Therefore, the existing monthly limit(AML) of 25mg/l and instantaneous maximum(IMAX) limit of 50mg/l will remain in the permit. Past DMRs and inspection reports show the facility has been complying with the limitation. Mass limits are calculated as follows:

Mass based AML (lb/day) = 25 (mg/L) × 1(mgd) × 8.34 = 209

5.4.5 NH_3-N

The attached results of the WQM 7.0 version 1.1 stream model (attachment B) also indicates that a summer limitation of 20mg/l NH_3 as a monthly average is necessary to protect the aquatic life from toxicity effects. However, due to anti-backsliding restrictions, the existing summer limit of 12 mg/l and monitoring requirement for winter months will remain in the permit. Mass limits for the summer are calculated as follows:

Mass based AML (lb/day) for the summer months = 12 (mg/L) × 1.0(mgd) × 8.34 = 100

5.4.6 Dissolved Oxygen

The existing permit contains a limit of 5 mg/l for Dissolved Oxygen (DO). DEP's Technical Guidance for the Development and Specification of Effluent Limitations (362-0400-001, 10/97) suggests that either the adopted minimum stream D.O. criteria for the receiving stream or the effluent level determined through water quality modeling be used for the limit. Since the WQM 7.0 version 1.1 model was run using a minimum D.O. of 5.0 mg/l, this limit will be continued in the renewed permit with a daily monitoring requirement per DEP guidance.

5.4.7 Total Suspended Solids(TSS):

There is no water quality criterion for TSS. The existing limit of 30 mg/l AML in the permit based on the minimum level of effluent quality attainable by secondary treatment as defined in 40 CFR 133.102b(1) and 25 PA § 92a.47(a)(1) will be carried forward. Mass limits for TSS are calculated as follows:

Mass based AML (lb/day) = 30 (mg/L) × 1(mgd) × 8.34 = 250

5.4.8 Total Residual Chlorine:

The discharge does not have any reasonable potential to cause or contribute to a water quality standards violation for total residual chlorine since the permittee utilizes UV instead of chlorine for wastewater disinfection. Therefore, the proposed permit does not contain effluent limits for total residual chlorine. The permittee may use chlorine-based chemicals for cleaning and is required to optimize chlorine usage to prevent negative impacts on receiving stream. Daily UV transmittance monitoring in % will be required in the permit to ensure efficiency of the UV unit.

5.4.9 Toxics

A reasonable potential (RP) was done for pollutant Groups 1 through 5 submitted with the application. All pollutants that were presented in the application sampling data were entered into DEP's Toxics Management Spreadsheet(TMS) which combines the logic in the previous Toxics Screening Analysis Spreadsheet and PENTOXSD Model to calculate WQBELs. The most stringent WQBELs recommended by the TMS are presented in attachment C. The discharge levels for all parameters analyzed were well below DEP's target quantitation limits(TQL) and calculated WQBELs therefore no limitation or monitoring is required in the permit for those pollutants. Monitoring of copper required in the existing permit will be discontinued because the copper based chemical usage that triggered the monitoring requirement is no longer used at the facility.

5.4.10 Total Phosphorus:

The existing phosphorus AML of 2mg/l to control phosphorus discharges to the Lower Susquehanna River Basin has been superseded by the Chesapeake Bay Strategy but would be continued due to anti-backsliding.

Mass based AML (lb/day) = 2 (mg/L) × 0.75(mgd) × 8.34 = 16.7

5.4.11 Chesapeake Bay Strategy:

The Department formulated a strategy in April 2007, to comply with the EPA and Chesapeake Bay Foundation requirements to reduce point source loadings of Total Nitrogen (TN) and Total Phosphorus (TP) to the Bay. In the Strategy, sewage dischargers have been prioritized by Central Office based on their delivered TN loadings to the Bay. The highest priority (Phases 1, 2, and 3) dischargers will receive annual loading caps based on their design flow on August 29, 2005 and concentrations of 6 mg/l TN and 0.8 mg/l TP. Phase 4 (0.2 -0.4mgd) and Phase 5(below 0.2mdg) will be required to monitor and report TN and TP during permit renewal at a monitoring frequency following Table 6-3 of DEP's Technical Guidance for Development and Specification of effluent Limitations (No. 362-0400-001). Any facility in Phases 4 and 5 that undergoes expansion is subjected to cap load right away.

EPA published the Chesapeake Bay TMDL in December of 2010. In order to address the TMDL, Pennsylvania developed Chesapeake Watershed Implementation Plan (WIP) Phase 1, Phase 2 and currently Phase 3 WIP and a supplement to the WIPs in addition to the original Chesapeake Bay Strategy. As outlined in the current Phase 3 WIP and supplement to the WIP, re-issuing permits for significant dischargers would follow the same phased approach formulated in the original Bay strategy

This facility is classified as a significant discharger in the Chesapeake Bay watershed and was one of the few facilities that voluntarily agreed to receive an annual cap load based on 2010 flows at 8 mg/l Total Nitrogen(TN) and 1 mg/l Total Phosphorus(TP). The facility's 2010 flow was 1MGD which resulted in annual TN load of 24,353 lbs/year and annual TP load 3,044 lbs/year. The annual loads will be continued in the current permit. The facility is in compliance with the load requirements.

5.4.12 Stormwater

The previous permit listed 5 outfalls as stormwater outfalls. Outfalls 002 -005 receive storm water from the 2 main drainage areas of the base and outfall 006 receives storm water from the treatment plant site. Consistent with stormwater requirements of 40CFR 122.26(b)(14)(ix), part C of the permit will require compliance with the standard requirements applicable to stormwater outfalls for 002, 003, 004, 005 and 006 with best management practices. In addition, Outfall 004 shall be monitored once a year for Total Suspended Solids and Oil and Grease due to its proximity to fueling area. The monitoring results should be submitted with the annual storm water inspection form. Location of the outfalls and the receiving streams are as follows: 002 (40°25'43"/76°35'26") discharges to UNT Velse Run, 003 (40°26'24"/76°33'49")) discharges to Aires Run, 004 (40°25'49"/76°33'22") located on Aires Run, 005 (40°25'55"/76°33'44") is located Qureg Run and Outfall 006 (40°25'36"/76°33'06") located Qureg Run.

Outfall details and description is shown the table below:

Outfall No.	Area Drained (ft^2)	Latitude	Longitude	Description
002	1,440,000 ft^2	40°25'43"	76°35'26"	Houses, roadways, and vegetated areas.
003	2,700,000 ft^2	40° 26' 24	76° 33' 49"	Airfield, parking lots and vegetated areas.
004*	1,365,000 ft^2	40° 25' 49"	76° 33' 22"	Fueling point, the recycling building, roadways and vegetated areas.
005	4,080,000 ft^2	40° 25' 55"	76° 32' 44"	Buildings, gravel/paved parking lots roadways, and vegetated areas.
006	252,553 ft^2	40° 25' 36"	76° 33' 06"	Areas surrounding the wastewater treatment plant.

5.4.13 Pretreatment Requirements

The design annual average flow of the treatment plant is 1 MGD and the facility receives no flow from significant Industrial users. EPA does not require development of pretreatment program for facilities with no industrial flow and design flow less than 5MGD. However, the permit contains standard conditions requiring the permittee to monitor and control industrial users if applicable.

5.4.14 Whole effluent Toxicity (WET)

WET testing has not been required for this facility, 40 CFR 122.21(j)(5) applies primarily to public owned treatment works(POTW) This facility does not qualify as a POTW.

5.4.15 E. Coli

The Water Quality Standards in PA have been updated recently that require monitoring of E.coli in sewage permits. Following 92a.61, DEP developed a standard operation procedure that require sewage permits to include monitoring, at a minimum, for E. Coli, in new and reissued permits, with a monitoring frequency of 1/month for design flows >= 1 MGD, 1/quarter for design flows >= 0.05 and < 1 MGD, 1/year for design flows of 0.002 – 0.05 MGD. This facility has a design flow of 1MGD and will require 1/month monitoring of E.coli.

6.0 Other Requirements

6.1 The permit contains the following special conditions:

1. Stormwater Prohibition. 2. Approval Contingencies, 3. Proper Waste/solids Management, 4. Restriction on receipt of hauled in waste under certain conditions. 5. Requirement to develop a treatment facility operations and maintenance (O&M) plan.

6.2 Sanitary Sewer Overflows(SSO) And emergency Headworks Overflow

The permittee has completed a series of sewer replacement and rehabilitation projects required under a corrective action plan/Memorandum of Understanding signed between the permittee and the Department. However, SSO discharges within

the collection system and emergency sanitary overflows at the headworks continue to occur, the permittee will continue to identify areas of inflow and infiltration and address them until SSO discharges and emergency sanitary overflow discharges at the headworks ceases. The permit does not authorize these discharges however, if they occur, the permittee shall follow reporting requirements in Part C IV in the permit. Due to the SSO discharges and emergency sanitary overflows, the facility is deemed overloaded.

On or before March 31st of each year, the permittee shall submit an annual report to the Department. The report shall identify, include and describe the following, at a minimum:

- Summary of work conducted to rehabilitate the sewage collection system, pump station and any upgrades or modifications to the wastewater treatment plant during the previous year.
- Maps showing where work was completed.
- Collection system flow monitoring data using the four portable flow meters and any other flow measuring devices used.
- Treatment facility flow data.
- Precipitation data.
- Frequency, volume and duration of sanitary sewer overflows at pump stations and sewage bypasses from the headworks structure.
- Solids wasted from biological treatment units and disposed.
- Flow reductions achieved through the rehabilitation work.
- Comparisons of average and peak hydraulic and organic loads to design capacities.
- Summary of sanitary sewer overflow and bypass abatement activities

6.3 Anti-backsliding

Not applicable to this permit. In accordance with 40 CFR 122.44(l)(1) and (2), this draft permit does not propose to relax any existing effluent limitation.

6.4 Anti-Degradation (93.4)

The effluent limits for this discharge have been developed to ensure that existing instream water uses and the level of water quality necessary to protect the existing uses are maintained and protected. No High-Quality Waters are impacted by this discharge. No Exceptional Value Waters are impacted by this discharge.

6.5 Class A Wild Trout Fisheries

No Class A Wild Trout Fisheries are impacted by this discharge.

6.6 303d Listed Streams

The discharge is not located on a 303d listed stream segment.

6.7 Basis for Effluent and Surface Water Monitoring

Section 308 of the CWA and federal regulation 40 CFR 122.44(i) require monitoring in permits to determine compliance with effluent limitations. Monitoring may also be required to gather effluent and surface water data to determine if additional effluent limitations are required and/or to monitor effluent impacts on receiving water quality. The permittee is responsible for conducting the monitoring and for reporting results on Discharge Monitoring Reports (DMRs).

6.8 Effluent Monitoring

Monitoring frequencies are based on the nature and effect of the pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance. Permittees have the option of taking more frequent samples than are required under the permit. These samples can be used for averaging if they are conducted using EPA-approved test methods (generally found in 40 CFR 136) and if the Method Detection Limits are less than the effluent limits.

The sampling location must be after the last treatment unit and prior to discharge to the receiving water. If no discharge occurs during the reporting period, “no discharge” shall be reported on the DMR.

Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (362-0400-001), SOPs and/or BPJ.

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Daily Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	9.0 Daily Max	XXX	1/day	Grab
DO	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
CBOD5	209	XXX	XXX	25	XXX	50	2/week	24-Hr Composite
TSS	250	XXX	XXX	30	XXX	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
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/month	Grab
UV Transmittance (%)	XXX	XXX	Report	XXX	XXX	XXX	1/day	Recorded
Nitrate-Nitrite	XXX	XXX	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Nitrate-Nitrite (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
Total Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	1/month	Calculation
Total Nitrogen (lbs) Effluent Net	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Daily Minimum	Average Monthly	Maximum	Instant. Maximum		
Total Nitrogen (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
Ammonia Nov 1 - Apr 30	Report	XXX	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Ammonia May 1 - Oct 31	100	XXX	XXX	12	XXX	24	2/week	24-Hr Composite
Ammonia (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
TKN	XXX	XXX	XXX	Report	XXX	XXX	2/week	24-Hr Composite
TKN (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
Total Phosphorus	16.7	XXX	XXX	2.0	XXX	4	2/week	24-Hr Composite
Total Phosphorus (lbs) Effluent Net	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
Total Phosphorus (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation

Compliance Sampling Location: At Outfall 001

Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, to comply with Pennsylvania's Chesapeake Bay Tributary Strategy.

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
	Monthly	Annual	Monthly	Monthly Average	Maximum	Instant. Maximum		
Total Nitrogen (lbs) Effluent Net	XXX	24,353 Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation
Total Nitrogen (lbs)	XXX	Report Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation
Ammonia (lbs)	XXX	Report Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation
Total Phosphorus (lbs) Effluent Net	XXX	3,044 Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation
Total Phosphorus (lbs)	XXX	Report Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation

Compliance Sampling Location: At Outfall 001

8.0 Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment **B**)
☐	PENTOXSD for Windows Model (see Attachment)
☐	TRC Model Spreadsheet (see Attachment)
☐	Temperature Model Spreadsheet (see Attachment)
☒	Toxics Management Spreadsheet (see Attachment **C**)
☒	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
☐	Technical Guidance for the Development and Specification of Effluent Limitations, 362-0400-001, 10/97.
☐	Policy for Permitting Surface Water Diversions, 362-2000-003, 3/98.
☒	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 362-2000-008, 11/96.
☐	Technology-Based Control Requirements for Water Treatment Plant Wastes, 362-2183-003, 10/97.
☐	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 362-2183-004, 12/97.
☐	Pennsylvania CSO Policy, 385-2000-011, 9/08.
☐	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
☐	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 391-2000-002, 4/97.
☒	Determining Water Quality-Based Effluent Limits, 391-2000-003, 12/97.
☐	Implementation Guidance Design Conditions, 391-2000-006, 9/97.
☒	Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 391-2000-007, 6/2004.
☐	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 391-2000-008, 10/1997.
☐	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 391-2000-010, 3/99.
☒	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 391-2000-011, 5/2004.
☐	Implementation Guidance for Section 93.7 Ammonia Criteria, 391-2000-013, 11/97.
☐	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 391-2000-014, 4/2008.
☒	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 391-2000-015, 11/1994.
☐	Implementation Guidance for Temperature Criteria, 391-2000-017, 4/09.
☐	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 391-2000-018, 10/97.
☐	Implementation Guidance for Application of Section 93.5(e) for Potable Water Supply Protection Total Dissolved Solids, Nitrite-Nitrate, Non-Priority Pollutant Phenolics and Fluorides, 391-2000-019, 10/97.
☐	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 391-2000-021, 3/99.
☐	Implementation Guidance for the Determination and Use of Background/Ambient Water Quality in the Determination of Wasteload Allocations and NPDES Effluent Limitations for Toxic Substances, 391-2000-022, 3/1999.
☐	Design Stream Flows, 391-2000-023, 9/98.
☐	Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 391-2000-024, 10/98.
☐	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 391-3200-013, 6/97.
☒	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
☒	SOP: Establishing effluent limitation for individual sewage permit
☐	Other:

9.0 Attachments

A. Topographical Map

B. WQM Model Results

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
07D	9361	SWATARA CREEK

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
44.390	Monroe Valley	PA0247570	0.100	CBOD5	25		
				NH3-N	20.26	40.52	
				Dissolved Oxygen			5

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
39.220	Nor Leb Co Auth	PA0080748	0.750	CBOD5	25		
				NH3-N	20.26	40.52	
				Dissolved Oxygen			5

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
29.700	Fort IndianTG	PA0028142	1.000	CBOD5	25		
				NH3-N	20.26	40.52	
				Dissolved Oxygen			5

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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
07D	9361	SWATARA CREEK	**44.390**	417.00	170.00	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.065	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Monroe Valley	PA0247570	0.1000	0.1000	0.1000	0.000	25.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	5.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
07D	9361	SWATARA CREEK	**39.220**	392.00	291.00	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.065	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Nor Leb Co Auth	PA0080748	0.7500	0.7500	0.7500	0.000	25.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	5.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
07D	9361	SWATARA CREEK	**29.700**	363.00	323.00	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.065	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Fort Indian TG	PA0028142	1.0000	1.0000	1.0000	0.000	25.00	6.80

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	5.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
07D	9361	SWATARA CREEK	22.200	343.19	371.00	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.065	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
		0.0000	0.0000	0.0000	0.000	25.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	5.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
07D	9361	SWATARA CREEK

NH3-N Acute Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
44.390	Monroe Valley	16.64	50	16.64	50	0	0
39.220	Nor Leb Co Auth	16.27	50	16.21	50	0	0
29.700	Fort IndianTG	16.48	50	16.05	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
44.390	Monroe Valley	1.88	25	1.88	25	0	0
39.220	Nor Leb Co Auth	1.86	25	1.86	25	0	0
29.700	Fort IndianTG	1.87	25	1.84	25	0	0

Dissolved Oxygen Allocations

RMI	Discharge Name	CBOD5		NH3-N		Dissolved Oxygen		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
44.39	Monroe Valley	25	25	25	20.26	5	5	3	14
39.22	Nor Leb Co Auth	25	25	25	20.26	5	5	3	14
29.70	Fort IndianTG	25	25	25	20.26	5	5	3	14

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WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
07D	9361	SWATARA CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
44.390	0.100	20.069	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
58.995	0.833	70.864	0.228
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.32	0.101	0.28	0.704
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
8.198	1.428	Tsivoglou	5
Reach Travel Time (days)			
1.385			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.138	2.29	0.25	8.22
0.277	2.25	0.23	8.23
0.415	2.22	0.21	8.23
0.554	2.19	0.19	8.23
0.692	2.16	0.17	8.23
0.831	2.13	0.16	8.23
0.969	2.10	0.14	8.23
1.108	2.07	0.13	8.23
1.246	2.04	0.12	8.23
1.385	2.02	0.11	8.23

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
39.220	0.850	20.325	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
80.421	0.926	86.820	0.272
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
3.33	0.234	1.22	0.718
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
8.051	1.077	Tsivoglou	5
Reach Travel Time (days)			
2.142			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.214	3.16	1.05	7.34
0.428	3.01	0.90	6.89
0.643	2.86	0.77	6.62
0.857	2.71	0.66	6.50
1.071	2.58	0.57	6.47
1.285	2.45	0.49	6.52
1.500	2.33	0.42	6.60
1.714	2.21	0.36	6.72
1.928	2.10	0.31	6.86
2.142	2.00	0.26	7.01

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WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
07D	9361	SWATARA CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
29.700	1.850	20.600	6.984
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
87.244	0.951	91.777	0.288
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
3.49	0.337	1.54	0.733
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.983	0.996	Tsivoglou	5
Reach Travel Time (days)			
1.593			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.159	3.30	1.37	6.31
0.319	3.13	1.22	5.83
0.478	2.96	1.08	5.51
0.637	2.80	0.96	5.31
0.797	2.65	0.86	5.20
0.956	2.51	0.76	5.17
1.115	2.37	0.68	5.20
1.275	2.24	0.60	5.27
1.434	2.12	0.54	5.38
1.593	2.01	0.48	5.51

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	☑
WLA Method	EMPR	Use Inputted W/D Ratio	☐
Q1-10/Q7-10 Ratio	0.8	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.4	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	5		

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WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
07D	9361	SWATARA CREEK

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Reach Trav Time (days)	Analysis Temp (°C)	Analysis pH
Q7-10 Flow												
44.390	11.05	0.00	11.05	.1547	0.00092	.833	58.99	70.86	0.23	1.385	20.07	7.00
39.220	18.91	0.00	18.91	1.3149	0.00058	.926	80.42	86.82	0.27	2.142	20.33	7.00
29.700	20.99	0.00	20.99	2.8619	0.00050	.951	87.24	91.78	0.29	1.593	20.60	6.98
Q1-10 Flow												
44.390	8.84	0.00	8.84	.1547	0.00092	NA	NA	NA	0.20	1.568	20.09	7.00
39.220	15.13	0.00	15.13	1.3149	0.00058	NA	NA	NA	0.24	2.406	20.40	7.00
29.700	16.80	0.00	16.80	2.8619	0.00050	NA	NA	NA	0.26	1.776	20.73	6.98
Q30-10 Flow												
44.390	15.47	0.00	15.47	.1547	0.00092	NA	NA	NA	0.27	1.150	20.05	7.00
39.220	26.48	0.00	26.48	1.3149	0.00058	NA	NA	NA	0.32	1.793	20.24	7.00
29.700	29.39	0.00	29.39	2.8619	0.00050	NA	NA	NA	0.34	1.346	20.44	6.99

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C. Toxics Management Spreadsheet(TMS)

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DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.3, March 2021

Discharge Information

Instructions | Discharge | Stream

Facility: **Fort Indiantown Gap STP** NPDES Permit No.: **PA0028142** Outfall No.: **001**

Evaluation Type: **Major Sewage / Industrial Waste** Wastewater Description: **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	100	7						

					0 if left blank		*0.5 if left blank*		*0 if left blank*			*1 if left blank*	
	Discharge Pollutant	Units	Max Discharge Conc		Trib Conc	Stream Conc	Daily CV	Hourly CV	Strea m CV	Fate Coeff	FOS	Criteri a Mod	Chem Transl
Group 1	Total Dissolved Solids (PWS)	mg/L		346									
	Chloride (PWS)	mg/L		138									
	Bromide	mg/L		0.000073									
	Sulfate (PWS)	mg/L		40.9									
	Fluoride (PWS)	mg/L											
Group 2	Total Aluminum	µg/L		19									
	Total Antimony	µg/L		0.62									
	Total Arsenic	µg/L		0.8									
	Total Barium	µg/L		53									
	Total Beryllium	µg/L		0.1									
	Total Boron	µg/L		16									
	Total Cadmium	µg/L		0.16									
	Total Chromium (III)	µg/L		0.33									
	Hexavalent Chromium	µg/L		0.052									
	Total Cobalt	µg/L		0.83									
	Total Copper	µg/L		0.86									
	Free Cyanide	µg/L		1.5									
	Total Cyanide	µg/L		2									
	Dissolved Iron	µg/L		35									
	Total Iron	µg/L		650									
	Total Lead	µg/L	<	0.49									
	Total Manganese	µg/L		6.3									
	Total Mercury	µg/L		0.0007									
	Total Nickel	µg/L		1.8									
	Total Phenols (Phenolics) (PWS)	µg/L	<	5									
	Total Selenium	µg/L		0.66									
	Total Silver	µg/L		0.33									
	Total Thallium	µg/L		0.16									
	Total Zinc	µg/L		16									
	Total Molybdenum	µg/L		0.92									
	Acrolein	µg/L	<	1.9									
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<	1.2									
	Benzene	µg/L	<	0.23									
	Bromoform	µg/L	<	0.4									

Group 3	Carbon Tetrachloride	µg/L	<	0.31										
	Chlorobenzene	µg/L		0.9										
	Chlorodibromomethane	µg/L	<	0.45										
	Chloroethane	µg/L	<	0.33										
	2-Chloroethyl Vinyl Ether	µg/L	<	0.38										
	Chloroform	µg/L	<	1										
	Dichlorobromomethane	µg/L	<	0.27										
	1,1-Dichloroethane	µg/L	<	0.28										
	1,2-Dichloroethane	µg/L	<	0.32										
	1,1-Dichloroethylene	µg/L	<	0.29										
	1,2-Dichloropropane	µg/L	<	0.24										
	1,3-Dichloropropylene	µg/L	<	0.47										
	1,4-Dioxane	µg/L	<	0.64										
	Ethylbenzene	µg/L	<	0.34										
	Methyl Bromide	µg/L	<	0.47										
	Methyl Chloride	µg/L	<	0.39										
	Methylene Chloride	µg/L	<	1.3										
	1,1,2,2-Tetrachloroethane	µg/L	<	0.34										
	Tetrachloroethylene	µg/L	<	0.35										
	Toluene	µg/L	<	0.76										
	1,2-trans-Dichloroethylene	µg/L	<	0.26										
	1,1,1-Trichloroethane	µg/L	<	0.22										
	1,1,2-Trichloroethane	µg/L	<	0.33										
	Trichloroethylene	µg/L	<	0.33										
	Vinyl Chloride	µg/L	<	0.3										
Group 4	2-Chlorophenol	µg/L	<	0.31										
	2,4-Dichlorophenol	µg/L	<	0.3										
	2,4-Dimethylphenol	µg/L	<	0.19										
	4,6-Dinitro-o-Cresol	µg/L	<	0.31										
	2,4-Dinitrophenol	µg/L	<	1.7										
	2-Nitrophenol	µg/L	<	0.42										
	4-Nitrophenol	µg/L	<	0.97										
	p-Chloro-m-Cresol	µg/L	<	0.18										
	Pentachlorophenol	µg/L	<	0.99										
	Phenol	µg/L	<	0.21										
	2,4,6-Trichlorophenol	µg/L	<	0.53										
Group 5	Acenaphthene	µg/L	<	0.14										
	Acenaphthylene	µg/L	<	0.18										
	Anthracene	µg/L	<	0.14										
	Benzidine	µg/L	<	2.9										
	Benzo(a)Anthracene	µg/L	<	0.12										
	Benzo(a)Pyrene	µg/L	<	0.2										
	3,4-Benzofluoranthene	µg/L	<	0.1										
	Benzo(ghi)Perylene	µg/L	<	0.2										
	Benzo(k)Fluoranthene	µg/L	<	0.18										
	Bis(2-Chloroethoxy)Methane	µg/L	<	0.19										
	Bis(2-Chloroethyl)Ether	µg/L	<	0.16										
	Bis(2-Chloroisopropyl)Ether	µg/L	<	0.26										
	Bis(2-Ethylhexyl)Phthalate	µg/L	<	0.2										
	4-Bromophenyl Phenyl Ether	µg/L	<	0.1										
	Butyl Benzyl Phthalate	µg/L	<	0.1										
	2-Chloronaphthalene	µg/L	<	0.17										
	4-Chlorophenyl Phenyl Ether	µg/L	<	0.13										
	Chrysene	µg/L	<	0.11										
	Dibenzo(a,h)Anthrancene	µg/L	<	0.19										
	1,2-Dichlorobenzene	µg/L	<	0.38										
	1,3-Dichlorobenzene	µg/L	<	0.25										
	1,4-Dichlorobenzene	µg/L	<	0.27										
	3,3-Dichlorobenzidine	µg/L	<	0.44										
	Diethyl Phthalate	µg/L	<	0.23										
	Dimethyl Phthalate	µg/L	<	0.13										
	Di-n-Butyl Phthalate	µg/L	<	0.13										
	2,4-Dinitrotoluene	µg/L	<	0.11										

	2,6-Dinitrotoluene	µg/L	<	0.19										
	Di-n-Octyl Phthalate	µg/L	<	0.93										
	1,2-Diphenylhydrazine	µg/L	<	0.24										
	Fluoranthene	µg/L	<	0.16										
	Fluorene	µg/L	<	0.19										
	Hexachlorobenzene	µg/L	<	0.21										
	Hexachlorobutadiene	µg/L	<	0.18										
	Hexachlorocyclopentadiene	µg/L	<	0.16										
	Hexachloroethane	µg/L	<	0.28										
	Indeno(1,2,3-cd)Pyrene	µg/L	<	0.093										
	Isophorone	µg/L	<	0.14										
	Naphthalene	µg/L	<	0.11										
	Nitrobenzene	µg/L	<	0.26										
	n-Nitrosodimethylamine	µg/L	<	0.59										
	n-Nitrosodi-n-Propylamine	µg/L	<	0.22										
	n-Nitrosodiphenylamine	µg/L	<	0.17										
	Phenanthrene	µg/L	<	0.12										
	Pyrene	µg/L	<	0.15										
	1,2,4-Trichlorobenzene	µg/L	<	0.12										
Group 6	Aldrin	µg/L	<											
	alpha-BHC	µg/L	<											
	beta-BHC	µg/L	<											
	gamma-BHC	µg/L	<											
	delta BHC	µg/L	<											
	Chlordane	µg/L	<											
	4,4-DDT	µg/L	<											
	4,4-DDE	µg/L	<											
	4,4-DDD	µg/L	<											
	Dieldrin	µg/L	<											
	alpha-Endosulfan	µg/L	<											
	beta-Endosulfan	µg/L	<											
	Endosulfan Sulfate	µg/L	<											
	Endrin	µg/L	<											
	Endrin Aldehyde	µg/L	<											
	Heptachlor	µg/L	<											
	Heptachlor Epoxide	µg/L	<											
	PCB-1016	µg/L	<											
	PCB-1221	µg/L	<											
	PCB-1232	µg/L	<											
	PCB-1242	µg/L	<											
	PCB-1248	µg/L	<											
	PCB-1254	µg/L	<											
	PCB-1260	µg/L	<											
	PCBs, Total	µg/L	<											
	Toxaphene	µg/L	<											
	2,3,7,8-TCDD	ng/L	<											
Group 7	Gross Alpha	pCi/L												
	Total Beta	pCi/L	<											
	Radium 226/228	pCi/L	<											
	Total Strontium	µg/L	<											
	Total Uranium	µg/L	<											
	Osmotic Pressure	mOs/kg												

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Toxics Management Spreadsheet
Version 1.3, March 2021

Stream / Surface Water Information

Fort Indiantown Gap STP, NPDES Permit No. PA0028142, Outfall 001

Instructions | Discharge | *Stream*

Receiving Surface Water Name: _____ 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	009361	29.7	363	323			Yes
End of Reach 1	009361	22.2	343.19	371			Yes

$Q_{7\text{-}10}$

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	29.7	0.065										100	7		
End of Reach 1	22.2	0.065													

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	29.7														
End of Reach 1	22.2														

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Toxics Management Spreadsheet
Version 1.3, March 2021

Model Results

Fort Indiantown Gap STP, NPDES Permit No. PA0028142, Outfall 001

Instructions | Results | RETURN TO INPUTS | SAVE AS PDF | PRINT | ◉ All ○ Inputs ○ Results ○ Limits

☐ *Hydrodynamics*

☑ *Wasteload Allocations*

☑ *AFC* CCT (min): 15 PMF: 0.189 Analysis Hardness (mg/l): 100 Analysis pH: 7.00

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)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	750	750	2,670	
Total Antimony	0	0		0	1,100	1,100	3,916	
Total Arsenic	0	0		0	340	340	1,210	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	74,751	
Total Boron	0	0		0	8,100	8,100	28,833	
Total Cadmium	0	0		0	2.014	2.13	7.59	Chem Translator of 0.944 applied
Total Chromium (III)	0	0		0	569.763	1,803	6,418	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	58.0	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	338	
Total Copper	0	0		0	13.439	14.0	49.8	Chem Translator of 0.96 applied
Free Cyanide	0	0		0	22	22.0	78.3	
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	64.581	81.6	291	Chem Translator of 0.791 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	5.86	Chem Translator of 0.85 applied
Total Nickel	0	0		0	468.236	469	1,670	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	3.217	3.78	13.5	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	231	
Total Zinc	0	0		0	117.180	120	426	Chem Translator of 0.978 applied
Acrolein	0	0		0	3	3.0	10.7	

Acrylonitrile	0	0		0	650	650	2,314	
Benzene	0	0		0	640	640	2,278	
Bromoform	0	0		0	1,800	1,800	6,407	
Carbon Tetrachloride	0	0		0	2,800	2,800	9,967	
Chlorobenzene	0	0		0	1,200	1,200	4,271	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	18,000	18,000	64,072	
Chloroform	0	0		0	1,900	1,900	6,763	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	15,000	15,000	53,394	
1,1-Dichloroethylene	0	0		0	7,500	7,500	26,697	
1,2-Dichloropropane	0	0		0	11,000	11,000	39,155	
1,3-Dichloropropylene	0	0		0	310	310	1,103	
Ethylbenzene	0	0		0	2,900	2,900	10,323	
Methyl Bromide	0	0		0	550	550	1,958	
Methyl Chloride	0	0		0	28,000	28,000	99,668	
Methylene Chloride	0	0		0	12,000	12,000	42,715	
1,1,2,2-Tetrachloroethane	0	0		0	1,000	1,000	3,560	
Tetrachloroethylene	0	0		0	700	700	2,492	
Toluene	0	0		0	1,700	1,700	6,051	
1,2-trans-Dichloroethylene	0	0		0	6,800	6,800	24,205	
1,1,1-Trichloroethane	0	0		0	3,000	3,000	10,679	
1,1,2-Trichloroethane	0	0		0	3,400	3,400	12,103	
Trichloroethylene	0	0		0	2,300	2,300	8,187	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	560	560	1,993	
2,4-Dichlorophenol	0	0		0	1,700	1,700	6,051	
2,4-Dimethylphenol	0	0		0	660	660	2,349	
4,6-Dinitro-o-Cresol	0	0		0	80	80.0	285	
2,4-Dinitrophenol	0	0		0	660	660	2,349	
2-Nitrophenol	0	0		0	8,000	8,000	28,477	
4-Nitrophenol	0	0		0	2,300	2,300	8,187	
p-Chloro-m-Cresol	0	0		0	160	160	570	
Pentachlorophenol	0	0		0	8.723	8.72	31.1	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	460	460	1,637	
Acenaphthene	0	0		0	83	83.0	295	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	300	300	1,068	
Benzo(a)Anthracene	0	0		0	0.5	0.5	1.78	
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	106,787	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	4,500	4,500	16,018	
4-Bromophenyl Phenyl Ether	0	0		0	270	270	961	
Butyl Benzyl Phthalate	0	0		0	140	140	498	

2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	820	820	2,919	
1,3-Dichlorobenzene	0	0		0	350	350	1,246	
1,4-Dichlorobenzene	0	0		0	730	730	2,598	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	4,000	4,000	14,238	
Dimethyl Phthalate	0	0		0	2,500	2,500	8,899	
Di-n-Butyl Phthalate	0	0		0	110	110	392	
2,4-Dinitrotoluene	0	0		0	1,600	1,600	5,695	
2,6-Dinitrotoluene	0	0		0	990	990	3,524	
1,2-Diphenylhydrazine	0	0		0	15	15.0	53.4	
Fluoranthene	0	0		0	200	200	712	
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	35.6	
Hexachlorocyclopentadiene	0	0		0	5	5.0	17.8	
Hexachloroethane	0	0		0	60	60.0	214	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	10,000	10,000	35,596	
Naphthalene	0	0		0	140	140	498	
Nitrobenzene	0	0		0	4,000	4,000	14,238	
n-Nitrosodimethylamine	0	0		0	17,000	17,000	60,513	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	300	300	1,068	
Phenanthrene	0	0		0	5	5.0	17.8	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	130	130	463	

☑ ***CFC*** CCT (min): ###### PMF: 1 Analysis Hardness (mg/l): 100 Analysis pH: 7.00

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)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	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	3,206	
Total Arsenic	0	0		0	150	150	2,186	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	59,743	
Total Boron	0	0		0	1,600	1,600	23,314	
Total Cadmium	0	0		0	0.246	0.27	3.94	Chem Translator of 0.909 applied
Total Chromium (III)	0	0		0	74.115	86.2	1,256	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	151	Chem Translator of 0.962 applied
Total Cobalt	0	0		0	19	19.0	277	
Total Copper	0	0		0	8.956	9.33	136	Chem Translator of 0.96 applied

Free Cyanide	0	0		0	5.2	5.2	75.8	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	1,500	1,500	21,857	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	2.517	3.18	46.4	Chem Translator of 0.791 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	13.2	Chem Translator of 0.85 applied
Total Nickel	0	0		0	52.007	52.2	760	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	72.7	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	189	
Total Zinc	0	0		0	118.139	120	1,746	Chem Translator of 0.986 applied
Acrolein	0	0		0	3	3.0	43.7	
Acrylonitrile	0	0		0	130	130	1,894	
Benzene	0	0		0	130	130	1,894	
Bromoform	0	0		0	370	370	5,391	
Carbon Tetrachloride	0	0		0	560	560	8,160	
Chlorobenzene	0	0		0	240	240	3,497	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	3,500	3,500	51,000	
Chloroform	0	0		0	390	390	5,683	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	3,100	3,100	45,171	
1,1-Dichloroethylene	0	0		0	1,500	1,500	21,857	
1,2-Dichloropropane	0	0		0	2,200	2,200	32,057	
1,3-Dichloropropylene	0	0		0	61	61.0	889	
Ethylbenzene	0	0		0	580	580	8,451	
Methyl Bromide	0	0		0	110	110	1,603	
Methyl Chloride	0	0		0	5,500	5,500	80,143	
Methylene Chloride	0	0		0	2,400	2,400	34,971	
1,1,2,2-Tetrachloroethane	0	0		0	210	210	3,060	
Tetrachloroethylene	0	0		0	140	140	2,040	
Toluene	0	0		0	330	330	4,809	
1,2-trans-Dichloroethylene	0	0		0	1,400	1,400	20,400	
1,1,1-Trichloroethane	0	0		0	610	610	8,889	
1,1,2-Trichloroethane	0	0		0	680	680	9,909	
Trichloroethylene	0	0		0	450	450	6,557	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	110	110	1,603	
2,4-Dichlorophenol	0	0		0	340	340	4,954	
2,4-Dimethylphenol	0	0		0	130	130	1,894	
4,6-Dinitro-o-Cresol	0	0		0	16	16.0	233	
2,4-Dinitrophenol	0	0		0	130	130	1,894	
2-Nitrophenol	0	0		0	1,600	1,600	23,314	
4-Nitrophenol	0	0		0	470	470	6,849	

p-Chloro-m-Cresol	0	0		0	500	500	7,286	
Pentachlorophenol	0	0		0	6.693	6.69	97.5	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	91	91.0	1,326	
Acenaphthene	0	0		0	17	17.0	248	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	59	59.0	860	
Benzo(a)Anthracene	0	0		0	0.1	0.1	1.46	
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	87,429	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	910	910	13,260	
4-Bromophenyl Phenyl Ether	0	0		0	54	54.0	787	
Butyl Benzyl Phthalate	0	0		0	35	35.0	510	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	160	160	2,331	
1,3-Dichlorobenzene	0	0		0	69	69.0	1,005	
1,4-Dichlorobenzene	0	0		0	150	150	2,186	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	800	800	11,657	
Dimethyl Phthalate	0	0		0	500	500	7,286	
Di-n-Butyl Phthalate	0	0		0	21	21.0	306	
2,4-Dinitrotoluene	0	0		0	320	320	4,663	
2,6-Dinitrotoluene	0	0		0	200	200	2,914	
1,2-Diphenylhydrazine	0	0		0	3	3.0	43.7	
Fluoranthene	0	0		0	40	40.0	583	
Fluorene	0	0		0	N/A	N/A	N/A	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	2	2.0	29.1	
Hexachlorocyclopentadiene	0	0		0	1	1.0	14.6	
Hexachloroethane	0	0		0	12	12.0	175	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	2,100	2,100	30,600	
Naphthalene	0	0		0	43	43.0	627	
Nitrobenzene	0	0		0	810	810	11,803	
n-Nitrosodimethylamine	0	0		0	3,400	3,400	49,543	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	59	59.0	860	
Phenanthrene	0	0		0	1	1.0	14.6	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	26	26.0	379	

☑ ***THH*** CCT (min): ###### 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
Total Dissolved Solids (PWS)	0	0		0	500,000	500,000	N/A	
Chloride (PWS)	0	0		0	250,000	250,000	N/A	
Sulfate (PWS)	0	0		0	250,000	250,000	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	5.6	5.6	81.6	
Total Arsenic	0	0		0	10	10.0	146	
Total Barium	0	0		0	2,400	2,400	34,971	
Total Boron	0	0		0	3,100	3,100	45,171	
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	
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	4	4.0	58.3	
Dissolved Iron	0	0		0	300	300	4,371	
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	1,000	1,000	14,571	
Total Mercury	0	0		0	0.050	0.05	0.73	
Total Nickel	0	0		0	610	610	8,889	
Total Phenols (Phenolics) (PWS)	0	0		0	5	5.0	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	0.24	0.24	3.5	
Total Zinc	0	0		0	N/A	N/A	N/A	
Acrolein	0	0		0	3	3.0	43.7	
Acrylonitrile	0	0		0	N/A	N/A	N/A	
Benzene	0	0		0	N/A	N/A	N/A	
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	1,457	
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	481	
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	991	

Methyl Bromide	0	0		0	100	100.0	1,457	
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	831	
1,2-trans-Dichloroethylene	0	0		0	100	100.0	1,457	
1,1,1-Trichloroethane	0	0		0	10,000	10,000	145,714	
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	437	
2,4-Dichlorophenol	0	0		0	10	10.0	146	
2,4-Dimethylphenol	0	0		0	100	100.0	1,457	
4,6-Dinitro-o-Cresol	0	0		0	2	2.0	29.1	
2,4-Dinitrophenol	0	0		0	10	10.0	146	
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	58,286	
2,4,6-Trichlorophenol	0	0		0	N/A	N/A	N/A	
Acenaphthene	0	0		0	70	70.0	1,020	
Anthracene	0	0		0	300	300	4,371	
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	2,914	
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	
Butyl Benzyl Phthalate	0	0		0	0.1	0.1	1.46	
2-Chloronaphthalene	0	0		0	800	800	11,657	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	1,000	1,000	14,571	
1,3-Dichlorobenzene	0	0		0	7	7.0	102	
1,4-Dichlorobenzene	0	0		0	300	300	4,371	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	600	600	8,743	
Dimethyl Phthalate	0	0		0	2,000	2,000	29,143	
Di-n-Butyl Phthalate	0	0		0	20	20.0	291	
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	291	
Fluorene	0	0		0	50	50.0	729	
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	58.3	
Hexachloroethane	0	0		0	N/A	N/A	N/A	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	34	34.0	495	
Naphthalene	0	0		0	N/A	N/A	N/A	
Nitrobenzene	0	0		0	10	10.0	146	
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	291	
1,2,4-Trichlorobenzene	0	0		0	0.07	0.07	1.02	

☑ ***CRL*** CCT (min): ###### 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
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	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	
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	4.18	
Benzene	0	0		0	0.58	0.58	40.4	
Bromoform	0	0		0	7	7.0	488	
Carbon Tetrachloride	0	0		0	0.4	0.4	27.9	
Chlorobenzene	0	0		0	N/A	N/A	N/A	
Chlorodibromomethane	0	0		0	0.8	0.8	55.8	
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A	
Chloroform	0	0		0	5.7	5.7	397	
Dichlorobromomethane	0	0		0	0.95	0.95	66.2	
1,2-Dichloroethane	0	0		0	9.9	9.9	690	
1,1-Dichloroethylene	0	0		0	N/A	N/A	N/A	
1,2-Dichloropropane	0	0		0	0.9	0.9	62.7	
1,3-Dichloropropylene	0	0		0	0.27	0.27	18.8	
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	1,394	
1,1,2,2-Tetrachloroethane	0	0		0	0.2	0.2	13.9	
Tetrachloroethylene	0	0		0	10	10.0	697	
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	38.3	
Trichloroethylene	0	0		0	0.6	0.6	41.8	
Vinyl Chloride	0	0		0	0.02	0.02	1.39	
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	
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	2.09	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	1.5	1.5	105	
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	0.007	
Benzo(a)Anthracene	0	0		0	0.001	0.001	0.07	
Benzo(a)Pyrene	0	0		0	0.0001	0.0001	0.007	

3,4-Benzofluoranthene	0	0		0	0.001	0.001	0.07	
Benzo(k)Fluoranthene	0	0		0	0.01	0.01	0.7	
Bis(2-Chloroethyl)Ether	0	0		0	0.03	0.03	2.09	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	0.32	0.32	22.3	
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	8.37	
Dibenzo(a,h)Anthrancene	0	0		0	0.0001	0.0001	0.007	
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	3.49	
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	3.49	
2,6-Dinitrotoluene	0	0		0	0.05	0.05	3.49	
1,2-Diphenylhydrazine	0	0		0	0.03	0.03	2.09	
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	0.006	
Hexachlorobutadiene	0	0		0	0.01	0.01	0.7	
Hexachlorocyclopentadiene	0	0		0	N/A	N/A	N/A	
Hexachloroethane	0	0		0	0.1	0.1	6.97	
Indeno(1,2,3-cd)Pyrene	0	0		0	0.001	0.001	0.07	
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	0.049	
n-Nitrosodi-n-Propylamine	0	0		0	0.005	0.005	0.35	
n-Nitrosodiphenylamine	0	0		0	3.3	3.3	230	
Phenanthrene	0	0		0	N/A	N/A	N/A	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	N/A	N/A	N/A	

☑ ***Recommended WQBELs & Monitoring Requirements***

No. Samples/Month: 4

	Mass Limits		*Concentration Limits*						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments