pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0044598**
Facility Type	**Non-Municipal**	APS ID	**14187**
Major / Minor	**Minor**	Authorization ID	**1308221**

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Susquehanna Area Region Airport Authority**	Facility Name	**Harrisburg International Airport**
Applicant Address	1 Terminal Drive Suite 300	Facility Address	1 Terminal Drive Suite 300
	Middletown, PA 17057-5048		Middletown, PA 17057-5048
Applicant Contact	Scott Snoke	Facility Contact	Scott Snoke
Applicant Phone	(717) 948-3900	Facility Phone	(717) 948-3900
Client ID	206361	Site ID	452258
Ch 94 Load Status	Not Overloaded	Municipality	Lower Swatara Township
Connection Status	No Limitations	County	Dauphin
Date Application Received	March 3, 2020	EPA Waived?	Yes
Date Application Accepted	March 16, 2020	If No, Reason	
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 sewage from Susquehanna Area Region Airport Authority (SARAA) sewage treatment plant that serves Harrisburg International Airport and some neighboring facilities. SARAA owns, operates, and maintains the wastewater treatment plant located in Lower Swatara Township, Dauphin County. SARAA is a municipality as defined in section 502(4) of the act 33US.C §1362(4), and thus its treatment works is a POTW as defined in 40 CFR section 403.3(q). The facility has been treated as a non-municipal treatment works in the past permits in error. The treatment plant is designed to provide biological nutrient removal using Sequencing Batch Reactors. The facility discharges to the downstream of a flood dike on Post Run, a tributary of Susquehanna River. A POFU done in February 2005 confirmed an earlier determination that the Susquehanna River was the POFU. However, because the discharge is located within the flood zone of Susquehanna River, dry stream limits were not considered for this discharge. Susquehanna River has been used historically for water quality analysis and will continue to be used for the current permit renewal. Post Run and Susquehanna River are classified for warm water fishes and migratory fishes. The facility has a hydraulic design capacity of 0.35 MGD and organic design capacity of the facility is 875lbs BOD5/day. The existing NPDES permit was issued on August 18, 2015 with an effective date of September 1, 2015 and expiration date of August 31, 2020. The applicant submitted a timely NPDES renewal application to the Department and is currently operating under the terms and conditions in the existing permit under administrative extension provisions pending Department action on the renewal application. A topographic map showing the discharge location is presented in attachment A.

Approve	Deny	Signatures	Date
X		*J. Pascal Kwedza* J. Pascal Kwedza, P.E. / Environmental Engineer	October 14, 2021
X		*Maria D. Bebenek for Daniel W. Martin* Daniel W. Martin, P.E. / Environmental Engineer Manager	October 15, 2021
X		*Maria D. Bebenek* Maria D. Bebenek, P.E./ Program Manager	October 15, 2021

Summary of Review

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

The biosolids treatment system comprises of 2 aerobic digesters. Digested and thickened sludge is hauled out by a license hauler (Klines Services) for further processing.

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.

1.3.0 Changes to the existing permit

- E. Coli monitoring has been added

1.3.1 Existing Limitations and Monitoring Requirements

Discharge Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Monthly Average	Daily Maximum	Minimum	Monthly Average	Weekly Average	Instantaneous Maximum		
Flow (mgd)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
Dissolved Oxygen	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
TSS	XXX	XXX	XXX	30	XXX	60	1/week	24-hr comp
$CBOD_5$	XXX	XXX	XXX	25	XXX	50	1/week	24-hr comp
Total Phosphorus	XXX	XXX	XXX	2.0	XXX	4.0	1/week	24-hr comp
Fecal Coliform (5/1 to 9/30)[(5)]	XXX	XXX	XXX	200	XXX	1,000	1/week	Grab
Fecal Coliform (10/1 to 4/30)	XXX	XXX	XXX	2,000	XXX	10,000	1/week	Grab
UV Transmittance (%)	XXX	XXX	Report	XXX	XXX	XXX	1/day	Metered

Summary of Review

1.3.2 Chesapeake Bay Permit Requirements

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	1/week	24-hr Comp
Kjeldahl---N	Report	XXX	XXX	Report	XXX	1/week	8-hr Comp
Nitrate-Nitrite as N	Report	XXX	XXX	Report	XXX	1/week	8-hr Comp
Total Nitrogen	Report	Report	XXX	Report	XXX	1/month	Calculate
Total Phosphorus	Report	Report	XXX	Report	XXX	1/week	24-hr Comp
Net Total Nitrogen	Report	7306	XXX	XXX	XXX	1/month	Calculate
Net Total Phos.	Report	974	XXX	XXX	XXX	1/month	Calculate

1.4.0 Discharge, Receiving Waters and Water Supply Information

Outfall No.	001 Discharge	Design Flow (MGD)	0.35
Latitude	40° 11’ 17.00”	Longitude	76° 44’ 44.00”
Quad Name	Middletown	Quad Code	1732
Wastewater Description:	Treated sewage		
Receiving Waters	Unnamed Tributary to Susquehanna River (Post Run)	Stream Code	10088
NHD Com ID	133783838	RMI	0.15
Drainage Area	1.5	Yield (cfs/mi^2)	0.133
Q_{7-10} Flow (cfs)	0.20	Q_{7-10} Basis	USGS 01570500
Elevation (ft)		Slope (ft/ft)	
Watershed No.	7-C	Chapter 93 Class.	WWF, MF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	Siltation, Other Habitat Alterations		
Source(s) of Impairment	Urban Runoff/Storm Sewers		
TMDL Status	Pending	Name	

Background/Ambient Data		Data Source
pH (SU)	8.2	WQN202 July-Sept median
Temperature (°F)	23.50	WQN202 July-Sept median
Hardness (mg/L)	115	WQN202 July-Oct average
Other:		

Nearest Downstream Public Water Supply Intake		Colombia Water Company	
PWS Waters	Susquehanna River	Flow at Intake (cfs)	32.71
PWS RMI		Distance from Outfall (mi)	18

Changes Since Last Permit Issuance: None

1.4.1 Discharge, Secondary Receiving Waters and Water Supply Information

Outfall No.	001 POFU	Design Flow (MGD)	0.35
Latitude	40° 11' 8"	Longitude	76° 44' 46"
Quad Name	Middletown	Quad Code	1732
Wastewater Description:	Sewage		
Secondary Receiving Waters	Susquehanna River	Stream Code	06685
NHD Com ID		RMI	62.88
Drainage Area	24,281.5 mi	Yield (cfs/mi^2)	0.133
Q_{7-10} Flow (cfs)	3229.4	Q_{7-10} Basis	USGS Gage Station
Elevation (ft)	275.10	Slope (ft/ft)	
Watershed No.	7-C	Chapter 93 Class.	WWF, MF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	pH, PCB		
Source(s) of Impairment	unknown		
TMDL Status	Pending	Name	

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

Nearest Downstream Public Water Supply Intake	Colombia Water Company		
PWS Waters	Susquehanna river	Flow at Intake (cfs)	
PWS RMI		Distance from Outfall (mi)	<18

1.4.2 Water Supply Intake

The nearest downstream water supply intake is approximately 18 miles downstream by Colombia Water Company on Susquehanna River in York County. Due to the distance and dilution, no impact is expected from this discharge.

2.0 Treatment Facility Summary

Treatment Facility Name: Harrisburg Airport STP

WQM Permit No.	Issuance Date
2207403	02/28/2008

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Tertiary	Sequencing Batch Reactor W/Sol Removal	Ultraviolet	0.35

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.35	875	Not Overloaded		Other WWTP

Changes Since Last Permit Issuance: None

2.1 Treatment Facility Description

The facility consists of main pump station, mechanical fine screen, grit removal unit, 2 SBR reactors, 2 UV units, 2 aerobic digesters, and a post aeration tank with pumps to pump to UV.

2.2 Chemicals

Delpac for phosphorus precipitation.
Micro C and Sugar as carbon source for biological nutrient removal

3.0 Compliance History

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

Parameter	AUG-21	JUL-21	JUN-21	MAY-21	APR-21	MAR-21	FEB-21	JAN-21	DEC-20	NOV-20	OCT-20	SEP-20
Flow (MGD) Average Monthly	0.099	0.084	0.077	0.072	0.073	0.079	0.057	0.049	0.043	0.039	0.045	0.045
Flow (MGD) Daily Maximum	0.145	0.143	0.144	0.133	0.115	0.125	0.106	0.114	0.091	0.068	0.086	0.092
pH (S.U.) Minimum	7.5	7.6	7.5	7.2	7.2	7.1	7.2	6.9	7.1	7.1	7.3	7.6
pH (S.U.) Maximum	8.2	8.4	8.2	7.6	7.4	7.5	7.7	7.3	7.3	7.4	8.1	8.0
DO (mg/L) Minimum	6.5	6.4	6.1	5.8	7.4	6.6	8.3	7.9	8.7	7.5	6.5	7.3
CBOD5 (mg/L) Average Monthly	2.9	2.6	3.5	< 2.4	< 2.9	< 2.8	< 3.9	< 2.3	< 2.3	< 2.0	< 2.0	< 2.4
TSS (mg/L) Average Monthly	6.3	8.8	6.7	6.3	7.5	5.8	10.0	9.8	11.0	8.8	9.0	5.2
Fecal Coliform (CFU/100 ml) Geometric Mean	< 1	< 1	< 1	< 1	< 1	< 3	< 8	< 6	138	5	< 1	< 1
Fecal Coliform (CFU/100 ml) Instant. Maximum	1	< 1	< 1	< 1	< 1	250	360	47	280	132	1	< 1
UV Transmittance (%) Minimum	100	100	100	100	100	100	100	100	100	100	100	100
Nitrate-Nitrite (mg/L) Average Monthly	17.4	16.9	15.84	12.2	7.87	< 1.93	< 4.7	24.6	24.8	21.1	19.4	22.0
Nitrate-Nitrite (lbs) Total Monthly	491.8	459.6	295.2	294.2	159	< 44.5	< 70.5	364.5	214	211	273.3	353
Total Nitrogen (mg/L) Average Monthly	< 18.37	< 17.98	< 16.84	< 13.3	9.55	< 3.65	< 8.4	< 27.4	< 25.8	< 22.1	< 20.6	< 23.1
Total Nitrogen (lbs) Effluent Net Total Monthly	< 519.6	< 488.6	< 313.7	< 320.4	192.1	< 83.3	< 128.2	< 420.8	< 222.6	< 221.4	< 292.3	< 370.4
Total Nitrogen (lbs) Total Monthly	< 519.6	< 488.6	< 313.7	< 320.4	192.1	< 83.3	< 128.2	< 420.8	< 222.6	< 221.4	< 292.3	< 370.4
Total Nitrogen (lbs) Effluent Net Total Annual												< 2580
Total Nitrogen (lbs) Total Annual												< 2580

Ammonia (mg/L) Average Monthly	< 0.119	< 0.1	< 0.1	< 0.2	< 0.231	< 1.00	2.96	< 2.4	< 0.164	< 0.1	< 0.177	< 0.1
Ammonia (lbs) Total Monthly	< 3.6	< 2.7	< 1.9	< 4.6	< 4.4	< 21.9	45.1	< 51.9	< 1.5	< 1	< 3	< 1.6
Ammonia (lbs) Total Annual												< 59
TKN (mg/L) Average Monthly	< 0.97	< 1.1	< 1.0	< 1.1	1.7	< 1.7	3.2	< 2.4	< 1	< 1	< 1.2	< 1.1
TKN (lbs) Total Monthly	< 27.8	< 28.9	< 18.6	< 26.2	33.2	< 38.8	50.9	< 48	< 8.6	< 9.9	< 19	< 17.4
Total Phosphorus (mg/L) Average Monthly	0.86	0.90	0.58	0.35	0.24	< 0.13	0.22	0.61	1.9	0.51	0.53	0.66
Total Phosphorus (lbs) Effluent Net Total Monthly	24.3	24.4	10.5	8.1	4.8	< 3	3.8	< 27.4	17.9	5.1	7.8	10.7
Total Phosphorus (lbs) Total Monthly	24.3	24.4	10.5	8.1	4.8	< 3	3.8	9.2	17.9	5.1	< 7.8	10.7
Total Phosphorus (lbs) Effluent Net Total Annual												< 66
Total Phosphorus (lbs) Total Annual												66

3.2 Summary of Discharge Monitoring Reports (DMRs)**:**

DMRs review for the facility for the last 12 months of operation, presented on the table above in section 3.1 indicate permit limits have been met consistently. No effluent violations noted on DMRs during the period reviewed.

3.3 Summary of Inspections:

The facility has been inspected a couple times during last permit cycle. A notice of violation (NOV) was sent on February 16, 2018 for TSS and CBOD5 violations noted during plant inspection on January 25, 2018. Response to the NOV indicates the violation was due to plant upset from illicit discharge from an industrial user. The violation and delay in reporting and correcting the violation led to a consent assessment of civil penalty on September 15, 2020. As a corrective action, SARAA proposed implementing a sampling program for industrial users.

4.0 Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** .35
Latitude 40º 11' 17.00" **Longitude** -76º 44' 44.00"
Wastewater Description: Sewage Effluent

4.1 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.

4.2 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)
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)

Comments: TRC limitation not applicable.

4.3 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

4.4.0 Water Quality-Based Limitations

4.4.1 Streamflow:

Streamflows for the water quality analysis were determined by correlating with the yield of USGS gauging station No. 01570500 on Susquehanna River in Harrisburg. The $Q_{7\text{-}10}$ and drainage area at the gage is 3200 ft^3/s and 24100mi^2 respectively. The resulting yields are as follows:

- $Q_{7\text{-}10}$ = (3200 ft^3/s)/ 24100 mi^2 = 0.133 $ft^3/s/ mi^2$
- $Q_{30\text{-}10}$ / $Q_{7\text{-}10}$ = 1.15
- $Q_{1\text{-}10}$ / $Q_{7\text{-}10}$ = 0.94

The drainage area at POFU = 24281.5 mi^2

The Q_{7-10} at POFU = 24281.5 mi^2 x 0.133 $ft^3/s/mi^2$ = 3229.4ft^3/s.

For WQM 7.0 modelling purposes, 25% of the flow will be used

Q_{7-10} model = 3229.4 ft^3/s. x 0.25 = 807.35 ft^3/s

4.4.2 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 = 7.5 (July -Sept DMR median)
* Discharge Temperature = 25 ° C (Default)
* Stream pH = 8.2 (Taken from WQN station at Harrisburg)
* Stream Temperature = 23.5°C (Taken from WQN station at Harrisburg)
* Background NH_3-N = 0.0 (default)

4.4.3 $CBOD_5$

Due to the proximity of this discharge and the Airports IW discharge and Middletown Borough's discharge, they were modeled together. The attached results of the WQM 7.0 stream model indicate that an average monthly limit (AML) of 25 mg/l **$CBOD_5$ is** adequate to protect the water quality of the stream for the Airport's STP discharge. The results did not reveal any apparent interaction between the discharges. The recommended average monthly limit of 25 mg/l and instantaneous maximum limit of 50 mg/l are consistent with the existing permits and will remain in the permit. In addition, average weekly limit (AWL) of 40mg/l will be added to the permit as in done for municipal facilities with monitoring frequency of at least 1/week. Past DMRs and inspection reports show the facility can meet the limits. Mass-based limits are calculated based on the equation presented in section 4.3.

4.4.4 NH_3-N

The attached results of the WQM 7.0 stream model indicates also that no limitation on NH_3 -N as a monthly average is necessary to protect the aquatic life from toxicity effects. However, existing weekly monitoring of NH_3 -N will remain in the permit to ensure treatment efficiency.

4.4.5 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 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.

4.4.6 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 (%) is required in the permit to ensure efficiency of the UV unit.

4.4.7 Total Suspended Solids (TSS):

There is no water quality criterion for TSS. A limit of 30 mg/l AML in the existing permit which was 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

remain in the permit. In addition, an AWL of 45mg/l per 40CFR 133.102(b)(2) and 25 PA § 92a.47(a)(2) is added to the permit. Mass-based limits are calculated based on the equation presented in section 4.3.

4.4.8 Toxics

A reasonable potential (RP) was done for pollutants sampled in support of the permit renewal 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 results of 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.

The recommended limitations follow the logic presented in DEPs SOP, to establish limits in the permit where the maximum reported concentration exceeds 50% of the WQBEL, or for non-conservative pollutants to establish monitoring requirements where the maximum reported concentration is between 25% - 50% of the WQBEL, or to establish monitoring requirements for conservative pollutants where the maximum reported concentration is between 10% - 50% of the WQBEL.

4.4.9 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 Chesapeake Bay(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 received annual loading caps based on their design flow of August 29, 2005 and concentrations of 6 mg/l TN and 0.8 mg/l TP. These limits may be achieved through a combination of treatment technology, credits, or offsets. Phase 4 (0.2 -0.4mgd) and Phase 5(below 0.2mdg) will be required to monitor and report TN and TP during permit renewals. Any facility in Phases 4 and 5 that undergoes expansion is subjected to cap load at the time of expansion.

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 expanded from 0.15MGD to 0.35MGD and received Bay cap loads based on the strategy at that time of using the lesser of the ceiling cap of TN of 6 mg/l (7,306 lbs) and TP of 0.8 mg/l (974 lbs.) at 0.50 MGD or existing performance (22 mg/l TN and 4 mg/l TP at design flow of 0.15 MGD) resulting in a cap of 10,045 lbs. TN and 1,461 lbs. TP. The permit was issued with the ceiling caps for TN of 7,306 lbs and TP of 974 lbs. which remain applicable. The permittee is in compliance with the Bay Capload.

4.4.10 Phosphorus:

The limit of 2 mg/l established in the existing permit was for the protection of the Lower Susquehanna River basin. This approach has been superseded by the Chesapeake Bay Strategy but will remain in the permit due to anti-backsliding. This STP was designed to remove phosphorus and contains phosphorus limits in all previous permits. Past DMRs and inspection reports show that the STP is in compliance with the phosphorus effluent limits.

4.3.11 Influent BOD and TSS Monitoring

The permit will require influent BOD5 and TSS monitoring at the same frequency as is done for effluent in order to implement Chapter 94.12 and assess percent removal requirements effectively.

4.4.12 Industrial Users

SARAA's treatment works receives industrial wastewater from Librandi metal fishing facility. The facility is a significant industrial user.

4.4.13 Pretreatment Requirements

The design annual average flow of the treatment plant is 0.35MGD but receives flow from an industrial user subject to new source pretreatment standards for metal finishing facilities. Per 40 CFR section 403.8(a), development and implementation of pretreatment program is required for POTWs that receives industrial wastewater from industrial users subject to pretreatment standards. SARAA currently has no EPA-approved pretreatment program. The permit will include condition in Part C.II of the permit requiring SARAA to develop a pretreatment program for approval by EPA and to implement the approved pretreatment program

4.3.14 Stormwater

No stormwater outfall is associated with this facility.

4.4.15 Fecal Coliform and E. Coli

The existing Fecal Coliform limit is consistent with the technology limits recommended in 92a.47(a)(4) and (a)(5) and will remain in the permit. Quarterly monitoring of E. Coli is required in the permit following DEP recommendation of 1/quarter monitoring of E. Coli at a minimum for this type of facility.

5.0 Other Requirements

5.1 Anti-backsliding

Not applicable to this permit

5.2 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.

5.3 Class A Wild Trout Fisheries

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

5.4 303d Listed Streams

The discharge is located on a 303d listed stream segment. Susquehanna River is impaired for fish consumption by PCB and aquatic life by pH. The sources of the impairments are unknown. Post Run is supporting uses according to eMapPA. This discharge does not contribute to these impairments; therefore, no action is warranted at this time.

5.5 Special Permit Conditions

The permit contains the following special conditions:

- Stormwater Prohibition, Approval Contingencies, Solids Management, Restriction on receipt of hauled in waste under certain conditions, and requirement for pretreatment program development and implementation.

5.6 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).

5.7 Effluent Monitoring Frequency

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.

6.0 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 Inst Min	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
CBOD5	73.0	117	XXX	25.0	40.00	50	1/week	24-Hr Composite
Biochemical Oxygen Demand (BOD5) Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Total Suspended Solids	88.0	131	XXX	30.0	45.0	60	1/week	24-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	1/week	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/week	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/quarter	Grab
UV Transmittance (%)	XXX	XXX	Report	XXX	XXX	XXX	1/day	Metered
Nitrate-Nitrite	XXX	XXX	XXX	Report	XXX	XXX	1/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

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) Effluent Net	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
Total Nitrogen (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
Ammonia	XXX	XXX	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Ammonia (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
TKN	XXX	XXX	XXX	Report	XXX	XXX	1/week	24-Hr Composite
TKN (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
Total Phosphorus	6.0	XXX	XXX	2.0	XXX	4	1/week	24-Hr Composite
Total Phosphorus (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
Total Phosphorus (lbs) Effluent Net	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation

Compliance Sampling Location: outfall 001

6.1 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.

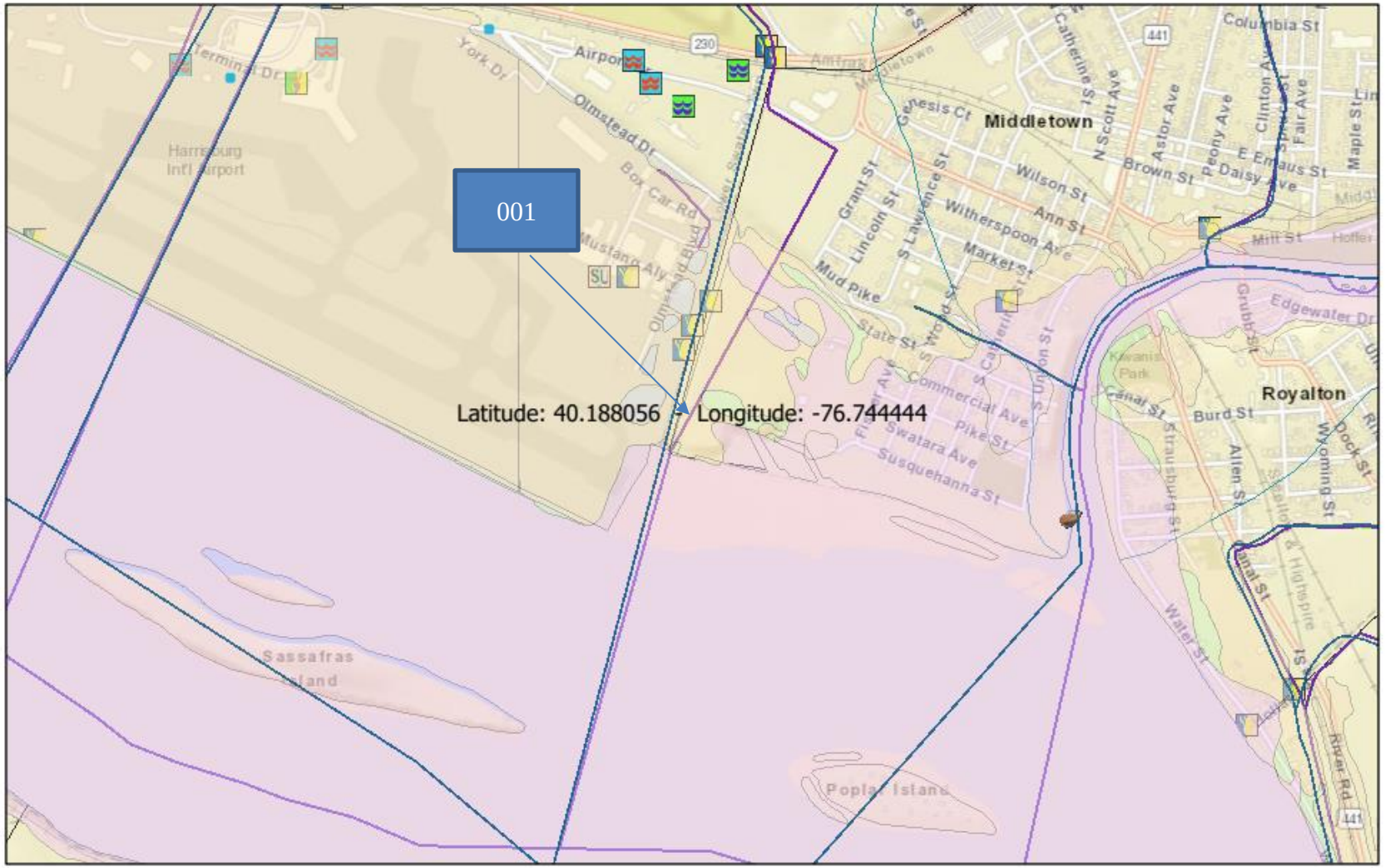
Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) [1]		Concentrations (mg/L)				Minimum [2] Measurement Frequency	Required Sample Type
	Monthly	Annual	Monthly	Monthly Average	Maximum	Instant. Maximum		
Total Nitrogen (lbs) Effluent Net	XXX	7306 Total Annual	XXX	XXX	XXX	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	974 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: 001

7.0 Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment B)
☒	Toxics Management Spreadsheet (see Attachment C)
☐	TRC Model Spreadsheet (see Attachment)
☐	Temperature Model Spreadsheet (see Attachment)
☒	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 limitations for individual NPDES sewage permit
☐	Other:

8.0 Attachments

A. Topographical Map



B. WQM Model Results

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
07K	6685	SUSQUEHANNA 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)
63.180	Hbg Aiport IW	PA0082244	0.046	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			5

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
62.880	Hbg Airport STP	PA0044598	0.350	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			5

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
61.400	Middletown Boro	PA0020660	2.200	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			5

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
07K	6685	SUSQUEHANNA RIVER	63.180	276.00	24281.00	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	0.133	0.00	807.34	0.000	0.000	0.0	0.00	0.00	23.50	8.20	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
Hbg Aiport IW	PA0082244	0.0460	0.0460	0.0460	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	2.00	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
07K	6685	SUSQUEHANNA RIVER	**62.880**	275.10	24281.50	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	0.133	0.00	807.35	0.000	0.000	0.0	0.00	0.00	23.50	8.20	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
Hbg Airport STP	PA0044598	0.3500	0.3500	0.3500	0.000	25.00	7.50

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
07K	6685	SUSQUEHANNA RIVER	**61.400**	274.40	24282.00	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	0.133	0.00	807.38	0.000	0.000	0.0	0.00	0.00	23.50	8.20	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
Middletown Boro	PA0020660	2.2000	2.2000	0.0000	0.000	25.00	7.40

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
07K	6685	SUSQUEHANNA RIVER	**59.000**	270.00	24966.00	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	0.133	0.00	830.12	0.000	0.000	0.0	0.00	0.00	23.50	8.20	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
Exelon TMI	PA000992	0.0000	43.0000	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	2.00	0.00	1.50
Dissolved Oxygen	3.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
07K	6685	SUSQUEHANNA RIVER

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												
63.180	807.34	0.00	807.34	.0712	0.00057	1.224	663.64	542.2	0.99	0.018	23.50	8.20
62.880	807.35	0.00	807.35	.6126	0.00009	1.266	710.24	560.85	0.90	0.101	23.50	8.20
61.400	807.38	0.00	807.38	4.016	0.00035	1.23	680.03	552.9	0.97	0.151	23.51	8.19
Q1-10 Flow												
63.180	758.90	0.00	758.90	.0712	0.00057	NA	NA	NA	0.96	0.019	23.50	8.20
62.880	758.91	0.00	758.91	.6126	0.00009	NA	NA	NA	0.87	0.104	23.50	8.20
61.400	758.94	0.00	758.94	4.016	0.00035	NA	NA	NA	0.94	0.156	23.51	8.19
Q30-10 Flow												
63.180	928.44	0.00	928.44	.0712	0.00057	NA	NA	NA	1.07	0.017	23.50	8.20
62.880	928.45	0.00	928.45	.6126	0.00009	NA	NA	NA	0.97	0.093	23.50	8.20
61.400	928.49	0.00	928.49	4.016	0.00035	NA	NA	NA	1.05	0.140	23.51	8.19

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	0.94	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.15	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	5		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
07K	6685	SUSQUEHANNA 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
63.180	Hbg Aiport IW	1.99	50	1.99	50	0	0
62.880	Hbg Airport STP	1.99	50	2	50	0	0
61.400	Middletown Boro	2.03	50	2.04	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
63.180	Hbg Aiport IW	.46	25	.46	25	0	0
62.880	Hbg Airport STP	.46	25	.46	25	0	0
61.400	Middletown Boro	.46	25	.46	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)		
63.18	Hbg Aiport IW	25	25	25	25	5	5	0	0
62.88	Hbg Airport STP	25	25	25	25	5	5	0	0
61.40	Middletown Boro	25	25	25	25	5	5	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
07K	6685	SUSQUEHANNA RIVER

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
63.180	0.046	23.500	8.199
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
663.639	1.224	542.199	0.994
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.00	0.002	0.00	0.916
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
8.243	2.862	Tsivoglou	5
Reach Travel Time (days)			
0.018			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.002	2.00	0.00	7.74
0.004	2.00	0.00	7.74
0.006	2.00	0.00	7.74
0.007	2.00	0.00	7.74
0.009	2.00	0.00	7.74
0.011	2.00	0.00	7.74
0.013	2.00	0.00	7.74
0.015	2.00	0.00	7.74
0.017	2.00	0.00	7.74
0.018	2.00	0.00	7.74

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
62.880	0.396	23.501	8.198
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
710.236	1.266	560.846	0.898
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.02	0.013	0.02	0.916
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.735	0.408	Tsivoglou	5
Reach Travel Time (days)			
0.101			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.010	2.02	0.02	7.74
0.020	2.02	0.02	7.74
0.030	2.02	0.02	7.74
0.040	2.02	0.02	7.74
0.050	2.02	0.02	7.74
0.060	2.02	0.02	7.74
0.070	2.02	0.02	7.74
0.081	2.01	0.02	7.74
0.091	2.01	0.02	7.74
0.101	2.01	0.02	7.74

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
07K	6685	SUSQUEHANNA RIVER

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
61.400	2.596	23.507	8.189
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
680.032	1.230	552.900	0.970
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.11	0.076	0.12	0.917
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.725	1.707	Tsivoglou	5
Reach Travel Time (days)			
0.151			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.015	2.11	0.12	7.74
0.030	2.11	0.12	7.74
0.045	2.10	0.12	7.74
0.060	2.10	0.12	7.74
0.076	2.10	0.11	7.74
0.091	2.09	0.11	7.74
0.106	2.09	0.11	7.74
0.121	2.09	0.11	7.74
0.136	2.09	0.11	7.74
0.151	2.08	0.11	7.74

C. Toxic Management Spreadsheet (TMS)

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.3, March 2021

Discharge Information

Instructions | Discharge | Stream

Facility: **Harrisburg Airport STP** NPDES Permit No.: **PA0044598** 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
0.35	100	7.5						

					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	Stream CV	Fate Coeff	FOS	Criteria Mod	Chem Transl
Group 1	Total Dissolved Solids (PWS)	mg/L		1510									
	Chloride (PWS)	mg/L		289									
	Bromide	mg/L		0.6									
	Sulfate (PWS)	mg/L		487									
	Fluoride (PWS)	mg/L											
Group 2	Total Aluminum	µg/L											
	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		380									
	Hexavalent Chromium	µg/L											
	Total Cobalt	µg/L											
	Total Copper	µg/L		14									
	Free Cyanide	µg/L											
	Total Cyanide	µg/L											
	Dissolved Iron	µg/L											
	Total Iron	µg/L											
	Total Lead	µg/L		1									
	Total Manganese	µg/L											
	Total Mercury	µg/L											
	Total Nickel	µg/L		370									
	Total Phenols (Phenolics) (PWS)	µg/L											
	Total Selenium	µg/L											
	Total Silver	µg/L											
	Total Thallium	µg/L											
	Total Zinc	µg/L		62									
	Total Molybdenum	µg/L											
	Acrolein	µg/L	<										
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<										
	Benzene	µg/L	<										
	Bromoform	µg/L	<										

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Toxics Management Spreadsheet
Version 1.3, March 2021

Stream / Surface Water Information

Harrisburg Airport STP, NPDES Permit No. PA0044598, Outfall 001

Instructions | Discharge | Stream

Receiving Surface Water Name: **Susquehanna River**

No. Reaches to Model: 1

(●) Statewide Criteria
( ) Great Lakes Criteria
( ) ORSANCO Criteria

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi²)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	006685	62.88	275.1	24281.5			Yes
End of Reach 1	006685	61.4	274.4	242842			Yes

Q_{7-10}

Location	RMI	LFY (cfs/mi²)*	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	62.88	0.133	807.35									100	8.2		
End of Reach 1	61.4	0.133	807.38												

Q_h

Location	RMI	LFY (cfs/mi²)	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	62.88														
End of Reach 1	61.4														

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Toxics Management Spreadsheet
Version 1.3, March 2021

Model Results

Harrisburg Airport STP, NPDES Permit No. PA0044598, Outfall 001

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

☑ ***Hydrodynamics***

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

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)
62.88	807.35		807.35	0.541	0.00009	1.266	710.198	560.807	0.898	0.101	51186.373
61.4	807.38		807.38								

Q_h

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)
62.88	2580.84		2580.84	0.541	0.00009	2.111	710.198	336.383	1.722	0.053	23800.449
61.4	2580.923		2580.92								

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 15 PMF: 0.017 Analysis Hardness (mg/l): 100 Analysis pH: 8.14

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 Chromium (III)	0	0		0	569.763	1,803	47,827	Chem Translator of 0.316 applied
Total Copper	0	0		0	13.439	14.0	371	Chem Translator of 0.96 applied
Total Lead	0	0		0	64.581	81.6	2,166	Chem Translator of 0.791 applied
Total Nickel	0	0		0	468.236	469	12,445	Chem Translator of 0.998 applied
Total Zinc	0	0		0	117.180	120	3,178	Chem Translator of 0.978 applied

☑ ***CFC*** CCT (min): 720 PMF: 0.119 Analysis Hardness (mg/l): 100 Analysis pH: 8.19

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 Chromium (III)	0	0		0	74.115	86.2	15,327	Chem Translator of 0.86 applied
Total Copper	0	0		0	8.956	9.33	1,659	Chem Translator of 0.96 applied
Total Lead	0	0		0	2.517	3.18	566	Chem Translator of 0.791 applied
Total Nickel	0	0		0	52.007	52.2	9,277	Chem Translator of 0.997 applied
Total Zinc	0	0		0	118.139	120	21,309	Chem Translator of 0.986 applied

☑ ***THH*** CCT (min): 720 PMF: 0.119 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (ug/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 Chromium (III)	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Nickel	0	0		0	610	610	108,485	
Total Zinc	0	0		0	N/A	N/A	N/A	

☑ ***CRL*** CCT (min): 720 PMF: 0.174 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (ug/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 Chromium (III)	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Nickel	0	0		0	N/A	N/A	N/A	
Total Zinc	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