pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

Application Type **Renewal** / **Non-**

NPDES PERMIT FACT SHEET

Application No. **PA0088021**

Facility Type **Municipal**

INDIVIDUAL SEWAGE

APS ID **1002768**

Major / Minor **Minor**

Authorization ID **1422677**

Applicant and Facility Information

Applicant Name	**Station Pass, LLC**	Facility Name	**Blue Heron Village STP**
Applicant Address	183 Christman Road	Facility Address	183 Christman Road
	Lenhartsville, PA 19534-9271		Lenhartsville, PA 19534-9271
Applicant Contact	Ivan Zimmerman	Facility Contact	Kenneth Fulford
Applicant Phone	(610) 587-1085	Facility Phone	(610) 216-0150
Client ID	352690	Site ID	503331
Ch 94 Load Status	Not Overloaded	Municipality	Windsor Township
Connection Status	No Limitations	County	Berks
Date Application Received	January 1, 2023	EPA Waived?	No
Date Application Accepted	January 17, 2023	If No, Reason	Discharge to TMDL Water. WLA

Purpose of Application: Renewal of Existing NPDES Permit

Summary of Review

Station Pass, LLC has applied to the Pennsylvania Department of Environmental Protection (DEP) for reissuance of its NPDES permit. The permit was last reissued on June 29, 2018 and became effective on July 1, 2018, as Amendment 1. The permit expired on June 30, 2023, but the terms and conditions of the permit have been administratively extended since that time. Amendment 1 was issued in conjunction with a Permit Transfer from the prior permittee, Susan Christman. This renewal will be drafted to incorporate changes associated with revisions to the NPDES standard form, Rev. 8/2021.

The purpose of this Fact Sheet is to present the basis of information used for establishing the proposed NPDES permit effluent limitations. The Fact Sheet includes the following information:

1. A description of the facility
2. Type and Quantity of Wastewater or Pollutants Evaluated in the Permit
3. Facility NPDES Compliance History
4. Receiving Waters and Water Supply Information Detail Summary
5. Development of Effluent Limitations and Monitoring Requirements
6. NPDES Parameter Details

The applicant disclosed the Act 14 requirement to the County of Berks, and Windsor Township. The notice was received by the County of Berks on December 29, 2022, and by Windsor Township on December 27, 2022. A planning approval letter was not necessary as the facility is neither new or expanding.

Based on the review in this report, it is recommended that the permit be drafted. The proposed permit will expire five (5) years from the effective date.

Approve	Deny	Signatures	Date
X		***Steven C. Roselle*** Steven C. Roselle, P.E. / Environmental Engineer	March 25, 2024
x		***Maria D. Bebenek for*** Daniel W. Martin, P.E. / Environmental Engineer Manager	April 17, 2024
x		***Maria D. Bebenek*** Maria D. Bebenek, P.E. / Program Manager	April 17, 2024

Summary of Review

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.

Any additional information or public review of documents associated with the discharge or facility may be available at PA DEP Southcentral Regional Office (SCRO), 909 Elmerton Avenue, Harrisburg, PA 17110. To make an appointment for file review, contact the SCRO File Review Coordinator at 717.705.4700.

Because the receiving water is within the Delaware River watershed, a copy of the draft permit and fact sheet will be forwarded to the Delaware River Basin Commission in compliance with state regulations and our interagency agreement. There was no DRBC docket included in our Files or shown on the DRBC's website but older dockets do not show up on the DRBC's online map. (Note: The DRBC considers facilities discharging $\geq$ 0.050 MGD to a receiving stream within the DE River watershed or $\geq$ 0.010 MGD in its designated Special Protection Waters "reviewable projects".)

1. Description of the Facility

1.1 Site location

A topographical and an aerial photograph of the facility are depicted as Figure 1 and Figure 2.

Figure 1: Topographical map of the subject facility

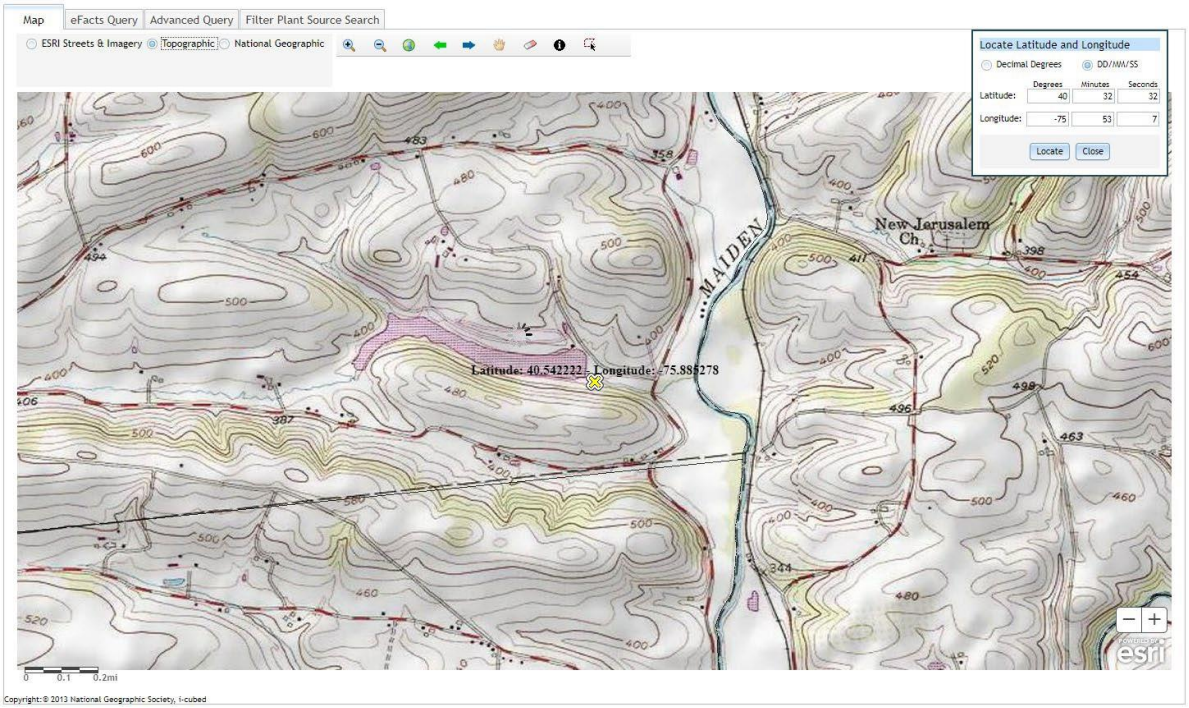
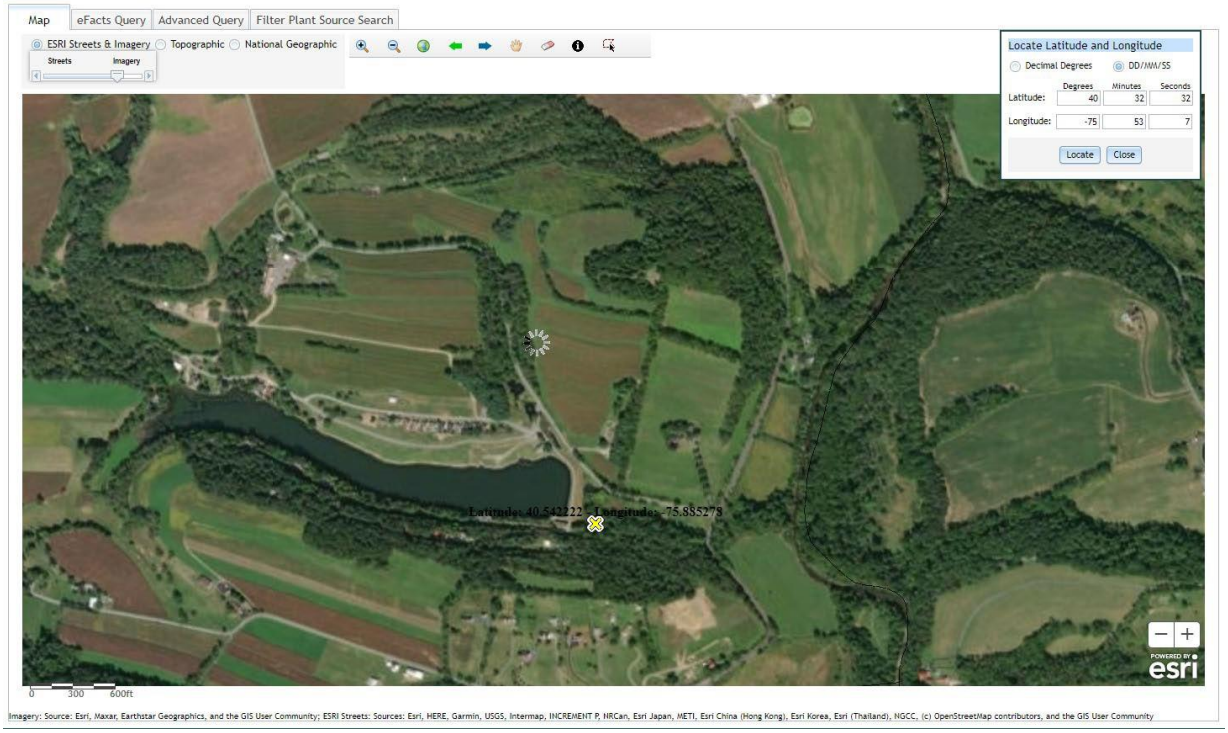


Figure 2: Aerial Photograph of the subject facility



1.2 Description of Exiting Wastewater Treatment Process

Station Pass, LLC owns and operates the Blue Heron Village Wastewater Treatment Facility (WWTF) in Windsor Township, Berks County. The facility serves the entirety of Blue Heron Village in Windsor Township. All wastes are residential in nature. With having both annual average design flow and hydraulic design capacity of 0.0785 MGD, this facility consists of: two (2) sequencing batch reactors (SBR's), aerobic digestion, chlorine disinfection, dechlorination, phosphorus removal, a low-pressure collection system with grinder pumps, and the outfall (i.e., Outfall 001). A sodium hypochlorite solution is used for disinfection, a sodium bisulfate solution is used for dechlorination, and aluminum hydroxychloride is used for phosphorus removal. The maximum usage rate for each of these chemicals is reported to be 0.5 gpd. No other chemicals are reported to be in use at the WWTF.

Treatment Facility Summary

Treatment Facility Name: Blue Heron Village Wastewater Treatment Facility (formerly Christman Lake STP)

WQM Permit No.	Issuance Date	Transfer Date
0699410 T-1	March 21, 2000	May 12, 2020

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary	Sequencing Batch Reactor	Hypochlorite	0.0785

Hydraulic Capacity (MGD)	Organic Capacity (lbs BOD/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.0785	164	Not Overloaded	Aerobic Digestion	Other WWTP

2. Type and Quantity of Wastewater or Pollutants Evaluated in the Permit

2.1 Existing Permit Requirements

The facility has the following Effluent Limitations, Monitoring, Recordkeeping and Reporting Requirements:

For Outfall 001 , **Latitude** 40° 32' 32" , **Longitude** 75° 53' 7" , **River Mile Index** 0.33 , **Stream Code** 02067

Receiving Waters: Unnamed Tributary to Maiden Creek (TSF)

Type of Effluent: Sewage Effluent

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Instant. Minimum	Average Monthly		Instant. 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
DO	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.32	XXX	1.05	1/day	Grab
CBOD5	XXX	XXX	XXX	25.0	XXX	50	2/month	8-Hr Composite
TSS	Report	XXX	XXX	30.0	XXX	60	2/month	8-Hr Composite
Total Suspended Solids (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
Total Suspended Solids (lbs)	XXX	7168 Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation
Total Dissolved Solids	XXX	XXX	XXX	Report	XXX	XXX	1/month	8-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/month	Grab
Total Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	1/month	8-Hr Composite
Ammonia Nov 1 - Apr 30	XXX	XXX	XXX	14.7	XXX	29	2/month	8-Hr Composite
Ammonia May 1 - Oct 31	XXX	XXX	XXX	4.9	XXX	9.8	2/month	8-Hr Composite

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Instant. Minimum	Average Monthly		Instant. Maximum		
Total Phosphorus	Report	XXX	XXX	2.0	XXX	XXX	2/month	8-Hr Composite
Total Phosphorus (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
Total Phosphorus (lbs)	XXX	239 Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation

3. Facility NPDES Compliance History

3.1 Summary of Inspections

A summary of inspections during the existing permit review cycle follows.

Inspection Summary
10/08/2019: Gary Moyer, DEP, conducted an administrative inspection. A violation was identified – NPDES - Failure to pay annual fee. This item was resolved on 10/31/2019. **09/02/2020**: Tami Opila, DEP, conducted an administrative/file review inspection. A violation was identified - Failure to submit annual system fee. This item was resolved on 09/09/2020. **10/06/2020**: Tracy Tomtishen, DEP Water Quality Specialist, conducted an administrative inspection to discuss recent effluent violations and corrective actions. Kenneth L. Fulford (Operator in Charge) was contacted. Violations for Fecal Coliform (IMAX), Fecal Coliform (Geometric Mean), and TSS (Average Monthly) occurred between February 2019 and August 2020. Mr. Fulford noted that violations were due to plant being designed for 300 mobile home units and currently having only 30-40 units. Since there is very low flow, SBR #2 remains offline and plant discharges approximately once every other day. Mr. Fulford explained the treatment plant is designed as a continuous SBR and he believes that influent entering the SBR during decant is stirring up the basin's contents and resulting in TSS and Fecal Coliform violations. Mr. Fulford has instructed the daily operator to begin loading SBR#2 during decant of SBR#1. SBR#2 will act as an EQ tank and will be aerated. Once SBR#1 is finished decanting and is in "fill" stage, the contents of SBR#2 will be pumped (with a trash pump or sludge pump) back into SBR#1. Mr. Fulford also explained that it is a low-pressure collection system and there is no way to control influent flow besides directing it to the other basin. Operators did not yet begin this process control change and are expected to start Wednesday (10/7/2020).

3.2 Summary of Non-Compliances

A summary of non-compliances during the existing permit review cycle follows.

Parameter	Occurrence	SBC	DMR Value	Units	Limit	Units
Fecal Coliform	Feb. 2019	IMAX	20000	No./100 ml	10000	No./100 ml
Fecal Coliform	Jun. 2019	Geo. Mean	425	No./100 ml	200	No./100 ml
Fecal Coliform	Aug. 2019	IMAX	1200	No./100 ml	1000	No./100 ml
Fecal Coliform	Aug. 2019	Geo. Mean	310	No./100 ml	200	No./100 ml
Fecal Coliform	Jul. 2020	IMAX	20000	No./100 ml	1000	No./100 ml
Fecal Coliform	Jul. 2020	Geo. Mean	3942	No./100 ml	200	No./100 ml
Fecal Coliform	Jun. 2021	IMAX	10800	No./100 ml	1000	No./100 ml
Fecal Coliform	Jun. 2021	Geo. Mean	283	No./100 ml	200	No./100 ml
Fecal Coliform	Nov. 2021	IMAX	20000	No./100 ml	10000	No./100 ml
Fecal Coliform	Feb. 2022	IMAX	20000	No./100 ml	10000	No./100 ml
Fecal Coliform	Jul. 2022	IMAX	4300	No./100 ml	1000	No./100 ml
Fecal Coliform	Dec. 2022	IMAX	20000	No./100 ml	1000	No./100 ml
Ammonia	Oct. 2022	Avg Mo	30.2	mg/L	4.9	mg/L
Ammonia	Nov. 2022	Avg Mo	27.9	mg/L	14.7	mg/L
Ammonia	Dec. 2022	Avg Mo	32.8	mg/L	14.7	mg/L
Ammonia	Jan. 2023	Avg Mo	24.7	mg/L	14.7	mg/L
Ammonia	Feb. 2023	Avg Mo	29.5	mg/L	14.7	mg/L
TSS	Jul. 2020	Avg Mo	48	mg/L	30	mg/L
TSS	Aug. 2020	Avg Mo	31.2	mg/L	30	mg/L
TSS	Sep. 2021	Avg Mo	31.5	mg/L	30	mg/L

Parameter	JAN-22	FEB-22	MAR-22	APR-22	MAY-22	JUN-22	JUL-22	AUG-22	SEP-22	OCT-22	NOV-22	DEC-22
Flow (MGD) Average Monthly	0.0033	0.0035	0.0032	0.0038	0.0032	0.0030	0.0030	0.0033	0.0031	0.0029	0.0035	0.0032
Flow (MGD) Daily Maximum	0.0105	0.0108	0.0095	0.0259	0.0103	0.0108	0.0131	0.0103	0.0099	0.0098	0.0124	0.0134
pH (S.U.) Instantaneous Minimum	6.75	6.78	6.40	6.00	6.08	6.30	6.23	6.43	6.50	6.51	6.70	6.60
pH (S.U.) Instantaneous Maximum	6.95	6.88	6.70	6.80	6.70	6.89	6.60	6.65	6.68	6.71	6.85	6.80
DO (mg/L) Instantaneous Minimum	8.6	8.4	8.4	8.6	7.2	6.3	7.1	6.4	6.2	6.2	6.5	6.6
TRC (mg/L) Average Monthly	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
TRC (mg/L) Instantaneous Maximum	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.02
CBOD5 (mg/L) Average Monthly	5.7	16.4	5.2	3.8	8.9	5.9	22.2	8.0	7.9	9.1	19.5	8.1
TSS (lbs/day) Average Monthly	0.39	1.77	0.90	0.79	0.88	0.68	0.77	0.48	1.15	1.32	0.82	1.49
TSS (mg/L) Average Monthly	12.5	23.0	12.3	16.0	20.8	9.5	15.5	10.8	19.8	24.8	12.9	16.5
Total Suspended Solids (lbs) Total Monthly	5.0	23.0	11.7	10.3	11.4	8.9	10.0	6.2	14.9	17.2	10.7	19.3
Total Suspended Solids (lbs) Total Annual										147.8		
Total Dissolved Solids (mg/L) Average Monthly	265	326	293	364	491	433	340	373	315	657	432	355
Fecal Coliform (No./100 ml) Geometric Mean	1	141	3	1	1	1	66	1	15	2	1	141
Fecal Coliform (No./100 ml) Instantaneous Maximum	1	20000	8	2	2	1	4300	1	53	5	1	20000
Total Nitrogen (mg/L) Average Monthly	17.30	27.00	18.50	12.27	6.89	5.25	5.59	4.68	10.99	1.18	40.50	25.56
Ammonia (mg/L) Average Monthly	2.00	2.50	2.50	3.30	3.70	2.60	1.80	3.40	3.50	30.20	27.90	32.80
Total Phosphorus (lbs/day) Average Monthly	0.03	0.10	0.08	0.01	0.02	0.02	0.03	0.01	0.05	0.03	0.03	0.06
Total Phosphorus (mg/L) Average Monthly	0.90	1.30	1.10	0.30	0.50	0.40	0.60	0.30	0.90	0.50	0.50	0.60
Total Phosphorus (lbs) Total Monthly	0.41	1.24	1.05	0.19	0.27	0.31	0.41	0.17	0.68	0.36	0.41	0.70
Total Phosphorus (lbs) Total Annual										6.53		

Values in red are non—compliances.

Parameter	JAN-23	FEB-23	MAR-23	APR-23	MAY-23	JUN-23	JUL-23	AUG-23	SEP-23	OCT-23	NOV-23	DEC-23
Flow (MGD) Average Monthly	0.0029	0.0029	0.0034	0.0033	0.0035	0.0033	0.0033	0.0037	0.0032	0.0034	0.0034	0.0034
Flow (MGD) Daily Maximum	0.0117	0.0089	0.0114	0.0117	0.0108	0.0098	0.0111	0.0113	0.0121	0.0124	0.0119	0.0119
pH (S.U.) Instantaneous Minimum	6.60	6.20	6.20	6.60	6.50	6.61	6.01	6.50	6.43	6.59	6.75	6.75
pH (S.U.) Instantaneous Maximum	6.86	6.80	6.70	6.80	6.86	7.03	7.08	7.06	6.95	7.00	6.90	6.90
DO (mg/L) Instantaneous Minimum	7.5	7.8	7.6	6.0	5.7	5.9	6.2	6.3	6.4	6.6	6.9	6.8
TRC (mg/L) Average Monthly	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
TRC (mg/L) Instantaneous Maximum	0.01	0.01	0.01	0.02	0.01	0.02	0.02	0.01	0.01	0.01	0.02	0.02
CBOD5 (mg/L) Average Monthly	6.1	4.8	6.1	13.1	4.9	6.2	4.1	6.0	8.3	2.1	9.1	7.3
TSS (lbs/day) Average Monthly	0.66	0.82	0.19	0.86	0.44	0.86	1.06	1.62	0.92	0.84	0.80	< 0.46
TSS (mg/L) Average Monthly	25.4	17.2	10.6	15.4	9.3	13.4	19.0	28.0	13.8	10.4	10.4	< 7.8
Total Suspended Solids (lbs) Total Monthly	8.5	10.7	2.6	10.3	6.2	11.2	14.8	21.1	12.0	10.0	10.4	6.0
Total Suspended Solids (lbs) Total Annual										79.5		
Total Dissolved Solids (mg/L) Average Monthly	405	440	540	561	430	466	387	498	443	396	6.9	355
Fecal Coliform (No./100 ml) Geometric Mean	< 1	< 1	< 5	< 1	16	38	23	15	11	2	< 1	4
Fecal Coliform (No./100 ml) Instantaneous Maximum	< 1	< 1	24	< 1	17	44	40	56	128	4	2	5
Total Nitrogen (mg/L) Average Monthly	49.10	44.20	18.00	14.30	6.57	19.70	17.90	13.8	6.41	20.2	22.5	22.8
Ammonia (mg/L) Average Monthly	24.7	29.5	8.20	3.10	3.90	4.60	3.0	3.8	2.8	1.5	3.3	3.2
Total Phosphorus (lbs/day) Average Monthly	0.02	< 0.01	0.01	0.02	0.01	0.02	0.03	0.04	0.04	0.03	0.07	0.07
Total Phosphorus (mg/L) Average Monthly	0.50	< 0.2	0.40	0.40	0.30	0.40	0.5	0.8	0.6	0.4	1.0	1.1
Total Phosphorus (lbs) Total Monthly	0.21	0.13	0.08	0.25	0.21	0.32	0.38	0.57	0.54	0.39	0.96	0.89
Total Phosphorus (lbs) Total Annual										2.3		

Values in red are non—compliances

4. Receiving Waters and Water Supply Information Detail Summary

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	001	Design Flow (MGD)	0.0785
Latitude	40º 32' 32"	Longitude	-75º 53' 7"
Quad Name		Quad Code	
Wastewater Description:	Sewage Effluent		
Receiving Waters	UNT to Maiden Creek	Stream Code	02067
NHD Com ID	25975630 / Reach 02040203001092	RMI	0.33
Drainage Area	2.48 sq. miles	Yield (cfs/mi^2)	0.104 (see section 4.4)
Q_{7-10} Flow (cfs)	0.26 (see section 4.4)	Q_{7-10} Basis	USGS/PA StreamStats
Elevation (ft)	345	Slope (ft/ft)	
Watershed No.	3-B	Chapter 93 Class.	TSF, MF
Existing Use	-	Existing Use Qualifier	-
Exceptions to Use	-	Exceptions to Criteria	-
Assessment Status	Impaired for Aquatic Use (assess.ID#16197,2010)& Recreational Use (assess.16480, 2010)		
Cause(s) of Impairment	Nutrients, Siltation, Siltation, pathogens		
Source(s) of Impairment	Grazing Related Agric, Grazing Related Agric, Upstream Impoundment, unknown		
TMDL Status	Final	Name	Lake Ontelaunee TMDL
	[303(d) List/Category 5 PADEP Integrated Water Quality Report]		
Secondary Receiving Water: UNT 02067 empties into Maiden Creek at approx. 12.4 RMI; TSF designation with no other existing use; not a Class A/Wilderness Trout stream; impaired for Recreational Use due to pathogens (assessment ID 15369, 2010), also subject to Lake Ontelaunee TMDL:			
Nearest Downstream Public Water Supply Intake	Reading Area Water Authority		
PWS Waters	Maiden Creek / Lake Ontelaunee	Flow at Intake (cfs)	
PWS RMI		Distance from Outfall (mi)	Approx. 11 miles

4.1 Receiving Waters

The receiving waters has been determined to be an unnamed tributary to Maiden Creek. The sequence of receiving streams are Maiden Creek, Schuylkill River, Delaware River, and Delaware Bay, which eventually drains into the Atlantic Ocean.

4.2 Public Water Supply (PWS) Intake

The nearest downstream public water supply intake is the Reading Area Water Authority intake located on Maiden Creek approximately 11 miles from the discharge. Considering the distance and nature, the discharge is not expected to significantly affect the water supply.

4.3 Class A Wild Trout Streams

The receiving stream not shown on eMapPA as a 'Class A' or 'Wilderness Trout' or 'Natural Trout Reproduction' stream. Therefore, eMapPA suggests that no Class A Wild Trout Fishery will be impacted by this discharge.

4.4 Low Flow Stream Conditions:

Water quality modeling estimates are based upon conservative data inputs. The data are typically estimated using either a stream gauge or through USGS web based StreamStats program. The NPDES effluent limits are based upon the combined flows from both the stream and the facility discharge.

A conservative approach to estimate the impact of the facility discharge using values which minimize the total combined volume of the stream and the facility discharge. The volumetric flow rate for the stream is based upon the seven-day, 10-year low flow (Q710) which is the lowest estimated flow rate of the stream during a 7 consecutive day period that occurs once in 10-year time period. The facility discharge is based upon a known design capacity of the subject facility.

Streamflow: Previously USGS gage no. 01470756 on Maiden Creek at Virginville, PA was used to estimate the Q7-10 flow. While the distance from this gage station to the point of discharge is far enough that correlation with this gage station may not be precise, it is still acceptable to use. This is due to the fact that USGS StreamStats version 1.2.22 (see Attachment C) provided the drainage area of 2.48 sq. mi. This is below the minimum drainage area value allowed to be used in USGS's regression equations to produce the accurate Q7-10. Based on low-flow statistical computations, USGS StreamStats also confirmed that "*one or more of the parameters is outside the suggested range and estimates were extrapolated with unknown errors*". Consequently, the Q7-10 flow has been estimated using a low-flow yield method with USGS gage no. 01470756, using publication *USGS Selected Streamflow Statistics for Streamgage Locations in and near Pennsylvania Open-File Report 2011–1070.*

Low Flow Yield = $Q7\text{-}10_{gage}$ / $Drainage\ Area_{gage}$ = 16.7 cfs / 159 sq.mi. = 0.105 cfs/sq.mi.

$Q7\text{-}10_{site}$ = Low Flow Yield * $Drainage\ Area_{site}$ = 0.105 cfs/sq.mi. * 2.48 sq.mi. = 0.26 cfs

Q1-10/Q7-10 = 14.8 cfs / 16.7 cfs = 0.89; Q30-10/Q7-10 = 23.4 cfs / 16.7 cfs = 1.40

The 2009 Protection Report used a Q7-10 of 0.26 cfs based on correlation with downstream gage #1470756 (RMI 9.9). Additionally, the 2018 Fact Sheet and NPDES Permit Renewal used a Q7-10 of 0.26 cfs. This current analysis corroborates the previous usage of a Q7-10 of 0.26 cfs.

5. Development of Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements 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.

5.1 Technology Based Limits

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 (TSS)	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 (TRC)	0.5	Average Monthly	-	92a.48(b)(2)

Total Phosphorus (TP)	2.0	Average Monthly		96.5
Ammonia	20	Average Monthly		18 CFR Part 410 **
Total Dissolved Solids (TDS)	1000 mg/l or a concentration established by the DRBC	Average Monthly		18 CFR Part 410 **

*Weekly average limits do not have to be imposed in situations where the minimum monitoring frequency is less than weekly, consistent with DEP's Standard Operating Procedure (SOP) for Establishing Effluent Limits in Individual Sewage Permits.

5.2 DRBC Regulations

There exists an EPA-approved **TMDL** for this waterway: the Lake Ontelaunee TMDL which assigns Waste Load Allocations (WLAs) for TSS and TP for existing point sources including this facility. TSS and TP were identified pollutants of concern causing the impairment. Excerpts of the TMDL are attached.

Christman Lake STP was allocated 3.25 metric tons/year **TSS** load based on achieving TSS concentrations of 30 mg/l and a design flow of 0.0785 MGD:
30 mg/l x 0.0785 MGD x 8.34 c.f. = 19.6 lbs/day x 365 days/yr =7168 lbs/yr= 3.25 metric tons.

It was allocated 0.109 metric tons/year TP based on achieving **TP** concentrations of 1.0 mg/l and a design flow of 0.0785 MGD: 1.0 mg/l x 0.0785 MGD x 8.34 c.f. = 0.655 lbs/day x 365 days/yr = 239 lbs/year = 0.109 metric tons

The same annual load limits will be carried forward from the previous permit: 239 lbs per year of TP and 7168 lbs/year of TSS. Christman Lake's TP and TSS loads according to the 2019-2024 DMRs and Supplemental DMRs have been well below those annual load limits.

However, in addition to the TMDL, there is a regulatory requirement for **TP**: When a receiving stream's uses are impaired due to Phosphorus, a limit of 2.0 mg/l as an average monthly concentration will be imposed. The limit of 2.0 mg/l is an achievable technology-based limit. This TP concentration limit has been added to the draft renewal permit, especially since Lake Ontelaunee is used for drinking water and the excessive nutrients have allowed algae growth, interfering with its use as a water supply. The DMRs reviewed indicate that the facility may not be able to meet this new limit with its existing treatment: the monthly average TP at outfall 001 between January 1, 2015 and February 28, 2018 was 5.9 mg/l. A one-year compliance schedule has therefore been proposed and included in the draft renewal permit.
Note: achieving a monthly average TP limit of 2.0 mg/l is in addition to the separate annual load limit of 239 lbs/year. If the treatment plant were operating at full capacity, meeting the monthly average TP limit of 2.0 mg/l could still put them at risk of exceeding the annual load limit resulting in a violation.

For **TDS**, no limit was imposed because the Chapter 93.7 State Standards apply to discharges that impact a Public Water Supply intake whereas this facility is located 11 miles upstream from such an intake. The DRBC, however, also has effluent limits. DRBC's regulations, 18 CFR Part 410 Section 3.10.4D.2., state: "Total dissolved solids shall not exceed 1000 mg/l [a TBEL], or a concentration established by the Commission which is compatible with designated water uses and stream quality objectives, and recognizes the need for reserve capacity to serve future dischargers." No DRBC docket was found for this facility for the previous renewal cycle. Previously, DRBC has allowed a monitoring requirement, without a permit limit, at other sewage plants.

A **TDS** monitoring requirement was included in existing permit to gather data. DRBC will be copied on the draft permit and can comment during the comment period.

In order to implement the regulations at Chapter 95.10 relevant to imposing **TDS** limits if increased loads trigger this requirement in the future, a TDS Baseline needs to be documented. The increase of TDS loads is measured against existing mass loads, described in Chapter 95.10(a)(1) as "maximum daily discharge loads of TDS…that were authorized by the Department prior to August 21, 2010". The previous NPDES permit did not require TDS limits, but did require monthly monitoring of TDS. A summary of the results of TDS monitoring are presented in the following table.

Year	Average Monthly TDS, mg/l
2018 (5 months of data)	342
2019	355
2020	301
2021	314
2022	387
2023 (11 months data)	447
Average of all Data (64 months)	**358**

The above data compares favorably with the DRBC's regulations, 18 CFR Part 410 Section 3.10.4D.2. It is recommended that the monitoring of TDS be continued.

5.3 Best Professional Judgment (BPJ) Limitations

N/A.

5.4 Water Quality-Based Effluent Limitations (WQBELs)

Because the facility is operating under capacity, because the DEP approved their treatment plant design flow and discharge location previously, and because no upgrades or changes in the waste stream are proposed, the model results from the last Protection Report have been reviewed and attached. (This approach is consistent with the DEP's Standard Operating Procedure: Establishing Effluent Limitations for Individual Sewage Permits.) These are the limits shown in the below table. Their permit limits for Dissolved Oxygen, Ammonia, and TRC will be carried forward. (Note: the discharge flow used in the models was 0.0785 MGD. The Fact Sheet for the WQM permit identified both the design Average Annual Flow and the Hydraulic Design Capacity as 0.0785 MGD.)

Parameter	Limit (mg/l)	SBC	Model**
Dissolved Oxygen	5.0	Minimum	WQM 7.0, version 1.0a, 2009
Ammonia	4.9	Monthly Average	WQM 7.0, version 1.0a, 2009
Ammonia	9.8	Maximum	WQM 7.0, version 1.0a, 2009
CBOD5 *	25	Monthly Average	WQM 7.0, version 1.0a, 2009
TRC	0.32	Monthly Average	TRC Excel Spreadsheet, 2009 [implements DEP guidance 391-2000-015]
TRC	1.05	IMAX	TRC Excel Spreadsheet, 2009 [implements DEP guidance 391-2000-015]

*Note that the model defaulted to the CBOD5 TBEL. If the WQBEL for CBOD5 had been more stringent than the TBEL, that result would have been indicated instead as the permit limit.

Because Ammonia is less toxic when temperatures are cooler, DEP often allows less stringent permit limits during the colder months of the year, such as by applying a multiplier of 3 to the summer limit: 4.9 mg/l x 3 = 14.7 mg/l. The same was done in the previous permit.

**The calculation tools referenced from 2009, and resulting limits, are confirmed by current (2024) calculations. WQM 7.0, version 1.0a, 2009 is updated and corroborated as Attachment A, which is version 1.1. TRC Excel Spreadsheet, 2009 is updated and presented as Attachment B.

5.5 Anti-Backsliding

N/A. No limits were made less stringent.

5.6 Antidegradation

The proposed limits are expected to protect the designated and existing uses of the receiving water consistent with the State's Antidegradation regulations and policy. No Exceptional Value or High Quality water will be impacted.

5.7 Additional Considerations

The STP is privately-owned and therefore does not file Chapter 94 reports which require influent flows. Raw sewage influent monitoring for CBOD5 and TSS were not imposed in the previous permit or in this renewal. It is a private STP and the permittee has been achieving their CBOD5 limits consistently (such as achieving secondary treatment including 85% reduction of CBOD5/BOD5). Monitoring the influent is helpful for process control, but not required.

Nutrient levels in rivers and streams are a concern. In order to gather information to assess the situation and to adequately protect the waterways, most NPDES permits are now including a monitoring requirement, at the least, for Total Nitrogen (TN) and Total Phosphorus. The statutory basis for this requirement is found at Chapter 92a.61. For this facility, TP limits and monitoring have already been imposed, as discussed. For TN, a monthly monitoring requirement has been added. A less frequent monitoring requirement was not proposed due to the fact that the receiving water (and downstream Lake Ontelaunee) have been designated as impaired for nutrients.

The sample type of 8-hour composite has been continued from the existing permit. The Permit Writers Manual [362-0400-001] does not stipulate 24-hour composites for a facility of this size.

The Permit Writers Manual does not require mass load limitations for Non-POTW sewage permits with design flows < 0.1 MGD. Accordingly, no mass load limits are imposed in the permit with the exception of TP and TSS where the TMDL must be satisfied.

5.8 Changes from Previous Permit Limits

None.

6. Proposed NPDES Parameter Details

The proposed effluent limitations and monitoring requirements for the draft permit are unchanged from the current permit limits. Refer to the table in section 2.1 for the current and proposed effluent limitations and monitoring requirements.

Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment **A**)
☐	Toxics Management Spreadsheet (see Attachment)
☒	TRC Model Spreadsheet (see Attachment **B**)
☐	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.
☒	DEP SOP: Establishing Effluent Limitations for Individual Sewage Permits, 8/23/2013
☒	Other: DRBC Regulations 18 CFR Part 410

Attachment A

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
03B	2067	Trib 02067 to Maiden Creek	**0.330**	340.00	2.48	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 (ºC)	Tributary pH	Stream Temp (ºC)	Stream pH
Q7-10	0.104	0.00	0.26	0.000	0.000	0.0	0.00	0.00	21.70	7.73	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 (ºC)	Disc pH
Blue Heron	PA0088021	0.0785	0.0785	0.0785	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	6.00	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
03B	2067	Trib 02067 to Maiden Creek	**0.000**	331.00	2.80	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (ºC)	Tributary pH	Stream Temp (ºC)	Stream pH
Q7-10	0.104	0.00	0.26	0.000	0.000	0.0	0.00	0.00	21.70	7.73	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 (ºC)	Disc pH
		0.0000	0.0000	0.0000	0.000	25.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	3.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

WQM 7.0 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	0.89	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	6		

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 (ºC)	Analysis pH
Q7-10 Flow												
0.330	0.26	0.00	0.26	.1214	0.00517	.434	8.74	20.11	0.10	0.201	22.75	7.35
Q1-10 Flow												
0.330	0.23	0.00	0.23	.1214	0.00517	NA	NA	NA	0.10	0.209	22.84	7.33
Q30-10 Flow												
0.330	0.36	0.00	0.36	.1214	0.00517	NA	NA	NA	0.12	0.175	22.53	7.41

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
0.330	Blue Heron	5.9	16.77	5.9	16.77	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
0.330	Blue Heron	1.26	4.91	1.26	4.91	0	0

Dissolved Oxygen Allocations

		CBOD5		NH3-N		Dissolved Oxygen		Critical	Percent
RMI	Discharge Name	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Reach	Reduction
0.33	Blue Heron	25	25	4.91	4.91	6	6	0	0

SWP Basin	Stream Code	Stream Name
03B	2067	Trib 02067 to Maiden Creek

RMI	Total Discharge Flow (mgd)	Analysis Temperature (ºC)	Analysis pH
0.330	0.079	22.751	7.351
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
8.735	0.434	20.115	0.101
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
9.32	1.246	1.62	0.865
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.529	23.258	Owens	6
Reach Travel Time (days)			
0.201			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.020	9.06	1.60	7.56
0.040	8.81	1.57	7.58
0.060	8.56	1.54	7.61
0.080	8.32	1.51	7.64
0.100	8.09	1.49	7.66
0.120	7.86	1.46	7.69
0.140	7.64	1.44	7.72
0.160	7.43	1.41	7.74
0.180	7.22	1.39	7.76
0.201	7.02	1.36	7.79

SWP Basin	Stream Code	Stream Name
03B	2067	Trib 02067 to Maiden 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)
0.330	Blue Heron	PA0088021	0.079	CBOD5	25		
				NH3-N	4.91	9.82	
				Dissolved Oxygen			6

Attachment B

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

0.26	= Q stream (cfs)	0.5	= CV Daily
0.0785	= Q discharge (MGD)	0.5	= CV Hourly
30	= no. samples	1	= AFC_Partial Mix Factor
0.3	= Chlorine Demand of Stream	1	= CFC_Partial Mix Factor
0	= Chlorine Demand of Discharge	15	= AFC_Criteria Compliance Time (min)
0.5	= BAT/BPJ Value	720	= CFC_Criteria Compliance Time (min)
0	= % Factor of Safety (FOS)		=Decay Coefficient (K)

Source	Reference	AFC Calculations	Reference	CFC Calculations
TRC	1.3.2.iii	WLA afc = 0.702	1.3.2.iii	WLA cfc = 0.677
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 0.262	5.1d	LTA_cfc = 0.393

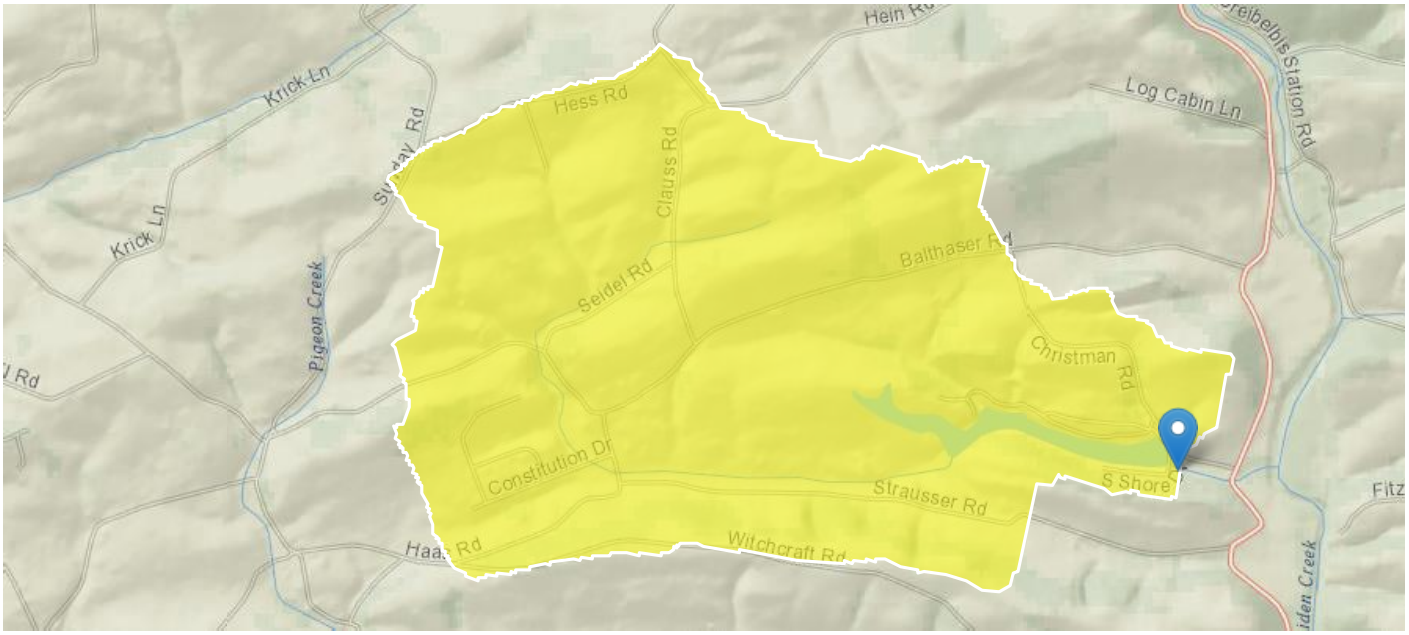
Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AML MULT = 1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.322	AFC
		INST MAX LIMIT (mg/l) = 1.053	

WLA afc	(.019/e(-k*AFC_tc)) + [(AFC_Yc*Qs*.019/Qd*e(-k*AFC_tc))... ...+ Xd + (AFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)
LTAMULT afc	EXP((0.5*LN(cvh^2+1))-2.326*LN(cvh^2+1)^0.5)
LTA_afc	wla_afc*LTAMULT_afc
WLA_cfc	(.011/e(-k*CFC_tc) + [(CFC_Yc*Qs*.011/Qd*e(-k*CFC_tc))... ...+ Xd + (CFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)
LTAMULT_cfc	EXP((0.5*LN(cvd^2/no_samples+1))-2.326*LN(cvd^2/no_samples+1)^0.5)
LTA_cfc	wla_cfc*LTAMULT_cfc
AML MULT	EXP(2.326*LN((cvd^2/no_samples+1)^0.5)-0.5*LN(cvd^2/no_samples+1))
AVG MON LIMIT	MIN(BAT_BPJ,MIN(LTA_afc,LTA_cfc)*AML_MULT)
INST MAX LIMIT	1.5*((av_mon_limit/AML_MULT)/LTAMULT_afc)

Attachment C

StreamStats Report Station Pass, LLC Blue Heron Village WWTF

Region ID: PA
Workspace ID: PA20240303161646033000
Clicked Point (Latitude, Longitude): 40.54219, -75.88534
Time: 2024-03-03 11:17:09 -0500



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
CARBON	Percentage of area of carbonate rock	0	percent
DRNAREA	Area that drains to a point on a stream	2.48	square miles
PRECIP	Mean Annual Precipitation	47	inches
ROCKDEP	Depth to rock	3	feet
STRDEN	Stream Density -- total length of streams divided by drainage area	1.67	miles per square mile

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region 2]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	2.48	square miles	4.93	1280
PRECIP	Mean Annual Precipitation	47	inches	35	50.4
STRDEN	Stream Density	1.67	miles per square mile	0.51	3.1
ROCKDEP	Depth to Rock	3	feet	3.32	5.65

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
CARBON	Percent Carbonate	0	percent	0	99

Low-Flow Statistics Disclaimers [Low Flow Region 2]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Low-Flow Statistics Flow Report [Low Flow Region 2]

Statistic	Value	Unit
7 Day 2 Year Low Flow	0.184	ft^3/s
30 Day 2 Year Low Flow	0.296	ft^3/s
7 Day 10 Year Low Flow	0.0472	ft^3/s
30 Day 10 Year Low Flow	0.0826	ft^3/s
90 Day 10 Year Low Flow	0.17	ft^3/s

Low-Flow Statistics Citations

Stuckey, M.H.,2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p. (http://pubs.usgs.gov/sir/2006/5130/)

Application Version: 4.19.4
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1