pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0087611**
Facility Type	**Municipal**	APS ID	**3926**
Major / Minor	**Minor**	Authorization ID	**1291956**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Richfield Area Joint Authority**	Facility Name	**Richfield STP**
Applicant Address	186 Seven Stars Road	Facility Address	186 Seven Stars Road
	Richfield, PA 17086-8824		Richfield, PA 17086-8824
Applicant Contact	Steve Sauers	Facility Contact	Todd Mace
Applicant Phone	(717) 694-0016	Facility Phone	(570) 898-1602
Client ID	68007	Site ID	462883
Ch 94 Load Status	Not Overloaded	Municipality	Monroe Township
Connection Status	No Limitations	County	Juniata
Date Application Received	October 11, 2019	EPA Waived?	Yes
Date Application Accepted	October 21, 2019	If No, Reason	

Purpose of Application: NPDES Renewal.

Summary of Review

The Richfield Area Joint Authority has applied to the Pennsylvania Department of Environmental Protection (DEP) for reissuance of its NPDES permit for the Richfield STP. The permit was last reissued to the Richfield Area Joint Authority on March 26, 2015 and became effective on May 1, 2015. The permit expired on April 30, 2020 but the terms and conditions of the permit have been administratively extended since that time.

Based on the review outlined in this fact sheet, it is recommended that the permit be drafted, and a notice of the draft permit be published in the *Pennsylvania Bulletin* for public comments for 30 days. A file review of documents associated with the discharge or permittee may be available at the PA DEP southcentral regional office (SCRO), 909 Elmerton Avenue, Harrisburg, PA 17110. To make an appointment for file reviews, contact the SCRO file review coordinator at 717.705.4700.

Public Participation

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

Approve	Deny	Signatures	Date
x		Aaron Baar / Permits Section Aaron Baar	January 15, 2021
		Daniel W. Martin, P.E. / Environmental Engineer Manager	

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	.085
Latitude	40º 41' 22.12"	Longitude	-77º 6' 11.11"
Quad Name	Richfield	Quad Code	1329
Wastewater Description:	Sewage Effluent		
Receiving Waters	West Branch Mahantango Creek (TSF)	Stream Code	17427
NHD Com ID	54971257	RMI	16.1
Drainage Area	10.8	Yield (cfs/mi^2)	0.14167
Q_{7-10} Flow (cfs)	1.53	Q_{7-10} Basis	USGS StreamStats
Elevation (ft)	631.18	Slope (ft/ft)	
Watershed No.	6-C	Chapter 93 Class.	TSF
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	
Nearest Downstream Public Water Supply Intake	United Water Company		
PWS Waters	Susquehanna River	Flow at Intake (cfs)	
PWS RMI		Distance from Outfall (mi)	~43

Drainage Area

The discharge is to West Branch Mahantango Creek at RMI 16.1. A drainage area upstream of the discharge point is determined to be 10.8 sq.mi. according to USGS PA StreamStats available at https://streamstats.usgs.gov/ss/.

Stream Flow

According to StreamStats, the West Branch Mahantango Creek watershed has a Q_{7-10} of 1.53 cfs and a drainage area of 10.8 mi^2, which results in a LFY of 0.14167 cfs/mi^2.

West Branch Mahantango Creek

West Branch Mahantango Creek is classified as aTSF waterway. Effluent limits for this discharge have been developed to ensure that existing in-stream water uses and the level of water quality necessary to protect the existing uses are maintained and protected.

Public Water Supply Intake

The nearest downstream public water supply intake is the United Water Company intake located on the Susquehanna River. Considering the distance and nature of the discharge, the discharge is not expected to significantly affect the water supply.

Class A Wild Trout Streams

The receiving stream is not a Class A Wild Trout stream.

Treatment Facility Summary				
Treatment Facility Name: Richfield Area Joint Authority - STP				
WQM Permit No.	**Issuance Date**			
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Secondary	Sequencing Batch Reactor	Ultraviolet	0.085
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.085	170	Not Overloaded		

The Richfield Area Joint Authority owns and operates the Richfield sanitary wastewater treatment facility located in Monroe Township, Juniata County. The facility serves Monroe Township and portions of West Perry Township (Snyder County), all wastes are residential in nature, and all sewer systems are 100% separated. Having an annual average design flow of 0.085 MGD and a hydraulic design capacity of 0.085 MGD, this facility consists of two SBR tanks, a UV disinfection unit, one aerobic digestor and the outfall (Outfall 001). No chemical amendments are identified as being used to supplement the treatment process. Sludge is disposed of at the Kelly Township Municipal Authority STP.

Compliance History	
Summary of DMRs:	A summary of past DMR data is presented on the next page.
Summary of Inspections:	Since the last NPDES permit renewal, there are records in the Department's File Room that the facility has been inspected three times. The notes from the inspections are as follows: 11/15/2016: Pat Bowen, DEP Water Quality Specialist, conducted a routine inspection. No violations were noted. 03/28/2017: Pat Bowen, DEP Water Quality Specialist, conducted a routine inspection. Operational issues were identified, but no violations were noted. 07/20/2018: Pat Bowen, DEP Water Quality Specialist, conducted a routine inspection. No violations were noted.

Other Comments: A records review revealed that there are no Clean Water open violations associated with this permitee as of January 15, 2021.

Compliance History

DMR Data for Outfall 001 (from December 1, 2019 to November 30, 2020)

Parameter	NOV-20	OCT-20	SEP-20	AUG-20	JUL-20	JUN-20	MAY-20	APR-20	MAR-20	FEB-20	JAN-20	DEC-19
Flow (MGD) Average Monthly	0.052	0.061	0.055	0.054	0.044	0.032	0.041	0.047	0.048	0.045	0.042	0.046
Flow (MGD) Daily Maximum	0.09	0.115	0.077	0.118	0.068	0.048	0.193	0.26	0.153	0.137	0.078	0.162
pH (S.U.) Minimum	6.75	6.84	6.48	6.4	6.89	6.82	6.72	6.78	6.88	6.82	6.55	6.81
pH (S.U.) Maximum	7.15	7.14	7.12	7.16	7.25	7.17	7.13	7.08	7.34	7.19	7.11	7.43
DO (mg/L) Minimum	5.2	5.1	5.3	5.12	5.19	5.34	5.04	5.16	5.08	5.22	5.03	5.24
CBOD5 (lbs/day) Average Monthly	3	3	< 2	< 2	< 1	< 1	< 1	< 1	< 2	< 1	< 1	< 1
CBOD5 (lbs/day) Weekly Average	5	4	2	3	2	2	3	2	3	3	< 1	2
CBOD5 (mg/L) Average Monthly	6	6	< 3	< 4	< 4	< 4	< 4	< 3	< 4	< 4	< 3	< 3
CBOD5 (mg/L) Weekly Average	8	7	5	6	6	8	5	4	6	6	4	4
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	84	128	107	74	69	63	45	57	82	74	63	58
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	117	143	133	138	89	77	66	66	102	96	143	84
BOD5 (mg/L) Raw Sewage Influent Average Monthly	182	239	230	157	215	231	157	145	254	243	172	173
TSS (lbs/day) Average Monthly	2	4	< 2	< 0.9	< 0.8	< 0.5	< 0.9	< 1	< 0.8	0.9	< 0.8	< 1
TSS (lbs/day) Raw Sewage Influent Average Monthly	65	70	78	69	43	70	50	61	48	51	35	83

TSS (lbs/day) Raw Sewage Influent Daily Maximum	85	107	129	112	58	105	82	93	86	63	57	145
TSS (lbs/day) Weekly Average	4	6	3	2	2	0.8	2	3	2	1	1	2
TSS (mg/L) Average Monthly	5	8	< 3	< 2	< 2	< 2	< 3	< 3	< 2	3	< 2	< 3
TSS (mg/L) Raw Sewage Influent Average Monthly	154	133	168	147	137	237	171	147	148	177	100	218
TSS (mg/L) Weekly Average	7	12	5	3	5	2	6	5	4	5	4	4
Fecal Coliform (CFU/100 ml) Geometric Mean	< 1	< 1	< 1	< 4	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	< 4	< 4	< 1	54.8	2	2	< 1	< 1	< 1	< 1	< 1	< 1
Nitrate-Nitrite (mg/L) Average Monthly	< 2.35	< 8.236	FF	7.969	< 1.698	< 2.868	< 12.941	< 7.537	< 1.8	< 2.19	4.73	8.606
Total Nitrogen (mg/L) Average Monthly	< 4.962	< 9.878	FF	< 8.629	< 2.198	< 3.368	17.48	< 8.037	< 4.193	< 2.742	< 5.23	< 9.356
Ammonia (lbs/day) Average Monthly	< 0.3	< 0.3	< 0.05	< 0.05	< 2.0	< 0.2	< 0.04	< 0.04	< 0.04	< 0.03	< 0.07	< 0.04
Ammonia (mg/L) Average Monthly	< 0.541	< 0.61	< 0.1	< 0.1	< 7.03	< 0.642	< 0.1	< 0.1	< 0.133	< 0.1	< 0.2	< 0.1
TKN (mg/L) Average Monthly	2.613	1.643	FF	< 0.66	< 0.5	< 0.5	< 0.5	< 0.5	2.393	< 0.553	< 0.5	< 0.8
Total Phosphorus (mg/L) Average Monthly	4.73	7.47	FF	4.24	3.083	3.36	2.28	3.38	2.62	3.19	3.02	5.7

Existing Permit Limits

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	9.0 Max	XXX	1/day	Grab
DO	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
CBOD5	18	23	XXX	25	40	50	1/week	8-Hr Composite
BOD5 Raw Sewage Influent	XXX	XXX	XXX	Report	XXX	XXX	1/week	8-Hr Composite
BOD5 (lbs) Raw Sewage Influent	Report	Report Daily Max	XXX	XXX	XXX	XXX	1/week	Calculation
TSS Raw Sewage Influent	XXX	XXX	XXX	Report	XXX	XXX	1/week	8-Hr Composite
TSS	21	32	XXX	30	45	60	1/week	8-Hr Composite
Total Suspended Solids (lbs) Raw Sewage Influent	Report	Report Daily Max	XXX	XXX	XXX	XXX	1/week	Calculation
Fecal Coliform (CFU/100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	1/week	Grab
Fecal Coliform (CFU/100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/week	Grab
Nitrate-Nitrite	XXX	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Total Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	2/month	Calculation
Ammonia Nov 1 - Apr 30	Report	XXX	XXX	Report	XXX	Report	1/week	8-Hr Composite
Ammonia May 1 - Oct 31	5.3	XXX	XXX	7.5	Report Daily Max	15	1/week	8-Hr Composite
TKN	XXX	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Total Phosphorus	XXX	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite

Compliance Sampling Location: Outfall 001

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** .085
Latitude 40º 41' 22.49" **Longitude** -77º 6' 11.02"
Wastewater Description: Sewage Effluent

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: These standards apply, subject to water quality analysis and BPJ where applicable.

Water Quality-Based Limitations

CBOD5, NH3-N and Dissolved Oxygen (DO)

WQM 7.0 version 1.0b is a water quality model designed to assist DEP to determine appropriate permit requirements for CBOD5, NH3-N and DO. DEP's guidance 391-2000-007 provides the technical methods contained in WQM 7.0 for conducting wasteload allocation and for determining recommended NPDES effluent limits for point source discharges.

The model was utilized, and the model output indicated that existing limits for ammonia are lower than those specified in the model. Due to anti-backsliding provisions, however, the existing limits are deemed to be still appropriate. The existing D.O. limit of 5 mg/L is also considered still appropriate.

The monitoring frequency and sample type for CBOD5, DO and ammonia are proposed to remain unchanged.

Toxics

There are no industrial contributions to this facility. DEP's NPDES permit application for minor sewages (less than 1.0 MGD) does not require sampling for heavy metals including Total Copper, Total Lead, and Total Zinc.

Best Professional Judgment (BPJ) Limitations

Total Phosphorus & Total Nitrogen

DEP's SOP no. BPNPSM-PMT-033 recommends monitoring requirements for Total Phosphorus and Total Nitrogen for all sewage facilities. The monitoring of NOx and TKN have been added to this permit to facilitate the collection of TN data. Also, the reporting frequency of TN is proposed to be increased in this permit to once every six months (from 1/year) in conformity with other Chesapeake Bay Phase 5 permits issued in the region.

Ultraviolet Disinfection

Based on inspection reports, it appears that the existing UV system is equipped with an intensity sensor; therefore, UV intensity is proposed to be added to the permit as the monitoring parameter for UV system.

Additional Considerations

Flow Monitoring

The requirement to monitor the volume of effluent will remain in the draft permit per 40 CFR § 122.44(i)(1)(ii).

Chesapeake Bay TMDL

The Department formulated a strategy in April 2007, to comply with the EPA's and Chesapeake Bay Foundation's 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 received 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) facilities were 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).

EPA published the Chesapeake Bay Total Maximum Daily Load (TMDL) in December of 2010. Despite extensive restoration efforts during the past 25 years, the TMDL was prompted by insufficient progress and continued poor water quality in the Chesapeake Bay and its tidal tributaries.

In order to address the TMDL, Pennsylvania developed, in addition to the Bay Strategy, a Chesapeake Watershed Implementation Plan (WIP) Phase 1 in January 2011 and Phase 2 in March 2012. In accordance with the Phase 3 WIP and its supplement, re-issuing permits for significant dischargers follow the same phased approach formulated in the original Bay strategy, whilst Phase 4 and Phase 5 will be required to monitor and report TN and TP during permit renewal.

The Phase 3 WIP categorizes this facility as a phase 5 non-significant sewage facility that has a design flow less than 0.2 MGD but greater than 0.002 MGD. The WIP recommends monitoring and reporting for Total Nitrogen and Total Phosphorus throughout the permit term at a frequency no less than annual. The monitoring of NOx, TKN and TN twice monthly will be continued from the previous renewal.

Monitoring Frequency and Sample Type

The facility currently is required to collect 2/month grab effluent samples for CBOD5, TSS, fecal, and TP. This monitoring frequency is consistent with Table 6-3 of DEP's technical guidance no. 362-0400-001 and will remain unchanged in this permit.

Antidegradation Requirements

All effluent limitations and monitoring requirements 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.

Anti-backsliding Requirement

All effluent limits proposed in this fact sheet are as stringent as effluent limits specified in the existing permit renewal. This approach is in accordance with 40 CFR §122.44(l(1).

Mass Loading Limitations

All effluent mass loading limits are based on the formula: design flow x concentration limit x conversion factor of 8.34.

Proposed Effluent Limitations and Monitoring Requirements

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

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

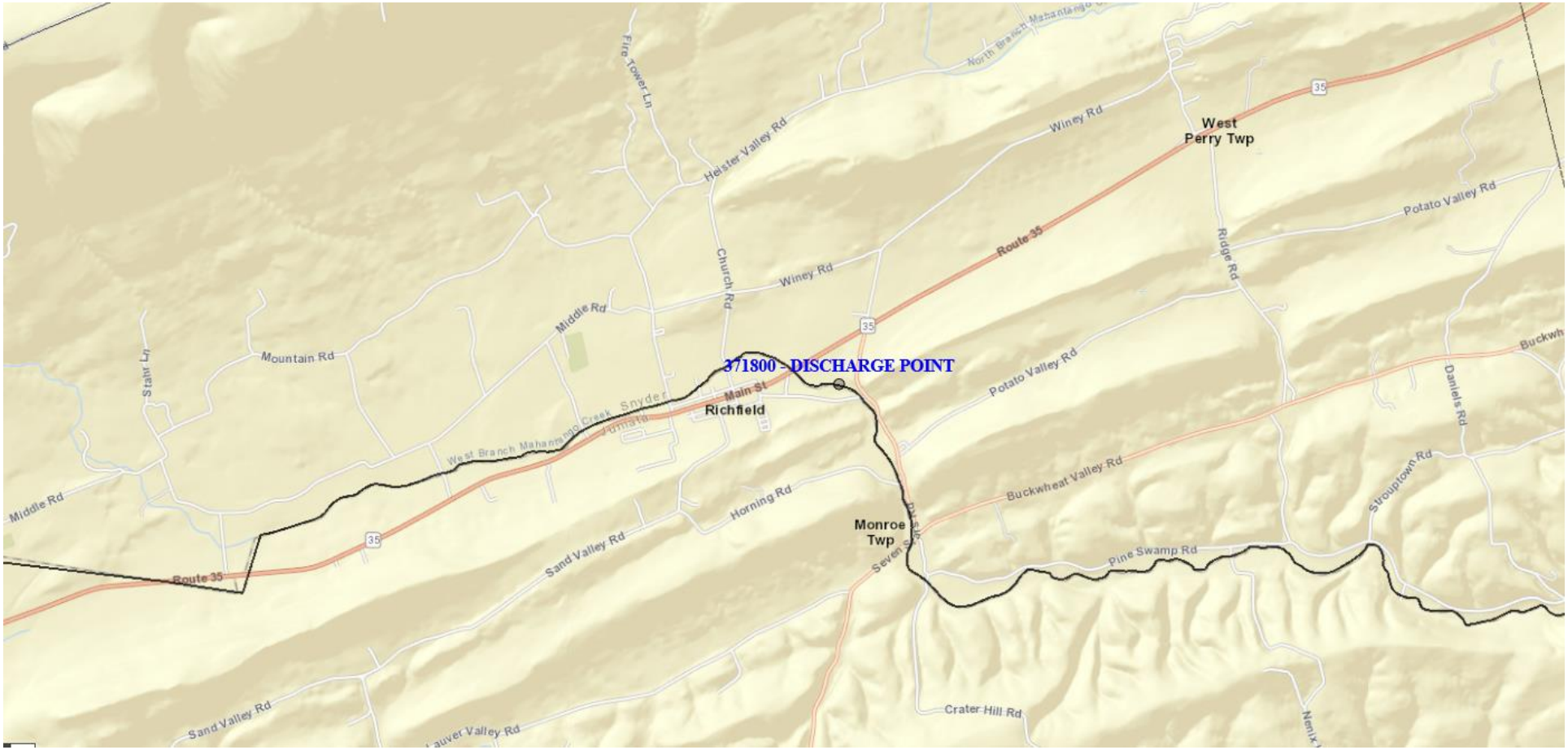
Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	9.0 Max	XXX	1/day	Grab
DO	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
CBOD5	18	23	XXX	25	40	50	1/week	8-Hr Composite
BOD5 Raw Sewage Influent	XXX	XXX	XXX	Report	XXX	XXX	1/week	8-Hr Composite
BOD5 (lbs) Raw Sewage Influent	Report	Report Daily Max	XXX	XXX	XXX	XXX	1/week	Calculation
TSS Raw Sewage Influent	XXX	XXX	XXX	Report	XXX	XXX	1/week	8-Hr Composite
TSS	21	32	XXX	30	45	60	1/week	8-Hr Composite
Total Suspended Solids (lbs) Raw Sewage Influent	Report	Report Daily Max	XXX	XXX	XXX	XXX	1/week	Calculation
Fecal Coliform (CFU/100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	1/week	Grab
Fecal Coliform (CFU/100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/week	Grab
UV Intensity (mW/cm²)	XXX	XXX	Report	XXX	XXX	XXX	1/day	Measured
Nitrate-Nitrite	XXX	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Total Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	2/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	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Ammonia Nov 1 - Apr 30	XXX	XXX	XXX	Report	Report Daily Max	XXX	1/week	8-Hr Composite
Ammonia May 1 - Oct 31	XXX	XXX	XXX	7.5	Report Daily Max	15	1/week	8-Hr Composite
Ammonia (lbs) Nov 1 - Apr 30	Report	Report Daily Max	XXX	XXX	XXX	XXX	1/week	Calculation
Ammonia (lbs) May 1 - Oct 31	5.3	Report Daily Max	XXX	XXX	XXX	XXX	1/week	Calculation
TKN	XXX	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Total Phosphorus	XXX	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite

Compliance Sampling Location: Outfall 001

Permit No. PA0087611



Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment)
☐	PENTOXSD for Windows Model (see Attachment)
☒	TRC Model Spreadsheet (see Attachment)
☐	Temperature Model Spreadsheet (see Attachment)
☐	Toxics Screening Analysis 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:
☐	Other:

PA0087611

Region ID:	PA
Workspace ID:	PA20210114125722620000
Clicked Point (Latitude, Longitude):	40.68937, -77.10272
Time:	2021-01-14 07:57:40 -0500

Outfall 001

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	10.8	square miles
PRECIP	Mean Annual Precipitation	45	inches
STRDEN	Stream Density -- total length of streams divided by drainage area	1.96	miles per square mile
ROCKDEP	Depth to rock	5	feet
CARBON	Percentage of area of carbonate rock	33.17	percent

Low-Flow Statistics Parameters[Low Flow Region 2]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	10.8	square miles	4.93	1280
PRECIP	Mean Annual Precipitation	45	inches	35	50.4
STRDEN	Stream Density	1.96	miles per square mile	0.51	3.1
ROCKDEP	Depth to Rock	5	feet	3.32	5.65
CARBON	Percent Carbonate	33.17	percent	0	99

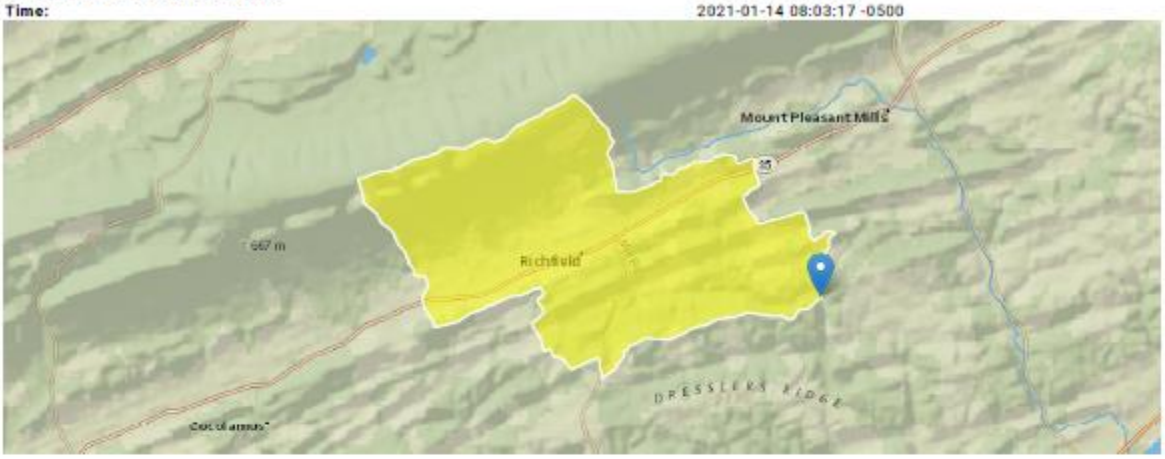
Low-Flow Statistics Flow Report[Low Flow Region 2]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	SEp
7 Day 2 Year Low Flow	2.65	ft^3/s	38	38
30 Day 2 Year Low Flow	3.19	ft^3/s	33	33
7 Day 10 Year Low Flow	1.53	ft^3/s	51	51
30 Day 10 Year Low Flow	1.8	ft^3/s	46	46
90 Day 10 Year Low Flow	2.23	ft^3/s	36	36

PA0087611

Region ID:	PA
Workspace ID:	PA20210114130258944000
Clicked Point (Latitude, Longitude):	40.67779, -77.03714
Time:	2021-01-14 08:03:17 -0500



Downstream reach

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	19.6	square miles
PRECIP	Mean Annual Precipitation	44	inches
STRDEN	Stream Density -- total length of streams divided by drainage area	1.88	miles per square mile
ROCKDEP	Depth to rock	4.6	feet
CARBON	Percentage of area of carbonate rock	21.26	percent

Low-Flow Statistics Parameters[Low Flow Region 3]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	19.6	square miles	4.93	1280
PRECIP	Mean Annual Precipitation	44	inches	35	50.4
STRDEN	Stream Density	1.88	miles per square mile	0.51	3.1
ROCKDEP	Depth to Rock	4.6	feet	3.32	5.65
CARBON	Percent Carbonate	21.26	percent	0	99

Low-Flow Statistics Flow Report[Low Flow Region 3]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	SEp
7 Day 2 Year Low Flow	3.65	ft^3/s	38	38
30 Day 2 Year Low Flow	4.62	ft^3/s	33	33
7 Day 10 Year Low Flow	1.91	ft^3/s	51	51
30 Day 10 Year Low Flow	2.4	ft^3/s	46	46
90 Day 10 Year Low Flow	3.28	ft^3/s	36	36

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
06C	17427	WEST BRANCH MAHANTANGO 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)
16.100	Richfield STP	PA0087611	0.085	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			5

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
06C	17427	WEST BRANCH MAHANTANGO 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
16.100	Richfield STP	9.27	50	9.27	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
16.100	Richfield STP	1.88	25	1.88	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)		
16.10	Richfield STP	25	25	25	25	5	5	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
06C	17427	WEST BRANCH MAHANTANGO CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
16.100	0.085	20.396	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
18.740	0.557	33.624	0.159
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
3.82	0.345	1.98	0.722
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.986	4.769	Tsivoglou	6
Reach Travel Time (days)			
1.844			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.184	3.58	1.73	7.65
0.369	3.36	1.52	7.62
0.553	3.15	1.33	7.70
0.738	2.95	1.16	7.82
0.922	2.76	1.02	7.95
1.106	2.59	0.89	8.06
1.291	2.43	0.78	8.17
1.475	2.28	0.68	8.18
1.660	2.13	0.60	8.18
1.844	2.00	0.52	8.18

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	☑
WLA Method	EMPR	Use Inputted W/D Ratio	☐
Q1-10/Q7-10 Ratio	0.64	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.36	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	6		

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	☑
WLA Method	EMPR	Use Inputted W/D Ratio	☐
Q1-10/Q7-10 Ratio	0.64	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.36	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	6		

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
06C	17427	WEST BRANCH MAHANTANGO 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												
16.100	1.53	0.00	1.53	.1315	0.00313	.557	18.74	33.62	0.16	1.844	20.40	7.00
Q1-10 Flow												
16.100	0.98	0.00	0.98	.1315	0.00313	NA	NA	NA	0.13	2.310	20.59	7.00
Q30-10 Flow												
16.100	2.08	0.00	2.08	.1315	0.00313	NA	NA	NA	0.19	1.571	20.30	7.00

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
06C	17427	WEST BRANCH MAHANTANGO CR	**16.100**	631.18	10.80	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 (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.142	0.00	1.53	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
Richfield STP	PA0087611	0.0850	0.0850	0.0850	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