Water Management Plan for Unconventional Shale Gas Well Development

Big Sewickley Creek – Water Management Plan Amendment Application

1000 Commerce Drive
Park Place One
Suite 400
Pittsburgh, PA 15275

(412) 275-3200

May 2, 2023

List of Attachments

Section I

Applicant and Plan Coverage Information

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS MANAGEMENT

WATER MANAGEMENT PLAN APPROVAL/RENEWAL REQUEST
(Unconventional Operations Only)

I. APPLICANT AND PLAN COVERAGE INFORMATION		
Applicant PennEnergy Resources, LLC	DEP ID / OGO No. (If applicable) 294943	Address 1000 Commerce Drive Park Place One Suite 400 Pittsburgh, PA 15275
Contact Name/Title Richard Watson, Project Manager	Telephone No. 412-935-5027	Email rmwatson@pennenergyresources.com
Area Covered: This water management plan (WMP) applies to water sources located or to be utilized in the following oil and gas districts.		
☒ Northwest District (Meadville)	☒ Southwest District (Pittsburgh)	☐ Eastern District (Williamsport)

Section II

General Water Source Information

II. GENERAL WATER SOURCE INFORMATION

A. List of Proposed Water Sources

		Location		Amount		Type of Source (*check*)				Source Control	
	Source Name	County / Municipality	Major River Basin*	Proposed 30-day Average Daily Quantity of Withdrawal (MGD)	Proposed Inst. Max Withdrawal Rate (gpm)	Surface Water	Groundwater	Wastewater, Mine Water, Cooling Water Discharge	Public Water Supply	Applicant Owns/Controls Source	Purchasing/Interconnecting
1	Big Sewickley Creek	Beaver Co. /Economy Borough	3	1.5	1,041	☒	☐	☐	☐	☒	☐
2		/				☐	☐	☐	☐	☐	☐
3		/				☐	☐	☐	☐	☐	☐
4		/				☐	☐	☐	☐	☐	☐
5		/				☐	☐	☐	☐	☐	☐
6		/				☐	☐	☐	☐	☐	☐
7		/				☐	☐	☐	☐	☐	☐
8		/				☐	☐	☐	☐	☐	☐
9		/				☐	☐	☐	☐	☐	☐
10		/				☐	☐	☐	☐	☐	☐

* Major River Basins = (1) Delaware; (2) Great Lakes (including Genesee River Basin); (3) Ohio; (4) Potomac; or (5) Susquehanna

B. Water Source and Use Monitoring and Act 220 Water Use Registration and Reporting

For sources in Susquehanna River Basin, refer to a water withdrawal and consumptive use metering and monitoring plan meeting Susquehanna River Basin Commission (SRBC) requirements. For sources in Delaware River Basin, refer to a water withdrawal and use monitoring plan meeting the Delaware River Basin Commission (DRBC) requirements. Water withdrawal and use monitoring plans approved meeting SRBC and DRBC requirements may be incorporated by reference and are accepted by the Department of Environmental Protection (DEP).

For sources in other basins, provide a water source and use monitoring plan. **See Attachment A**

Will the total water withdrawn from listed sources and other sources operated by the applicant in same watershed exceed an average rate of 10,000 gpd in any 30-day period? If yes, an Act 220 registration must be filed within 30 days of initiating water withdrawal or use.	☒ Yes ☐ No

Section III

Specific Water Source Information

III. SPECIFIC WATER SOURCE INFORMATION

A. Surface Water Sources

A.1 Source Identification and Notification

Source No. as Listed in Section II. A.	Name of Stream or Other Surface Water Body	☒ New Source ☐ Renewal of a Source ☐ Amendment to an Approved Source		
		Location of Proposed Withdrawal Point		
		County	Municipality	GPS Coordinates
1	Big Sewickley Creek	Beaver County	Economy Borough	Latitude (DD) 40.6094 Longitude (DD) - 80.1804

Attach copy of USGS 7.5-minute quadrangle map indicating location of proposed source. **See Attachment C**

A.2 River Basin Commission Approvals

If the source is located in the Delaware or Susquehanna River Basin, has a DRBC or SRBC approval been obtained?
☐ Yes ☐ No N/A
If yes, include a copy of DRBC or SRBC approval with this form.

Date application submitted N/A
Anticipated approval date N/A
SRBC or DRBC Approval No. N/A
Date issued N/A

A.3 Operations Plan

The operations plan must include an intake design, a flow schematic, site layout, and a footprint for each surface water withdrawal. **See Attachment D**

A.4 Stream Impact and Low Flow Analysis

a. Drainage area at point of withdrawal (sq.mi.) 17	Describe or attach basis of calculation **See Attachment E – USGS StreamStats**
b. Q7-10 low flow at point of withdrawal (gpd) 165,457 gpd	Describe or attach basis of calculation (e.g., StreamStats printout) **See Attachment E – USGS StreamStats**
c Average daily flow of stream at point of withdrawal (gpd) 13,960,408 gpd	Describe or attach basis of calculation (e.g., StreamStats printout) **See Attachment E - USGS StreamStats**

d. Is the proposed maximum rate of withdrawal greater than 10 percent of Q_{7-10} at point of withdrawal? ☒ Yes ☐ No

e. Proposed pass-by flow (cfs) 6.5 Oct-Mar; 10.8 Apr-Sept **(See Attachment F)**

A.5 Stream Classification and Uses

a. Designated use classification per 25 Pa. Code Chapter 93: **TSF**

b. PA DEP existing use determinations
(if different than designated uses in Chapter 93): **Not Applicable**

c. Is the proposed source special protection water (HQ or EV)? ☐ Yes ☒ No

d. Is stream classified by the PA Fish and Boat Commission as a wild trout stream? ☐ Yes ☒ No
If yes, what classification of wild trout stream? ☐ Class A ☐ Not Class A If known, ☐ Class B ☐ Class C ☐ Class D

A.6 PA Natural Diversity Inventory (PNDI)

Attach results of a PNDI search and, if applicable, supporting documentation of conflict resolution. If a sequential review was conducted, or if a concurrent review is being conducted, attach the PNDI Receipt, completed PNDI Form, and a USGS 7.5-minute quadrangle map showing project boundaries. **See Attachment G**

A.7 PA Historic and Museum Commission (PHMC)

Attach results of proof of consultation with the PHMC regarding the presence of a historical or archaeological site included on the federal or state list of historical places at the location of the withdrawal. **See Attachment H**

A.8 County and Municipality Notifications

Attach proof of notification of the proposed withdrawal to municipalities and counties where the water source will be located. **See Attachment I**

A.9 Withdrawal Impacts Analysis

Develop a narrative withdrawal and diversion impact analysis to address anticipated impacts and describe the methods proposed to avoid or mitigate impacts (such as proposed passby flow conditions). The description should indicate impacts anticipated after considering avoidance or mitigation measures.

See Attachment J for responses to the items listed below.

Impact questions

a. Attach a plan indicating how the surface water withdrawal intake will be designed and operated to minimize entrainment and impingement of fish and other aquatic life.

b. Are there any wetlands in the floodplain downstream of the proposed withdrawal where the withdrawal is anticipated to have a material impact on the elevation or duration of water levels in the wetland? ☐ Yes ☒ No
   If yes, identify the wetlands; describe their functions and values, and the proposed method for avoiding or mitigating such impact on the values or functions of the affected wetlands.

c. Is the proposed withdrawal anticipated to significantly affect the available habitat of fish species at or below the withdrawal point? ☐ Yes ☒ No (If a passby flow is proposed consistent with SRBC's Guidelines for Using and Determining Passby Flows and Conservation Releases for Surface Water and Groundwater Withdrawal Approvals dated November 8, 2002, policy No. 2003-1, the impact on fish species is assumed to be acceptable and further analysis is not required. Sources in Susquehanna River Basin need to follow SRBC Low Flow Protection Policy (LFPP) and technical guidance adopted by the commission on December 14, 2012 for proposing passby flow.)
   If yes, describe the measures proposed to avoid the impacts.

d. Is the applicant aware of any significant downstream wastewater discharges to the stream where the proposed withdrawal is anticipated to reduce the assimilative capacity of the stream to accept those discharges without exceeding applicable instream water quality standards? ☐ Yes ☒ No
   If yes, describe the measures proposed to avoid changes in water quality standards.

e. Is the withdrawal from a stream that is listed as being water quality impaired; and would the withdrawal materially exacerbate the water quality conditions leading to the impaired designation? ☐ Yes ☒ No
   If yes, describe the measures proposed to avoid the impacts.

f. Is the applicant aware of any significant thermal discharge (such as a power plant) that is downstream of the proposed withdrawal where the proposed withdrawal would diminish the capacity to assimilate that discharge without exceeding instream thermal standards? ☐ Yes ☒ No
   If yes, describe the measures proposed to avoid changes in the assimilate capacity of the stream.

g. Does the withdrawal impact a special protection (HQ or EV) body of water? ☐ Yes ☒ No
   If yes, describe how the withdrawal will be managed to protect existing water quality and uses.

h. Is the applicant aware of any downstream potable water supply source where the proposed withdrawal is anticipated to impair the amount of water available to meet the demands of such potable water supply? ☐ Yes ☒ No
   If yes, describe the measures proposed to avoid the impacts.

i. Is the applicant aware of any other downstream water supply uses (for example agricultural, industrial, etc.) where the proposed withdrawal is anticipated to impair the amount of water available to meet the demands of such water supply? ☐ Yes ☒ No

If yes, describe the measures proposed to avoid the impacts.

j. Describe any impact avoidance or mitigation plans being proposed, such as seasonal withdrawals or passby flows.
See Attachment J

A.10 Prevention of Rapid Movement of Invasive, Harmful, or Nuisance Species

Describe the measures to be taken to prevent the rapid movement of invasive, harmful or nuisance species by vehicles, equipment, or other facilities from one site to another.

A backflow prevention device will be installed to prevent comingling of water from other sources with water from this location. The intake, withdrawal line, and pump will either be purchased new and dedicated for use solely at this location or will be thoroughly cleaned and sanitized prior to use at this location.

Section IV

Reuse Plan

IV. REUSE PLAN
Submit a reuse plan for fluids that will be used to hydraulically fracture wells. If applicable, include proof of a wastewater source reduction strategy in compliance with 25 Pa. Code section 95.10(b). **See Attachment L**

Section V

Signature

V. SIGNATURE

I certify under penalty of law that I have the authority to submit this Water Management Plan on behalf of the applicant, and that the information set forth in this plan and all attachments is true and accurate to the best of my knowledge.

Richard Watson	Manager, Permitting and Compliance
Applicant Name (type or print legibly)	**Title**
	3·8·2023
Applicant Signature	**Date**

Attachment A

Water Source and Use Monitoring Plan

WATER SOURCE AND USE MONITORING PLAN

1000 Commerce Drive
Park Place One
Suite 400
Pittsburgh, PA 15275

(412) 275-3200

Revised: March 2, 2023

PennEnergy Resources, LLC
Water Source and Use Monitoring Plan

PennEnergy Resources, LLC (PennEnergy) intends to withdraw water from Big Sewickley Creek, located in Economy Borough, Beaver County, Pennsylvania for activities associated with the drilling and hydro-fracturing of natural gas wells. A withdrawal of 1.5 million gallons per day is proposed.

Normally, these withdrawals are intermittent in nature. This intake will be used for development of wells in the direct vicinity and will be used for a period of one to three months, followed by several months or years of inactivity. The entire temporary intake system will be removed from the floodway when not in use. This Water Source and Use Monitoring Plan has been prepared to identify the methods to be utilized for accurately monitoring the amount of water obtained from the proposed source on a daily basis, and how such data will be recorded, maintained, and reported. Monitoring activities will be performed as detailed below and in accordance with Act 220 and 25 Pa. Code Chapter 110.

Monitoring

Surface water withdrawals will be monitored with flow meters and/or flow totalizers sized to measure the anticipated range of flow rates. Installation of measuring devices will be in accordance with manufacturer's specifications. Calibration and preventative maintenance of measuring devices will be conducted per the manufacturer's recommendations. Visual inspections will be conducted prior to startup and periodically during operation to check for issues with the water well pump discharges, intake structures and end of pipe filter, flow meter, hoses, pump, piping, holding tanks, fittings, etc.

Reporting

As required under Act 220, PennEnergy will submit water use data to the Pennsylvania Department of Environmental Protection (PADEP) on a monthly basis utilizing the PADEP GreenPort System. The monthly reports will include daily total amounts for the given source. A report detailing daily withdrawals will also be provided to the Pennsylvania fish and Boat Commission (PAFBC) on a monthly basis. Installation of the pumps will be coordinated with PAFBC. The source will be registered as required under Act 220 within 30 days of first withdrawal from the source.

Recordkeeping

Flow data and support information will be recorded on a daily basis. Recorded information may include, but not be limited to the following: site, location, date, meter ID, times, flow measurements, transport volume, total daily amounts withdrawn, daily maximum rates, etc. In addition to these items, the operator will note any issues identified and corrective actions taken during the daily inspection. Calibration and preventative maintenance activities will be recorded as performed. All records will be maintained by PennEnergy for a minimum of five (5) years and will be available for PADEP review upon request.

Maximum Rate Compliance

Maximum flow rates will be provided to the PADEP within the Water Management Plan. PennEnergy will utilize flow monitoring and recording methods to verify maximum rate compliance, as applicable. Other methods may include physical constraints on equipment, meters on pumping equipment and automatic limiters which cutoff or reduce pumping rates if maximum flow rates are exceeded.

Passby

The applicable passby flow rate will be maintained during all surface water withdrawals. Withdrawals will not be made if the passby flow rate cannot be maintained. Please see Attachment F and Attachment J, section c. for a detailed discussion of how passby flow was determined. Two on-site staff gages installed and calibrated by Moody and Associates, Inc. will be used to monitor passby flow conditions. One gage is located upstream of the withdrawal point, and the other is located downstream of the withdrawal point. The stream gage calibration report is included as Attachment B. A flow reading from each gage will be required prior to each withdrawal. A measurement from the downstream gage will be collected at least hourly during withdrawal activities to confirm the flow rate downstream of the withdrawal, to ensure passby criteria are met, and to avoid cumulative impacts to downstream users. In the event that the flow in the surface water body nears passby flow conditions (i.e., above passby flow but below the sum of passby flow and the permitted withdrawal volume), the withdrawal rate will be reduced to ensure maintenance of the passby flow, and the downstream gage will be used to verify passby criteria are met. When the flow reaches the minimum passby, withdrawal will cease.

Drought Monitoring

To assure protection of surface water quantity in the area, drought conditions will be monitored for Beaver County daily via the PADEP website:

https://www.dep.pa.gov/Business/Water/PlanningConservation/Drought/Pages/default.aspx
Drought declaration stages and proposed response actions include:

- Normal Conditions — Full pumping Operation
- Drought Watch — Reduce pumping by 5%
- Drought Warning — Reduce pumping by 15%
- Drought Emergency — Cease pumping

When drought conditions are lifted, graduated consumption will resume.

Coordination of Information Regarding Source Initiation

In order to assist the PADEP in responding to public inquiries, PennEnergy will provide notification to the appropriate PADEP regional office prior to the first use of an approved source. This notification will consist of either an oral or e-mail notice, and will take place at **least 48-hours prior to the first withdrawal at each approved source.**

Attachment B

Stream Gage Calibration Report

May 1, 2023

Mr. Richard Watson
PennEnergy Resources, LLC
1000 Commerce Drive
Park Place One, Suite 400
Pittsburgh, PA 15275

RE: PennEnergy Resources, LLC
Big Sewickley Creek Withdrawal
Upstream and Downstream Staff Gages:
Installation and Calibration

Introduction:

On August 25, 2021, Moody & Associates, Inc. (Moody), on behalf of PennEnergy Resources, LLC (PennEnergy) was on site of the PennEnergy Big Sewickley Creek withdrawal location (Site) to install a staff gage and collect the data necessary to calculate discharge of Big Sewickley Creek at the location of the staff gage. The staff gage was installed as a means to monitor discharge rates and to ensure passby condition are maintained on Big Sewickley Creek.

The Site is located in Economy Borough, Beaver County, Pennsylvania within a drainage basin of 17 square miles that extends through southeastern Beaver and northwestern Allegheny counties. According to USGS StreamStats, the basin receives a mean annual precipitation of 37 inches and has a mean average flow of 21.6 cubic feet per second. FIGURE 1 is a portion of the Ambridge, PA United States Geological Survey (USGS) 7.5-minute topographic quadrangles illustrating the withdrawal location. The gage is located approximately 150 feet upstream of the withdrawal point, at 40.609474° N, 80.179823° W.

On August 17, 2022, Moody installed a second staff gage approximately 50 feet downstream of the withdrawal point, at 40.60901° N, 80.18024° W. FIGURE 2 is an aerial map detailing the site layout and the locations of the staff gages and withdrawal point in Big Sewickley Creek. ATTACHMENT 1 contains photographs showing the location of the staff gages. The calibration of the downstream gage started with an initial measurement on August 17, 2022, and is ongoing. A total of 26 measurements were collected for the upstream gage (10 initial measurements, plus 16 additional measurements collected during the calibration of the downstream gage). A total of 17 measurements have been collected for the downstream gage, and it is anticipated as of the

time of this report that an additional 3 measurements will be collected spanning a varying range of flows, while focusing on the range from passby to full available withdrawal volumes. An addendum to this report will be submitted once the calibration of the downstream gage is complete.

Methodology:

For each stream flow measurement event, a measuring tape was suspended across the stream utilizing two transect points on the north and south banks of Big Sewickley Creek. The measuring tape was installed perpendicular to the flow direction at the location of the staff gage, and a level was used to ensure accuracy of width measurements. Velocity and stream depth were then measured across the cross-sectional area of each one-foot segment along the line.

One velocity measurement was taken from each one-foot segment at 60 percent of the total depth from the water surface at each point. Stream velocities were collected using a Greyline Instruments, Inc. Stingray Level-Velocity Logger.

The cross-sectional area of each of the one-foot stream segments was calculated by multiplying depth by width. Discharge was then calculated in each cross-sectional segment by multiplying the cross-sectional area by velocity, assuming a flat surface for each segment. The total discharge rate of the stream was then calculated by adding the calculated discharge of each of the segments. Twenty-six measurements were collected for the upstream gage between September 9, 2021 and April 13, 2023, under varying flow regimes, with discharges ranging from 3.2 ft^3/sec to 79.1 ft^3/sec. As of the writing of this report, 17 measurements have been collected for the downstream gage between August 17, 2022 and April 13, 2023. The measurements were collected for discharges ranging from 3.2 ft^3/sec to 79.1 ft^3/sec. TABLE 1 contains the calculated discharge and the measured stage for each measurement event.

Precipitation data was downloaded from the United States Department of Commerce National Oceanic and Atmospheric Administration (NOAA) for the calibration period through January 6, 2023. This data was used to interpret the rate of stream stage rise when precipitation events occur, as well as correlating stage and discharge with the amount of precipitation. The precipitation data was recorded at the Pittsburgh International Airport Weather Station, located in Pittsburgh, Pennsylvania. The station is approximately 8.5 miles southwest from the Site.

Results/Discussion:

ATTACHMENT 2 contains the data sheets showing stage and discharge measurements for each site visit. FIGURE 3 and FIGURE 3A contain stage and precipitation data. Observations made in

the field during the calibration period suggest that Big Sewickley Creek is "flashy" at times of high or prolonged precipitation, then slowly falls.

TABLE 1 contains the calculated discharge and the measured stage for each measurement event based on the data collected. FIGURE 4 contains the data for both the upstream gage discharge curve and the downstream gage discharge curve plotted on a stage-discharge relation graph. The curves illustrated on FIGURE 4 serve to calibrate the staff gages. The calibration curves were extrapolated to fully encompass the range of any future observations. The curve allows discharge values to be accurately estimated based solely on stage height measured by the staff gage. The proposed passby rates of 6.5 and 10.8 cubic feet per second have been plotted. Using these passby rates, water withdrawals must cease when the stage of Big Sewickley Creek as measured on the downstream gage is less than or equal to 0.96 feet in October through March, and 1.05 feet in April through September.

Conclusions:

Observing the precipitation and stage data over the calibration period, a pattern of rapid rises in stage followed by cessation can be interpreted. This suggests Big Sewickley Creek is "flashy" at times of high or prolonged precipitation, then slowly falls. As the stream stage, as measured on the downstream gage, fall below 1.02 feet but is above 0.96 foot in October through March, or falls below 1.09 feet but is above 1.05 feet in April through September, the withdrawal rate should be reduced to maintain a stream flow of not less than the corresponding passby level (0.96 foot and 1.05 feet for the October through March and April through September periods, respectively). When the stream stage falls below 0.96 feet in October through March or 1.05 feet in April through September at the downstream gage location, all pumping should cease.

If you have any questions regarding the information presented above, please do not hesitate to contact us.

Sincerely,
Moody and Associates, Inc.

Paul J. Martin, P.G.
Project Manager

FIGURES

Legend

- Withdrawal Point

Scale:
1 in = 2,000 ft

0 1,000 2,000
Feet

Prepared for:
PENNENERGY RESOURCES

Map Reference:

Basemap: ESRI Basemap,
USA Topo Maps
USGS Topographic 7.5' Quadrangle:
Ambridge, PA

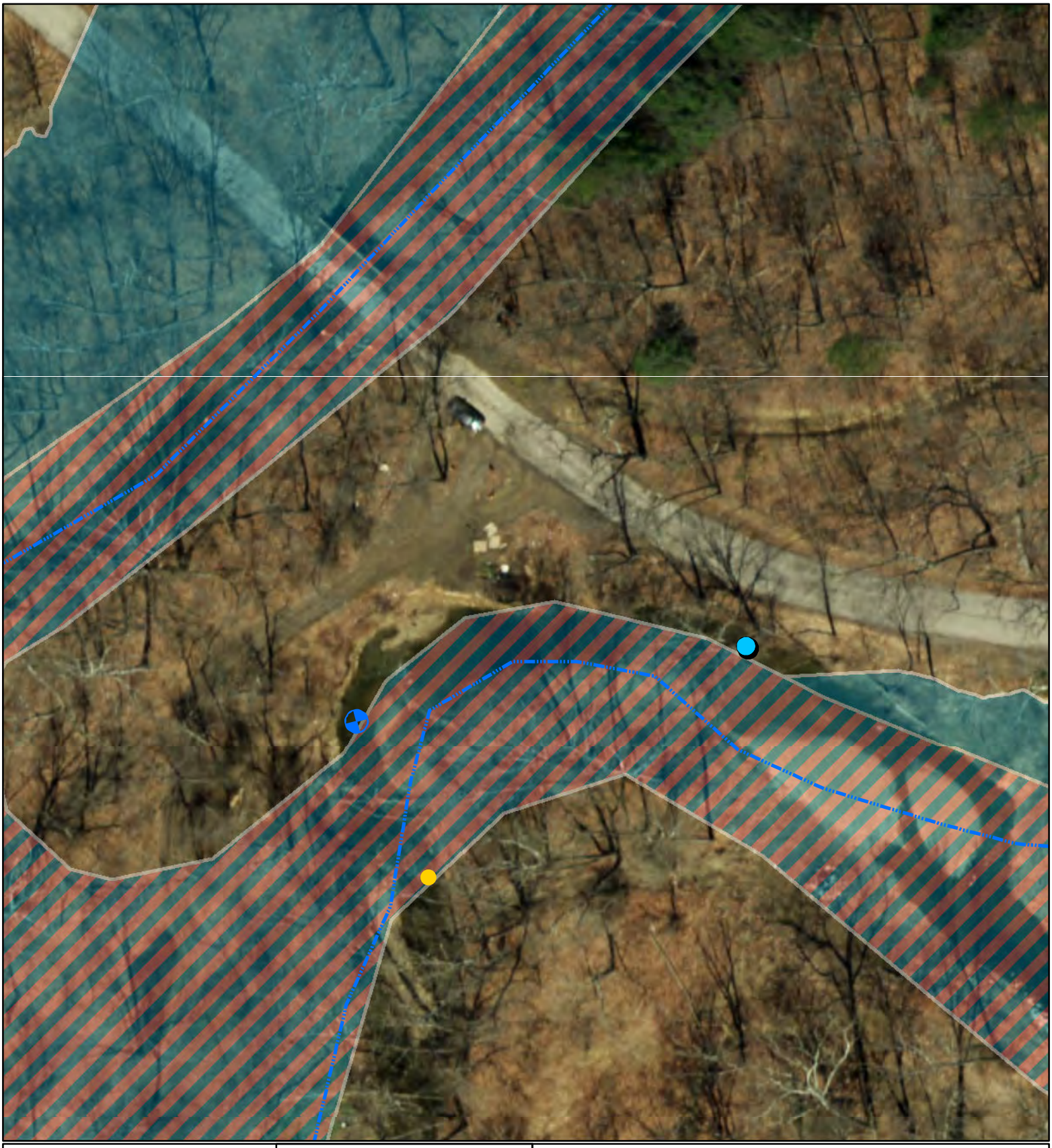
Projected Coordinate System:
NAD_1983_StatePlane_Pennsylvania_South
_FIPS_3702_Feet

FIGURE 1
Withdrawal Location Map
Big Sewickley Creek
Beaver County, Pittsburgh, PA

Project #: 12-115-CO

Drawn by:	Checked by:	Date:	Revision:
CJB	JWB	5/18/2021	0

11548 Cotton Road
Suite 101
Meadville, Pa 16335
814.724.4970 voice
814.724.4973 fax
www.moody-s.com
Moody AND ASSOCIATES, INC.



FEMA Special Flood Hazard Areas

- Zone AE
- Floodway
- Stream Profile Baseline
- Surface Intake
- Upstream Gage Location
- Downstream Gage Location

Scale: 1 in = 50 ft

0 25 50

Feet

Prepared for:

PENNENERGY RESOURCES

Map Reference:

Basemap: ArcGIS Map Service https://imagery.pasda.psu.edu/ArcGIS/services/pasda/PEMAImagery2018

Flood Data: National Flood Hazard Layer - Beaver County, 2019 - Federal Emergency Management Agency,https://maps.pasda.psu.edu/ArcGIS/rest/services/pasda/FEMA_NationalFloodHazardLayer_PA/MapServer

NAD_1983_StatePlane_Pennsylvania_South_FIPS_3702_Feet

FIGURE 2
INTAKE & GAGE LOCATION MAP

PennEnergy Resources, LLC
North Fork Big Sewickley Creek Intake
New Sewickley Township, Beaver County, PA

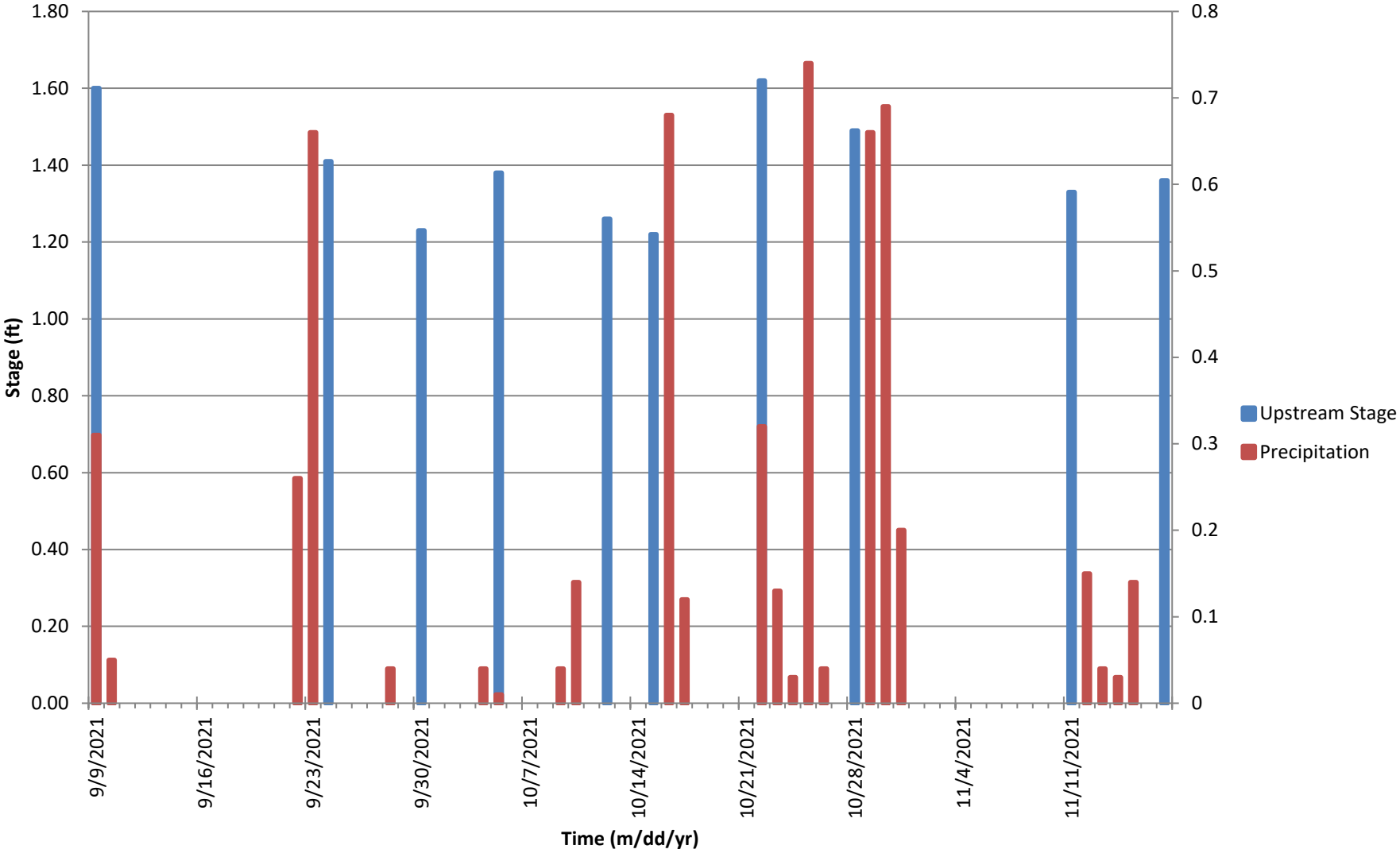
Project #: 12-115-CO

Drawn by:	Checked by:	Date:	Revision:
CJB	PJM	9/21/2022	2

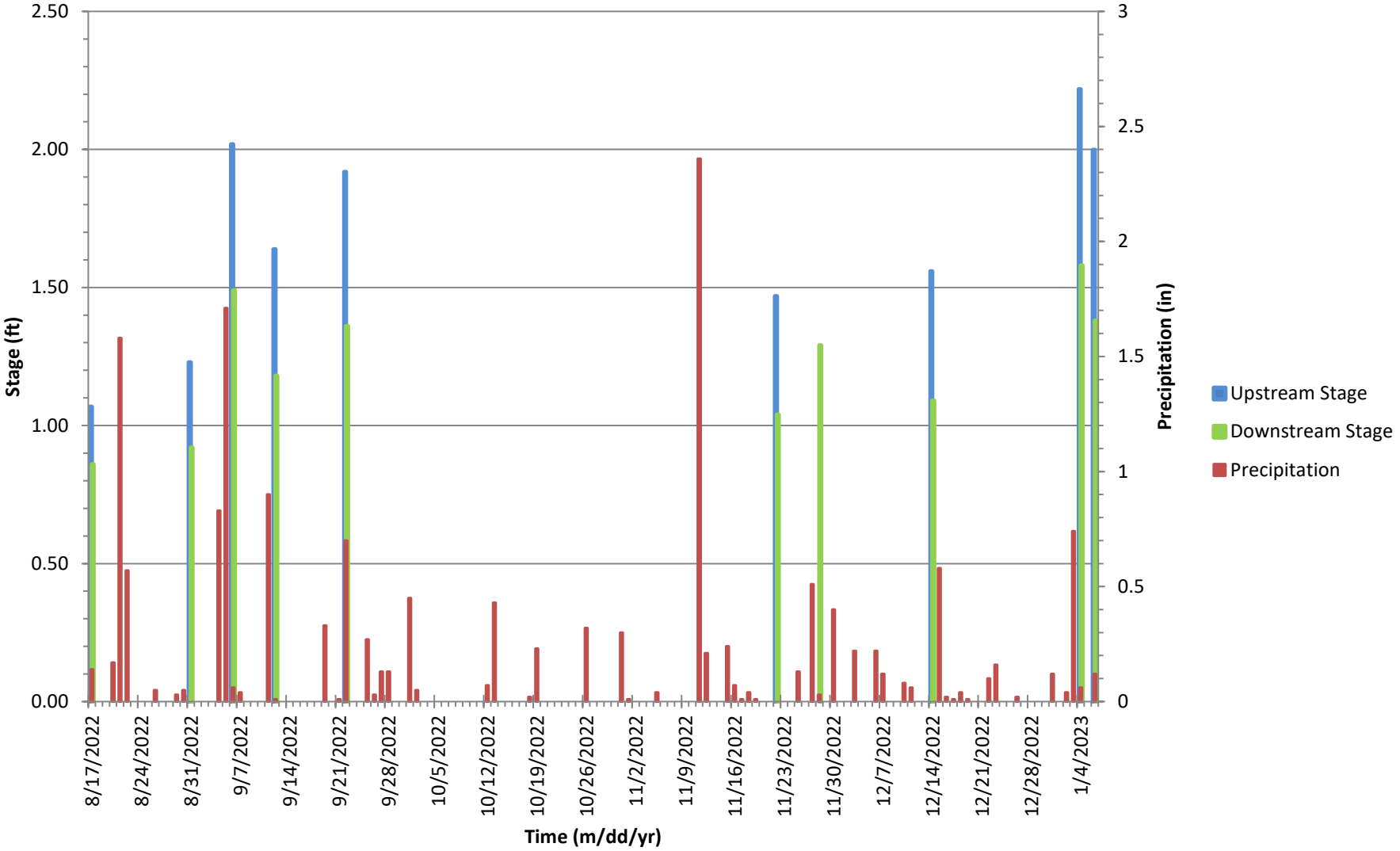
11548 Cotton Road
Suite 101
Meadville, Pa 16335
814.724.4970 voice
814.724.4973 fax
www.moody-s.com

Moody AND ASSOCIATES, INC.

Big Sewickley Creek Gaging Station
Economy Borough, Beaver County, Pennsylvania
FIGURE 3 - Stage and Precipitation 9/9/21 - 11/17/21

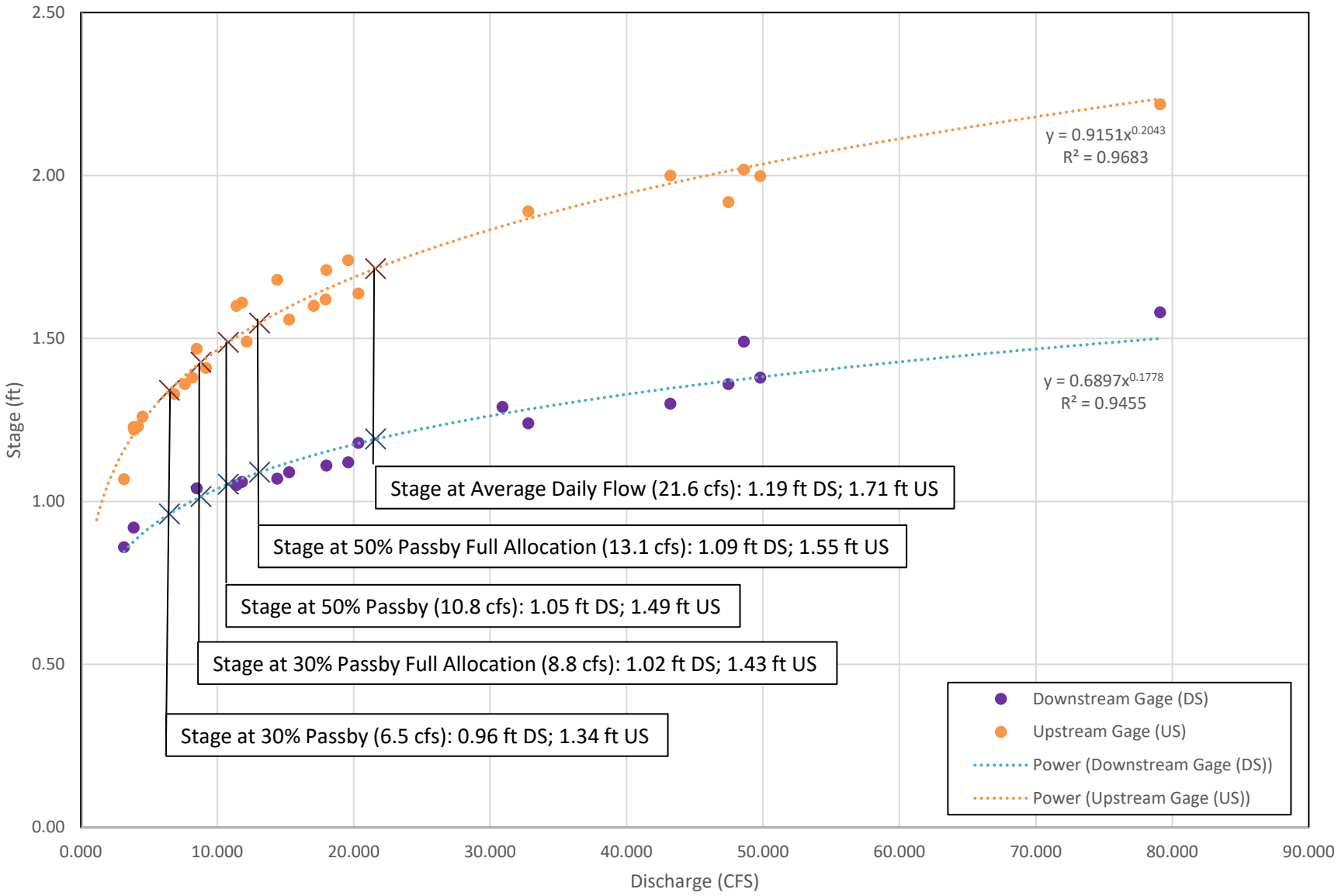


Big Sewickley Creek Gaging Station
Economy Borough, Beaver County, Pennsylvania
FIGURE 3A - Stage and Precipitation 8/17/22 - 1/6/23



Big Sewickley Creek Stream Gage Calibration

FIGURE 4: Upstream and Downstream Gage Calibration Curves



TABLE

PennEnergy Resources, LLC
Big Sewickley Creek Withdrawal

Table 1 - Discharge and Stage Data

Date	Discharge (cu ft/s)	Upstream Stage (ft)	Downstream Stage (ft)
9/9/2021	17.066	1.6	
9/24/2021	9.164	1.41	
9/30/2021	4.182	1.23	
10/5/2021	8.174	1.38	
10/12/2021	4.532	1.26	
10/15/2021	3.908	1.22	
10/22/2021	17.938	1.62	
10/28/2021	12.156	1.49	
11/11/2021	6.838	1.33	
11/17/2021	7.63	1.36	
8/17/2022	3.2	1.07	0.86
8/31/2022	3.9	1.23	0.92
9/6/2022	48.6	2.02	1.49
9/12/2022	20.4	1.64	1.18
9/22/2022	47.5	1.92	1.36
11/22/2022	8.5	1.47	1.04
11/28/2022	30.9		1.29
12/14/2022	15.3	1.56	1.09
1/4/2023	79.1	2.22	1.58
1/6/2023	49.8	2.00	1.38
3/2/2023	32.8	1.89	1.24
3/13/2023	19.6	1.74	1.12
3/17/2023	18.0	1.71	1.11
3/21/2023	11.8	1.61	1.06
3/22/2023	11.4	1.60	1.05
3/31/2023	43.2	2.00	1.30
4/13/2023	14	1.68	1.07

ATTACHMENT 1

Close-up view of upstream staff gage.

Moody AND ASSOCIATES, INC.

View of upstream staff gage.

Moody AND ASSOCIATES, INC.

South bank transect point.

Moody AND ASSOCIATES, INC.

North bank transect point.

Moody AND ASSOCIATES, INC.

View of downstream staff gage.

Moody AND ASSOCIATES, INC.

Close-up view of downstream staff gage.

Moody AND ASSOCIATES, INC.

ATTACHMENT 2

BSC - Stream Measurements

Date:	9/9/2021		Work Performed By: JWB & ZR		
Stage:	**1.60 ft**		Discharge:	**17.066 cu ft/s**	
Marker on Tape Measure (ft)	Width (ft)	Depth (ft)	Velocity (ft/sec)	Comments	Segmented discharges (cft/sec)
1	1			Depth & Velocity NM	0
2	1			Depth & Velocity NM	0
3	1			Depth & Velocity NM	0
4	1			Depth & Velocity NM	0
5	1			Depth & Velocity NM	0
6	1			Depth & Velocity NM	0
7	1			Depth & Velocity NM	0
8	1			Depth & Velocity NM	0
9	1			Depth & Velocity NM	0
10	1			Depth & Velocity NM	0
11	1			Depth & Velocity NM	0
12	1			Depth & Velocity NM	0
13	1	0.18	0		0
14	1	0.23	0		0
15	1	0.2	0		0
16	1	0.31	0		0
17	1	0.26	0		0
18	1	0.22	0		0
19	1	0	0		0
20	1	0.00	0.0		0
21	1	0	0		0
22	1	0.26	0.6		0.156
23	1	0.34	1		0.34
24	1	0.52	2		1.04
25	1	0.73	2.6		1.898
26	1	0.8	3		2.4
27	1	0.84	3		2.52
28	1	0.89	3.4		3.026
29	1	0.84	3		2.52
30	1	0.77	2.2		1.694
31	1	0.74	1.8		1.332
32	1	0.52	0.2		0.104
33	1	0.18	0.2		0.036

BSC - Stream Measurements

Date:	9/24/2021		Work Performed By: JWB & ZR		
Stage:	**1.41 ft**		Discharge:		**9.164 cu ft/s**
Marker on Tape Measure (ft)	Width (ft)	Depth (ft)	Velocity (ft/sec)	Comments	Segmented discharges (cft/sec)
1	1	0	0		0
2	1	0	0		0
3	1	0	0		0
4	1	0	0		0
5	1	0	0		0
6	1	0	0		0
7	1	0	0		0
8	1	0	0		0
9	1	0	0		0
10	1	0	0		0
11	1	0	0		0
12	1	0	0		0
13	1	0	0		0
14	1	0	0		0
15	1	0	0		0
16	1	0	0		0
17	1	0	0		0
18	1	0	0		0
19	1	0	0		0
20	1	0	0		0
21	1	0	0		0
22	1	0	0		0
23	1	0.09	0.2		0.018
24	1	0.23	0.4		0.092
25	1	0.4	0.8		0.32
26	1	0.46	1.6		0.736
27	1	0.64	2		1.28
28	1	0.68	2.2		1.496
29	1	0.73	2.6		1.898
30	1	0.68	2.6		1.768
31	1	0.6	1.8		1.08
32	1	0.5	0.8		0.4
33	1	0.38	0.2		0.076

BSC - Stream Measurements

Date:	9/30/2021		Work Performed By: JWB & ZR		
Stage:	**1.23 ft**		Discharge:		**4.182 cu ft/s**
Marker on Tape Measure (ft)	Width (ft)	Depth (ft)	Velocity (ft/sec)	Comments	Segmented discharges (cft/sec)
1	1	0	0		0
2	1	0	0		0
3	1	0	0		0
4	1	0	0		0
5	1	0	0		0
6	1	0	0		0
7	1	0	0		0
8	1	0	0		0
9	1	0	0		0
10	1	0	0		0
11	1	0	0		0
12	1	0	0		0
13	1	0	0		0
14	1	0	0		0
15	1	0	0		0
16	1	0	0		0
17	1	0	0		0
18	1	0	0		0
19	1	0	0		0
20	1	0	0		0
21	1	0	0		0
22	1	0	0		0
23	1	0.2	0.2		0.04
24	1	0.3	1.4		0.42
25	1	0.42	1.8		0.756
26	1	0.49	1.6		0.784
27	1	0.53	1.8		0.954
28	1	0.44	1.8		0.792
29	1	0.32	1.2		0.384
30	1	0.26	0.2		0.052
31	1	0.18	0		0
32	1	0	0		0
33	1	0	0		0

BSC - Stream Measurements

Date:	10/5/2021		Work Performed By: JWB & ZR		
Stage:	**1.38 ft**		Discharge:		**8.174 cu ft/s**
Marker on Tape Measure (ft)	Width (ft)	Depth (ft)	Velocity (ft/sec)	Comments	Segmented discharges (cft/sec)
1	1	0	0		0
2	1	0	0		0
3	1	0	0		0
4	1	0	0		0
5	1	0	0		0
6	1	0	0		0
7	1	0	0		0
8	1	0	0		0
9	1	0	0		0
10	1	0	0		0
11	1	0	0		0
12	1	0	0		0
13	1	0	0		0
14	1	0	0		0
15	1	0	0		0
16	1	0	0		0
17	1	0	0		0
18	1	0	0		0
19	1	0	0		0
20	1	0	0		0
21	1	0	0		0
22	1	0.14	0.2		0.028
23	1	0.28	1		0.28
24	1	0.45	1.6		0.72
25	1	0.6	2		1.2
26	1	0.66	2.2		1.452
27	1	0.72	2.4		1.728
28	1	0.59	2.8		1.652
29	1	0.48	1.6		0.768
30	1	0.36	0.8		0.288
31	1	0.29	0.2		0.058
32	1	0	0		0
33	1	0	0		0

BSC - Stream Measurements

Date:	10/12/2021		Work Performed By: JWB & ZR		
Stage:	**1.26 ft**		Discharge:		**4.532 cu ft/s**
Marker on Tape Measure (ft)	Width (ft)	Depth (ft)	Velocity (ft/sec)	Comments	Segmented discharges (cft/sec)
1	1	0	0		0
2	1	0	0		0
3	1	0	0		0
4	1	0	0		0
5	1	0	0		0
6	1	0	0		0
7	1	0	0		0
8	1	0	0		0
9	1	0	0		0
10	1	0	0		0
11	1	0	0		0
12	1	0	0		0
13	1	0	0		0
14	1	0	0		0
15	1	0	0		0
16	1	0	0		0
17	1	0	0		0
18	1	0	0		0
19	1	0	0		0
20	1	0	0		0
21	1	0	0		0
22	1	0	0		0
23	1	0.1	0		0
24	1	0.23	0.6		0.138
25	1	0.32	1.4		0.448
26	1	0.47	1.2		0.564
27	1	0.54	1.8		0.972
28	1	0.56	2		1.12
29	1	0.42	1.8		0.756
30	1	0.34	1.2		0.408
31	1	0.43	0.2		0.086
32	1	0.2	0.2		0.04
33	1	0	0		0

BSC - Stream Measurements

Date:	10/15/2021		Work Performed By: JWB & ZR		
Stage:	**1.22 ft**		Discharge:		**3.908 cu ft/s**
Marker on Tape Measure (ft)	Width (ft)	Depth (ft)	Velocity (ft/sec)	Comments	Segmented discharges (cft/sec)
1	1	0	0		0
2	1	0	0		0
3	1	0	0		0
4	1	0	0		0
5	1	0	0		0
6	1	0	0		0
7	1	0	0		0
8	1	0	0		0
9	1	0	0		0
10	1	0	0		0
11	1	0	0		0
12	1	0	0		0
13	1	0	0		0
14	1	0	0		0
15	1	0	0		0
16	1	0	0		0
17	1	0	0		0
18	1	0	0		0
19	1	0	0		0
20	1	0	0		0
21	1	0	0		0
22	1	0	0		0
23	1	0.09	0		0
24	1	0.22	0.4		0.088
25	1	0.3	1.2		0.36
26	1	0.44	1.6		0.704
27	1	0.52	1.8		0.936
28	1	0.53	1.8		0.954
29	1	0.52	1.4		0.728
30	1	0.38	0.2		0.076
31	1	0.31	0.2		0.062
32	1	0.2	0		0
33	1	0	0		0

BSC - Stream Measurements

Date:	10/22/2021		Work Performed By: JWB & DJM		
Stage:	**1.62 ft**		Discharge:	**17.938 cu ft/s**	
Marker on Tape Measure (ft)	Width (ft)	Depth (ft)	Velocity (ft/sec)	Comments	Segmented discharges (cft/sec)
1	1	0	0		0
2	1	0	0		0
3	1	0	0		0
4	1	0	0		0
5	1	0	0		0
6	1	0	0		0
7	1	0	0		0
8	1	0	0		0
9	1	0	0		0
10	1	0	0		0
11	1	0	0		0
12	1	0	0		0
13	1	0	0		0
14	1	0	0		0
15	1	0	0		0
16	1	0	0		0
17	1	0	0		0
18	1	0	0		0
19	1	0	0		0
20	1	0	0		0
21	1	0.07	0.2		0.014
22	1	0.2	0.4		0.08
23	1	0.33	1.4		0.462
24	1	0.54	2.6		1.404
25	1	0.73	2.8		2.044
26	1	0.82	3		2.46
27	1	0.95	3		2.85
28	1	0.93	3		2.79
29	1	0.95	3.2		3.04
30	1	0.7	2.4		1.68
31	1	0.63	1.6		1.008
32	1	0.53	0.2		0.106
33	1	0	0		0

BSC - Stream Measurements

Date:	10/28/2021	Work Performed By: JWB & DJM			
Stage:	**1.49 ft**		Discharge:	**12.156 cu ft/s**	
Marker on Tape Measure (ft)	Width (ft)	Depth (ft)	Velocity (ft/sec)	Comments	Segmented discharges (cft/sec)
1	1	0	0		0
2	1	0	0		0
3	1	0	0		0
4	1	0	0		0
5	1	0	0		0
6	1	0	0		0
7	1	0	0		0
8	1	0	0		0
9	1	0	0		0
10	1	0	0		0
11	1	0	0		0
12	1	0	0		0
13	1	0	0		0
14	1	0	0		0
15	1	0	0		0
16	1	0	0		0
17	1	0	0		0
18	1	0	0		0
19	1	0	0		0
20	1	0	0		0
21	1				0
22	1	0.14	0.2		0.028
23	1	0.21	0.2		0.042
24	1	0.35	2		0.7
25	1	0.45	2.8		1.26
26	1	0.57	2.6		1.482
27	1	0.72	2.2		1.584
28	1	0.83	2.8		2.324
29	1	0.78	3		2.34
30	1	0.54	2.6		1.404
31	1	0.57	1.6		0.912
32	1	0.4	0.2		0.08
33	1	0	0		0

BSC - Stream Measurements

Date:	11/11/2021		Work Performed By: JWB & ZR		
Stage:	**1.33 ft**		Discharge:		**6.838 cu ft/s**
Marker on Tape Measure (ft)	Width (ft)	Depth (ft)	Velocity (ft/sec)	Comments	Segmented discharges (cft/sec)
1	1	0	0		0
2	1	0	0		0
3	1	0	0		0
4	1	0	0		0
5	1	0	0		0
6	1	0	0		0
7	1	0	0		0
8	1	0	0		0
9	1	0	0		0
10	1	0	0		0
11	1	0.23	0.4		0.092
12	1	0.30	0.4		0.12
13	1	0.21	1.4		0.294
14	1	0.28	0.6		0.168
15	1	0.29	1.4		0.406
16	1	0.30	1.2		0.36
17	1	0.28	1.2		0.336
18	1	0.28	1.4		0.392
19	1	0.18	1.6		0.288
20	1	0.00	0.0		0
21	1				0
22	1				0
23	1				0
24	1				0
25	1				0
26	1	0.18	0.2		0.036
27	1	0.31	1.4		0.434
28	1	0.35	1.4		0.49
29	1	0.55	1.2		0.66
30	1	0.67	2		1.34
31	1	0.73	1.8		1.314
32	1	0.54	0.2		0.108
33	1	0	0		0

BSC - Stream Measurements

Date:	11/17/2021		Work Performed By: JWB & ZR		
Stage:	**1.36 ft**		Discharge:		**7.63 cu ft/s**
Marker on Tape Measure (ft)	Width (ft)	Depth (ft)	Velocity (ft/sec)	Comments	Segmented discharges (cft/sec)
1	1	0	0		0
2	1	0	0		0
3	1	0	0		0
4	1	0	0		0
5	1	0	0		0
6	1	0	0		0
7	1	0	0		0
8	1	0	0		0
9	1	0	0		0
10	1	0.1	0.2		0.02
11	1	0.24	0.2		0.048
12	1	0.31	0.6		0.186
13	1	0.29	1.6		0.464
14	1	0.25	1.6		0.4
15	1	0.30	1.6		0.48
16	1	0.30	1.4		0.42
17	1	0.31	1.2		0.372
18	1	0.25	1.2		0.3
19	1	0.21	1.4		0.294
20	1	0.10	0.2		0.02
21	1				0
22	1				0
23	1				0
24	1				0
25	1	0.08	0.2		0.016
26	1	0.23	0.4		0.092
27	1	0.3	1.8		0.54
28	1	0.35	2		0.7
29	1	0.47	1.4		0.658
30	1	0.68	2		1.36
31	1	0.72	1.6		1.152
32	1	0.54	0.2		0.108
33	1	0	0		0

BSC Downstream Measurements

Date:	8/17/2022		Work Performed By: PM & AR		
Upstream Stage:	**1.07 ft**				
Downstream Stage:	**0.86 ft**		Discharge:		**3.2 cu ft/s**
Marker on Tape Measure (ft)	Width (ft)	Depth (ft)	Velocity (ft/sec)	Comments	Segmented discharges (cft/sec)
1				Depth & Velocity NM	0
2				Depth & Velocity NM	0
3				Depth & Velocity NM	0
4	1	0.15	0.4		0.06
5	1	0.20	0.6		0.12
6	1	0.35	0.8		0.28
7	1	0.38	1		0.38
8	1	0.48	1		0.48
9	1	0.53	0.8		0.424
10	1	0.46	1.2		0.552
11	1	0.28	0.8		0.224
12	1	0.25	0.4		0.1
13	1	0.22	0.8		0.176
14	1	0.25	0.6		0.15
15	1	0.26	0.4		0.104
16	1	0.23	0.4		0.092
17	1	0.1	0.2		0.02

BSC Downstream Measurements

Date:	8/31/2022		Work Performed By: PM & AR		
Upstream Stage:	**1.23 ft**				
Downstream Stage:	**0.92 ft**		Discharge:		**3.9 cu ft/s**
Marker on Tape Measure (ft)	Width (ft)	Depth (ft)	Velocity (ft/sec)	Comments	Segmented discharges (cft/sec)
1				Depth & Velocity NM	0
2				Depth & Velocity NM	0
3				Depth & Velocity NM	0
4	1	0.21	0.4	0.4	0.084
5	1	0.37	0.6	0.6	0.222
6	1	0.42	0.8	0.8	0.336
7	1	0.44	1	1.2	0.44
8	1	0.59	1	1.2	0.59
9	1	0.58	0.8	1.2	0.464
10	1	0.53	1.2	1	0.636
11	1	0.34	0.8	0.8	0.272
12	1	0.33	0.4	0.8	0.132
13	1	0.31	0.8	0.8	0.248
14	1	0.32	0.6	1	0.192
15	1	0.23	0.4	0.6	0.092
16	1	0.28	0.4	0.4	0.112
17	1	0.27	0.2	0.4	0.054

BSC Downstream Measurements

Date:	9/6/2022		Work Performed By: ZR & AR		
Upstream Stage:	**2.02 ft**				
Downstream Stage:	**1.49 ft**		Discharge:		**48.6 cu ft/s**
Marker on Tape Measure (ft)	Width (ft)	Depth (ft)	Velocity (ft/sec)	Comments	Segmented discharges (cft/sec)
1	1	0.63	2	Depth & Velocity NM	1.26
2	1	1	1.8	Depth & Velocity NM	1.8
3	1	1.23	2.4	Depth & Velocity NM	2.952
4	1	1.21	2.2		2.662
5	1	1.41	2.2		3.102
6	1	1.3	2.2		2.86
7	1	1.57	1.2		1.884
8	1	1.61	2.8		4.508
9	1	1.53	3		4.59
10	1	1.42	2.4		3.408
11	1	1.31	1.8		2.358
12	1	1.24	2.4		2.976
13	1	1.15	3.2		3.68
14	1	1.08	3		3.24
15	1	0.99	2		1.98
16	1	0.85	2.4		2.04
17	1	0.88	0.8		0.704
18	1	0.67	2.4		1.608
19	1	0.42	1.8		0.756
20	1	0.23	0.6		0.138
21	1	0.23	0.4		0.092

BSC Downstream Measurements

Date:	9/12/2022		Work Performed By: ZR & AR		
Upstream Stage:	**1.64 ft**				
Downstream Stage:	**1.18 ft**		Discharge:		**20.4 cu ft/s**
Marker on Tape Measure (ft)	Width (ft)	Depth (ft)	Velocity (ft/sec)	Comments	Segmented discharges (cft/sec)
1	1	0.36	0.8		0.288
2	1	0.58	1		0.58
3	1	0.71	1.4		0.994
4	1	0.75	1.4		1.05
5	1	0.83	2.4		1.992
6	1	0.93	2.4		2.232
7	1	1.01	2.2		2.222
8	1	1.06	2		2.12
9	1	1	1.8		1.8
10	1	0.84	1.8		1.512
11	1	0.74	1.8		1.332
12	1	0.69	1.8		1.242
13	1	0.62	1.6		0.992
14	1	0.5	1.4		0.7
15	1	0.41	1.4		0.574
16	1	0.36	1		0.36
17	1	0.36	1		0.36
18	1	0.1		Depth & Velocity NM	0
19	1				0
20	1				0
21	1				0

BSC Downstream Measurements

Date:	9/12/2022		Work Performed By: ZR & AR		
Upstream Stage:	**1.92 ft**				
Downstream Stage:	**1.36 ft**		Discharge:		**47.5 cu ft/s**
Marker on Tape Measure (ft)	Width (ft)	Depth (ft)	Velocity (ft/sec)	Comments	Segmented discharges (cft/sec)
1	1	0.21	0.4		0.084
2	1	0.38	0.6		0.228
3	1	0.56	0.8		0.448
4	1	0.71	2.0		1.42
5	1	0.76	2.6		1.976
6	1	0.88	2.6		2.288
7	1	0.94	2.6		2.444
8	1	0.97	2.6		2.522
9	1	1.09	3.2		3.488
10	1	1.1	3.0		3.3
11	1	1.18	3.2		3.776
12	1	1.37	3.0		4.11
13	1	1.34	2.8		3.752
14	1	1.31	2.8		3.668
15	1	1.21	3.0		3.63
16	1	1.15	2.8		3.22
17	1	1.12	2.8		3.136
18	1	1	2.6		2.6
19	1	0.6	1.8		1.08
20	1	0.37	0.8		0.296
21	1				0

BSC Downstream Measurements

Date:	11/22/2022		Work Performed By: EE & AR		
Upstream Stage:	**1.47 ft**				
Downstream Stage:	**1.04 ft**		Discharge:		**8.5 cu ft/s**
Marker on Tape Measure (ft)	Width (ft)	Depth (ft)	Velocity (ft/sec)	Comments	Segmented discharges (cft/sec)
1	1	0.2	0.2		0.04
2	1	0.38	0.2		0.076
3	1	0.45	0.2		0.09
4	1	0.44	1.4		0.616
5	1	0.52	1.4		0.728
6	1	0.67	1.4		0.938
7	1	0.59	1.0		0.59
8	1	0.59	1.0		0.59
9	1	0.67	1.6		1.072
10	1	0.64	1.6		1.024
11	1	0.71	1.4		0.994
12	1	0.62	0.8		0.496
13	1	0.58	0.8		0.464
14	1	0.57	0.4		0.228
15	1	0.62	0.8		0.496
16	1	0.3	0.2		0.06

BSC Downstream Measurements

Date:	11/28/2022		Work Performed By: ZR & AR		
Upstream Stage:	**Not Measured**				
Downstream Stage:	**1.29 ft**		Discharge:		**30.9 cu ft/s**
Marker on Tape Measure (ft)	Width (ft)	Depth (ft)	Velocity (ft/sec)	Comments	Segmented discharges (cft/sec)
1	1	0.15	0.2		0.03
2	1	0.3	0.2		0.06
3	1	0.41	0.2		0.082
4	1	0.57	0.4		0.228
5	1	0.74	1.2		0.888
6	1	0.84	1.4		1.176
7	1	0.88	2.4		2.112
8	1	0.86	2.8		2.408
9	1	0.95	3.8		3.61
10	1	0.93	3.0		2.79
11	1	1	2.6		2.6
12	1	1.03	2.2		2.266
13	1	1.01	2.2		2.222
14	1	1.02	2.4		2.448
15	1	0.86	2.4		2.064
16	1	0.93	2		1.86
17	1	0.89	1.8		1.602
18	1	0.95	1.6		1.52
19	1	0.61	1.2		0.732
20	1	0.33	0.6		0.198

BSC Downstream Measurements

Date:	12/14/2022		Work Performed By: ZR & AR		
Upstream Stage:	**1.56 ft**				
Downstream Stage:	**1.09 ft**		Discharge:		**15.3 cu ft/s**
Marker on Tape Measure (ft)	Width (ft)	Depth (ft)	Velocity (ft/sec)	Comments	Segmented discharges (cft/sec)
1	0.8	0.2	0.2		0.032
2	0.8	0.33	0.2		0.0528
3	0.8	0.51	0.2		0.0816
4	0.8	0.61	0.2		0.0976
5	0.8	0.62	0.2		0.0992
6	0.8	0.54	1.2		0.5184
7	0.8	0.75	3.6		2.16
8	0.8	0.77	2.6		1.6016
9	0.8	0.73	2.0		1.168
10	0.8	0.72	0.2		0.1152
11	0.8	0.74	2.0		1.184
12	0.8	0.79	2.2		1.3904
13	0.8	0.75	1.8		1.08
14	0.8	0.82	2.0		1.312
15	0.8	0.76	2.0		1.216
16	0.8	0.7	1.8		1.008
17	0.8	0.68	1.0		0.544
18	0.8	0.59	1.0		0.472
19	0.8	0.76	0.6		0.3648
20	0.8	0.67	0.6		0.3216
21	0.8	0.53	0.8		0.3392
22	0.8	0.23	0.6		0.1104

BSC Downstream Measurements

Date:	1/4/2023		Work Performed By: KH & AR		
Upstream Stage:	**2.22 ft**				
Downstream Stage:	**1.58 ft**		Discharge:		**79.1 cu ft/s**
Marker on Tape Measure (ft)	Width (ft)	Depth (ft)	Velocity (ft/sec)	Comments	Segmented discharges (cft/sec)
1	1	0.52	1.4		0.728
2	1	0.80	2.4		1.92
3	1	1.30	3.0		3.9
4	1	1.38	3.2		4.416
5	1	1.40	3.0		4.2
6	1	1.35	3.2		4.32
7	1	1.37	3.2		4.384
8	1	1.45	2.6		3.77
9	1	1.49	2.8		4.172
10	1	1.62	3.0		4.86
11	1	1.60	3.4		5.44
12	1	1.51	3.0		4.53
13	1	1.45	3.0		4.35
14	1	1.55	3.0		4.65
15	1	1.50	3.8		5.7
16	1	1.42	3.8		5.396
17	1	1.30	3.2		4.16
18	1	1.02	2.6		2.652
19	1	0.81	2.8		2.268
20	1	0.70	2.2		1.54
21	1	0.45	2.0		0.9
22	1	0.42	1.6		0.672
23	1	0.25	0.6		0.15
24	1	0.15	0.2		0.03

BSC Downstream Measurements

Date:	1/6/2023		Work Performed By: KH & AR		
Upstream Stage:	**2.00 ft**				
Downstream Stage:	**1.38 ft**		Discharge:		**49.8 cu ft/s**
Marker on Tape Measure (ft)	Width (ft)	Depth (ft)	Velocity (ft/sec)	Comments	Segmented discharges (cft/sec)
1	1	0.36	1.6		0.576
2	1	0.79	2.4		1.896
3	1	0.96	2.6		2.496
4	1	1.13	3.4		3.842
5	1	1.16	3.0		3.48
6	1	1.20	3.0		3.6
7	1	1.25	2.8		3.5
8	1	1.27	2.4		3.048
9	1	1.29	2.4		3.096
10	1	1.27	3.0		3.81
11	1	1.22	3.0		3.66
12	1	1.20	3.0		3.6
13	1	1.18	3.6		4.248
14	1	0.97	3.8		3.686
15	1	1.05	2.6		2.73
16	1	0.83	1.6		1.328
17	1	0.72	1.4		1.008
18	1	0.40	0.2		0.08
19	1	0.29	0.2		0.058
20	1	0.15	0.2		0.03
21	1	0.10	0.2		0.02

BSC Downstream Measurements

Date:	3/2/2023		Work Performed By: KH & AR		
Upstream Stage:	**1.89 ft**				
Downstream Stage:	**1.24 ft**		Discharge:		**32.8 cu ft/s**
Marker on Tape Measure (ft)	Width (ft)	Depth (ft)	Velocity (ft/sec)	Comments	Segmented discharges (cft/sec)
1	1	0.22	0.8		0.176
2	1	0.59	1.8		1.062
3	1	0.81	1.8		1.458
4	1	0.94	2.4		2.256
5	1	0.85	2.6		2.21
6	1	0.97	3.0		2.91
7	1	1.02	2.8		2.856
8	1	0.98	2.6		2.548
9	1	1.08	3.0		3.24
10	1	1.10	3.2		3.52
11	1	1.00	3.4		3.4
12	1	1.05	2.8		2.94
13	1	0.98	2.6		2.548
14	1	0.82	1.4		1.148
15	1	0.76	0.2		0.152
16	1	0.63	0.4		0.252
17	1	0.35	0.2		0.07
18	1	0.18	0.2		0.036
19	1	0.10	0.2		0.02
20	1				0
21	1				0

BSC Downstream Measurements

Date:	3/13/2023		Work Performed By: KH & AR		
Upstream Stage:	**1.74 ft**				
Downstream Stage:	**1.12 ft**		Discharge:		**19.6 cu ft/s**
Marker on Tape Measure (ft)	Width (ft)	Depth (ft)	Velocity (ft/sec)	Comments	Segmented discharges (cft/sec)
1	1	0.15	0.2		0.03
2	1	0.44	1.6		0.704
3	1	0.61	1.4		0.854
4	1	0.74	1.4		1.036
5	1	0.75	2.0		1.5
6	1	0.75	2.4		1.8
7	1	0.80	2.8		2.24
8	1	0.72	3.2		2.304
9	1	0.81	3.0		2.43
10	1	0.85	2.8		2.38
11	1	0.82	2.2		1.804
12	1	0.81	1.4		1.134
13	1	0.74	1.0		0.74
14	1	0.65	0.6		0.39
15	1	0.56	0.2		0.112
16	1	0.38	0.2		0.076
17	1	0.16	0.2		0.032
18	1				0
19	1				0
20	1				0
21	1				0

BSC Downstream Measurements

Date:	3/17/2023		Work Performed By: KH & AR		
Upstream Stage:	**1.71 ft**				
Downstream Stage:	**1.11 ft**		Discharge:		**18.0 cu ft/s**
Marker on Tape Measure (ft)	Width (ft)	Depth (ft)	Velocity (ft/sec)	Comments	Segmented discharges (cft/sec)
1	1	0.15	0.2		0.03
2	1	0.46	0.6		0.276
3	1	0.62	1.6		0.992
4	1	0.65	1.6		1.04
5	1	0.73	2.0		1.46
6	1	0.75	2.4		1.8
7	1	0.82	2.8		2.296
8	1	0.83	3.0		2.49
9	1	0.87	2.9		2.5056
10	1	0.75	2.2		1.65
11	1	0.74	1.8		1.332
12	1	0.76	1.4		1.064
13	1	0.71	0.8		0.568
14	1	0.60	0.4		0.24
15	1	0.47	0.2		0.094
16	1	0.34	0.4		0.136
17	1	0.10	0.2		0.02
18	1				0
19	1				0
20	1				0
21	1				0

BSC Downstream Measurements

Date:	3/21/2023		Work Performed By: KH & AR		
Upstream Stage:	**1.61 ft**				
Downstream Stage:	**1.06 ft**		Discharge:		**11.8 cu ft/s**
Marker on Tape Measure (ft)	Width (ft)	Depth (ft)	Velocity (ft/sec)	Comments	Segmented discharges (cft/sec)
1	1	0.35	0.2		0.07
2	1	0.46	0.2		0.092
3	1	0.63	1.2		0.756
4	1	0.65	1.6		1.04
5	1	0.61	2.0		1.22
6	1	0.70	2.6		1.82
7	1	0.68	2.8		1.904
8	1	0.72	2.0		1.44
9	1	0.66	1.8		1.188
10	1	0.63	1.6		1.008
11	1	0.69	1.0		0.69
12	1	0.62	0.6		0.372
13	1	0.58	0.2		0.116
14	1	0.41	0.2		0.082
15	1	0.23	0.2		0.046
16	1				0
17	1				0
18	1				0
19	1				0
20	1				0
21	1				0

BSC Downstream Measurements

Date:	3/22/2023		Work Performed By: KH & AR		
Upstream Stage:	**1.60 ft**				
Downstream Stage:	**1.05 ft**		Discharge:		**11.4 cu ft/s**
Marker on Tape Measure (ft)	Width (ft)	Depth (ft)	Velocity (ft/sec)	Comments	Segmented discharges (cft/sec)
1	1	0.21	0.4		0.084
2	1	0.49	1.0		0.49
3	1	0.60	1.4		0.84
4	1	0.53	1.6		0.848
5	1	0.61	2.0		1.22
6	1	0.66	2.0		1.32
7	1	0.68	2.4		1.632
8	1	0.72	2.6		1.872
9	1	0.65	1.8		1.17
10	1	0.64	1.2		0.768
11	1	0.70	0.8		0.56
12	1	0.62	0.6		0.372
13	1	0.54	0.2		0.108
14	1	0.39	0.2		0.078
15	1	0.23	0.2		0.046
16	1	0.09	0.2		0.018
17	1				0
18	1				0
19	1				0
20	1				0
21	1				0

BSC Downstream Measurements

Date:	3/31/2023		Work Performed By: KH & AR		
Upstream Stage:	**2.00 ft**				
Downstream Stage:	**1.30 ft**		Discharge:		**43.2 cu ft/s**
Marker on Tape Measure (ft)	Width (ft)	Depth (ft)	Velocity (ft/sec)	Comments	Segmented discharges (cft/sec)
1	1	0.25	1.8		0.45
2	1	0.49	2.6		1.274
3	1	0.86	3.6		3.096
4	1	1.05	3.4		3.57
5	1	1.00	3.4		3.4
6	1	1.10	3.6		3.96
7	1	0.98	3.6		3.528
8	1	1.16	3.4		3.944
9	1	1.23	3.2		3.936
10	1	1.20	3.2		3.84
11	1	1.15	3.2		3.68
12	1	1.12	3.0		3.36
13	1	1.06	2.2		2.332
14	1	0.89	1.8		1.602
15	1	0.70	1.2		0.84
16	1	0.68	0.2		0.136
17	1	0.45	0.2		0.09
18	1	0.28	0.2		0.056
19	1	0.12	0.2		0.024
20	1	0.10	0.2		0.02
21	1	0.15	0.2		0.03

BSC Downstream Measurements

Date:	4/13/2023		Work Performed By: KH & AR		
Upstream Stage:	**1.68 ft**				
Downstream Stage:	**1.07 ft**		Discharge:		**14.4 cu ft/s**
Marker on Tape Measure (ft)	Width (ft)	Depth (ft)	Velocity (ft/sec)	Comments	Segmented discharges (cft/sec)
1	1	0.09	0.2		0.018
2	1	0.35	0.2		0.07
3	1	0.51	1.6		0.816
4	1	0.58	2.2		1.276
5	1	0.62	2.2		1.364
6	1	0.55	2.8		1.54
7	1	0.63	2.8		1.764
8	1	0.70	3.2		2.24
9	1	0.68	2.4		1.632
10	1	0.61	2.0		1.22
11	1	0.70	1.6		1.12
12	1	0.70	1.2		0.84
13	1	0.54	0.6		0.324
14	1	0.53	0.2		0.106
15	1	0.36	0.2		0.072
16	1	0.14	0.2		0.028
17	1				0
18	1				0
19	1				0
20	1				0
21	1				0

Attachment C

Proposed Source Location Map

Legend

- Withdrawal Point

Scale:
1 in = 2,000 ft

0 1,000 2,000
Feet

Prepared for:
PENNENERGY RESOURCES

Map Reference:

Basemap: ESRI Basemap,
USA Topo Maps
USGS Topographic 7.5' Quadrangle:
Ambridge, PA

Projected Coordinate System:
NAD_1983_StatePlane_Pennsylvania_South
_FIPS_3702_Feet

FIGURE 1
Withdrawal Location Map
Big Sewickley Creek
Beaver County, Pittsburgh, PA

Project #: 12-115-CO

Drawn by:	Checked by:	Date:	Revision:
CJB	JWB	5/18/2021	0

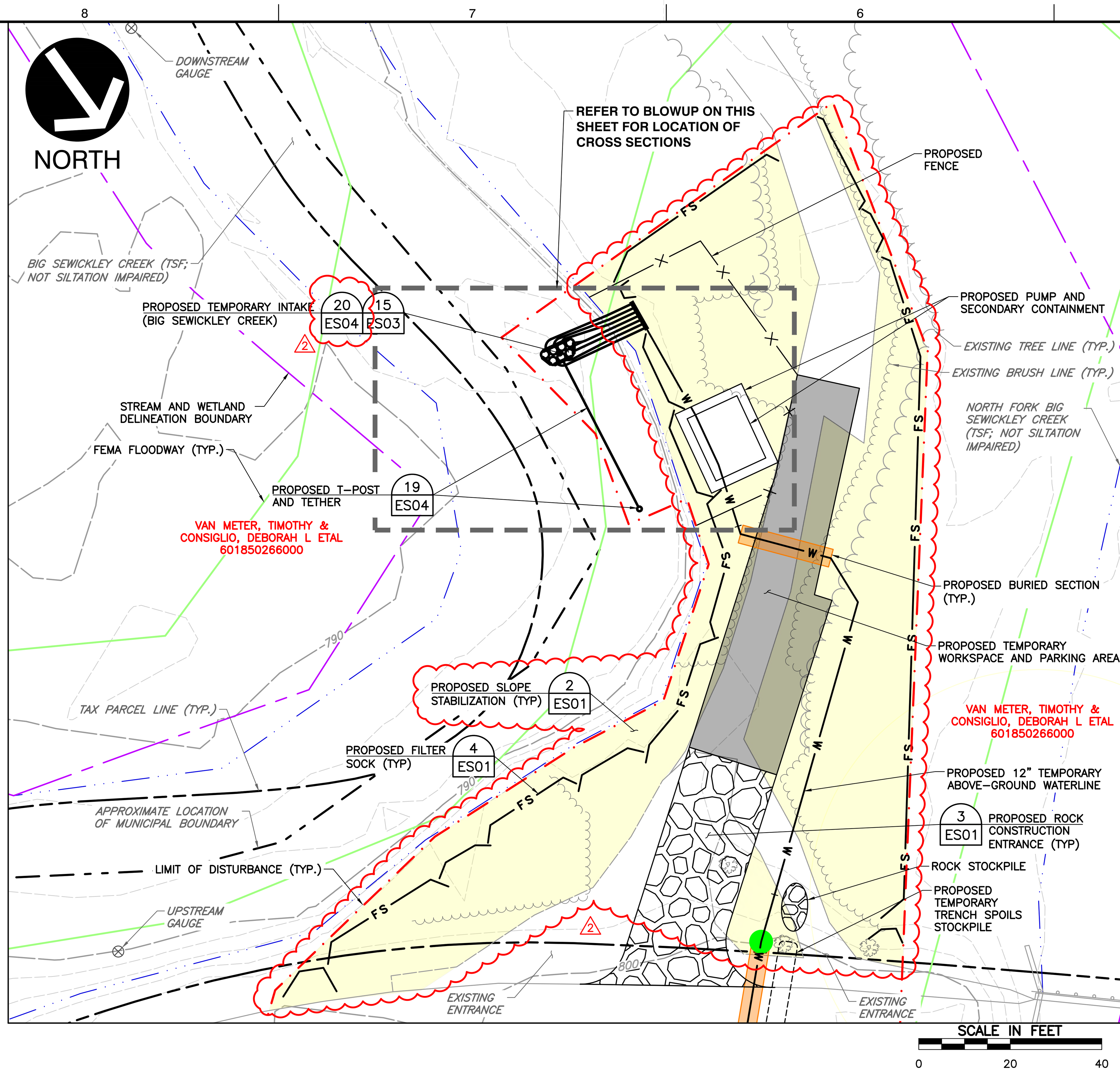
11548 Cotton Road
Suite 101
Meadville, Pa 16335
814.724.4970 voice
814.724.4973 fax
www.moody-s.com
Moody AND ASSOCIATES, INC.

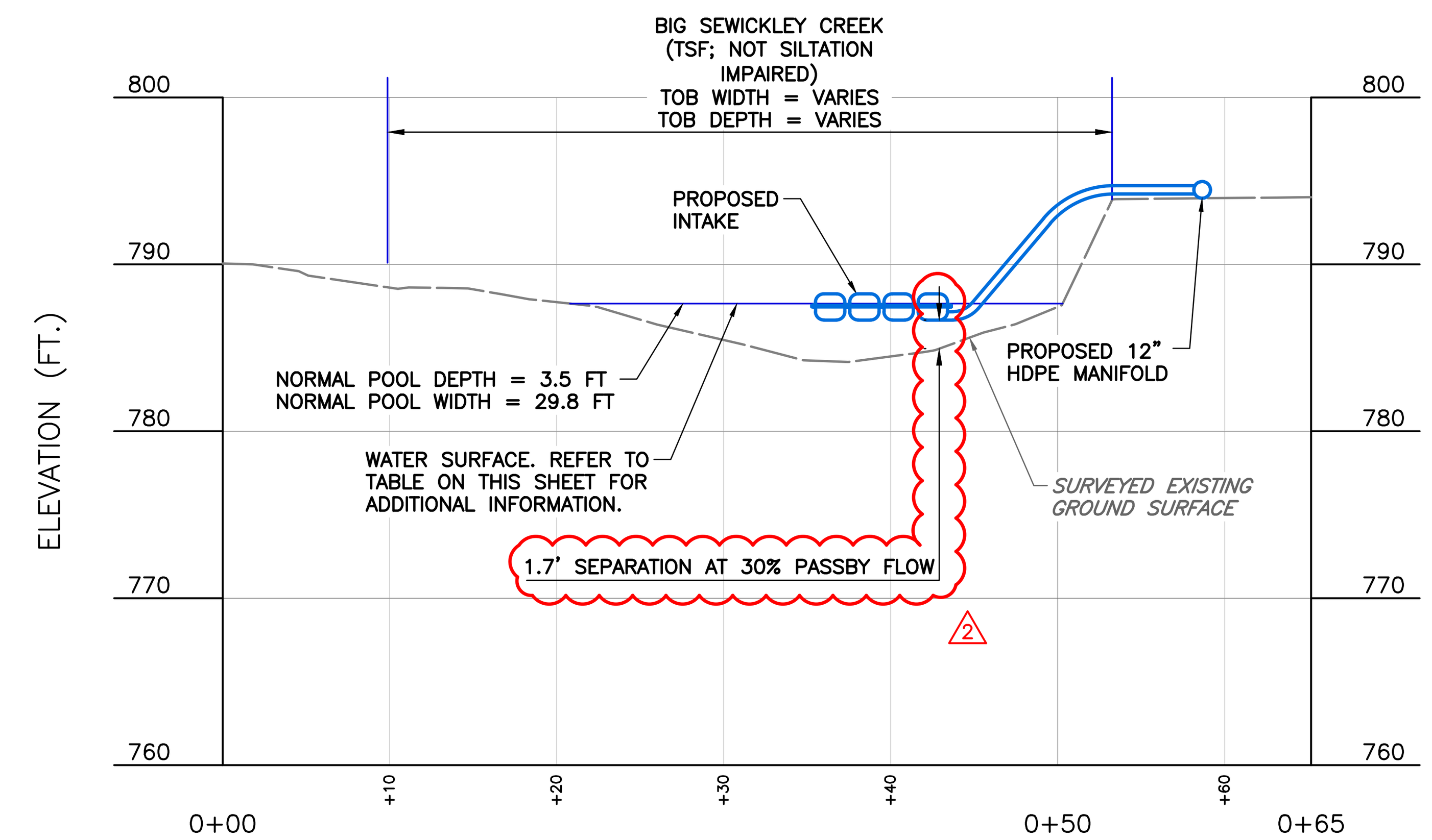
Attachment D

Operations Plan

Operations Plan:

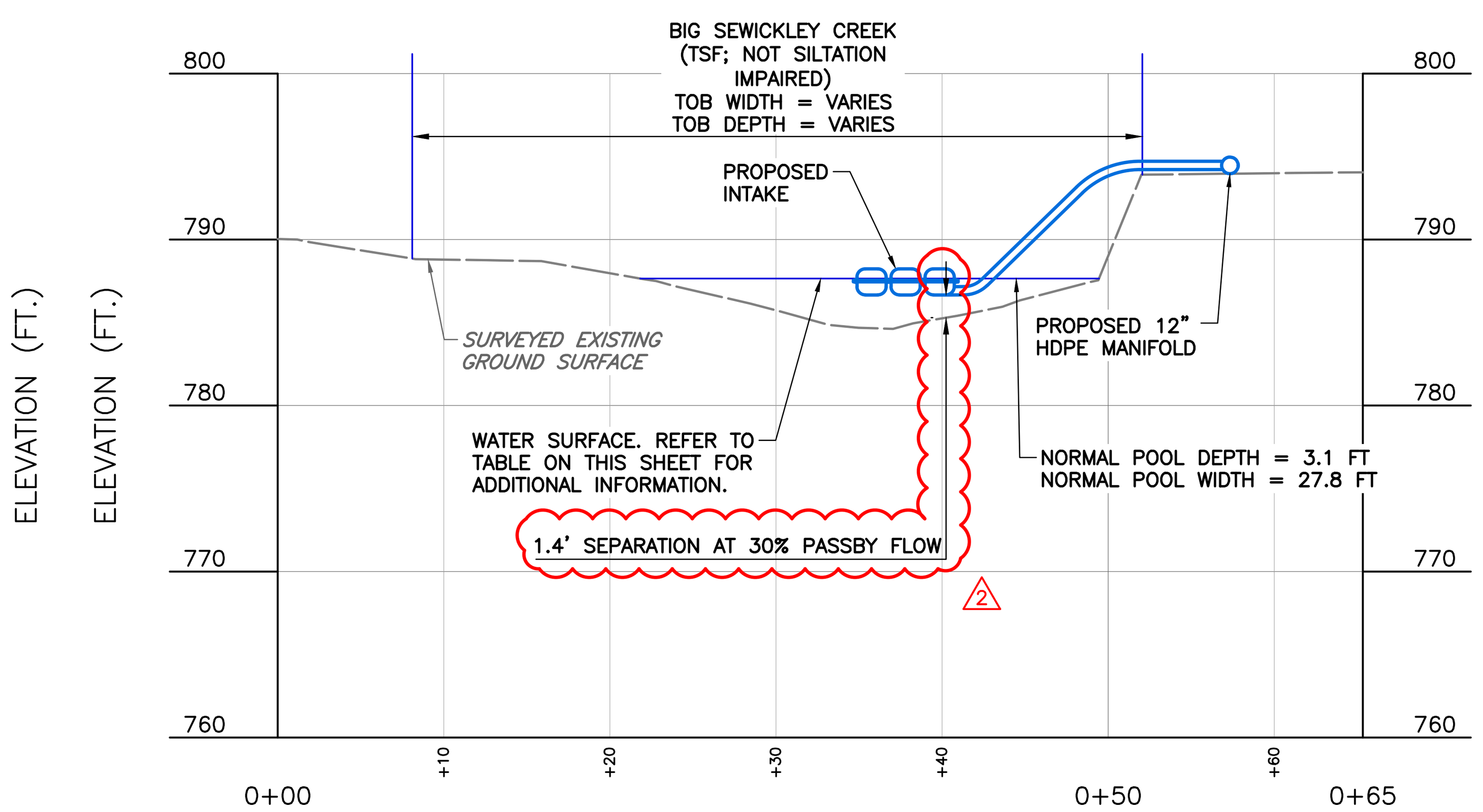
For additional details including pumps, secondary containment, water lines, additional on-site structures, protective measures, erosion and sediment control BMPs, etc., please refer to the Joint Permit Application associated with this water transfer project.





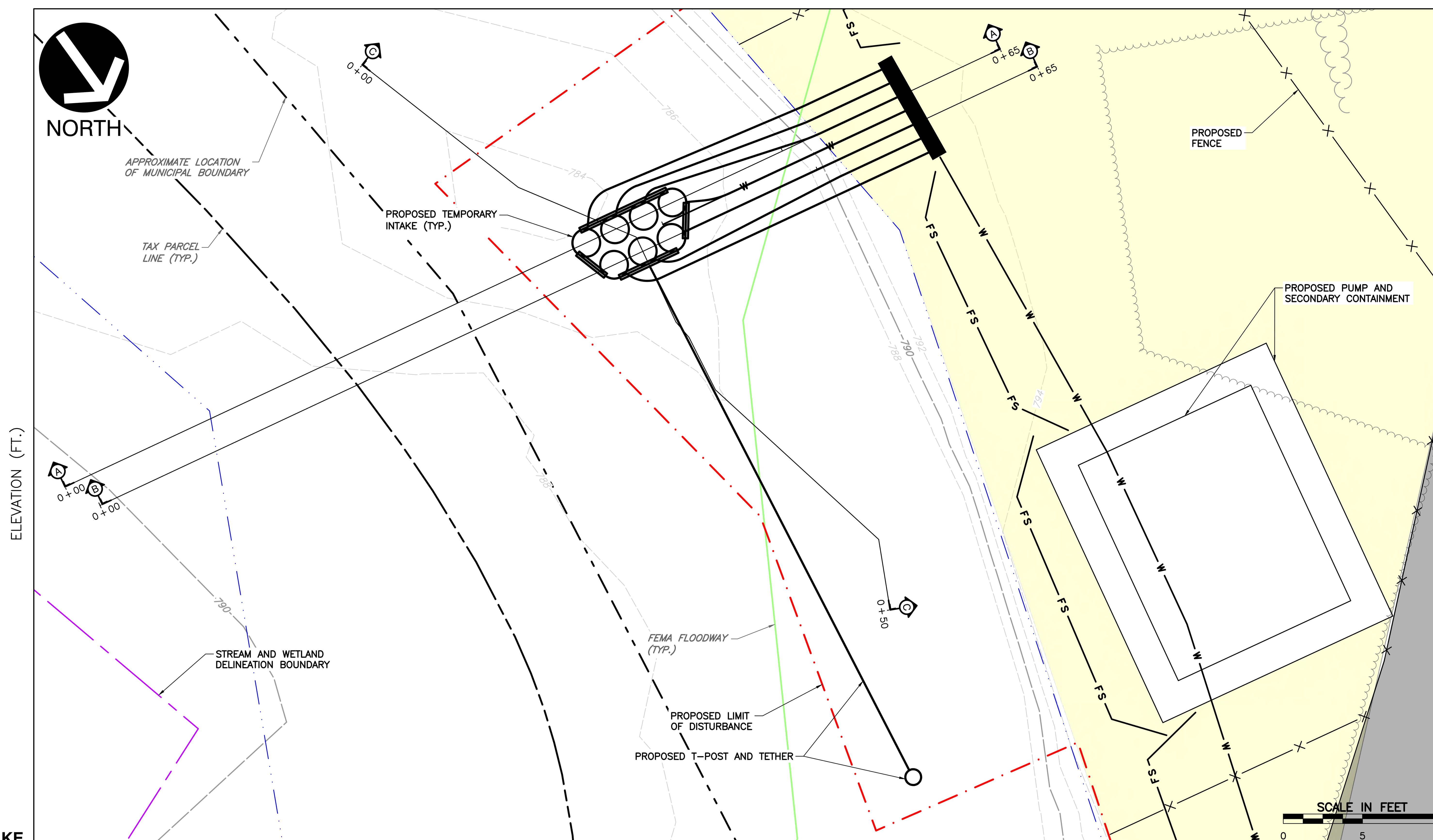
CROSS SECTION A-A

SCALE H:1"=10'; V:1"=10'



CROSS SECTION B-B

SCALE H:1"=10'; V:1"=10'



REFERENCES:

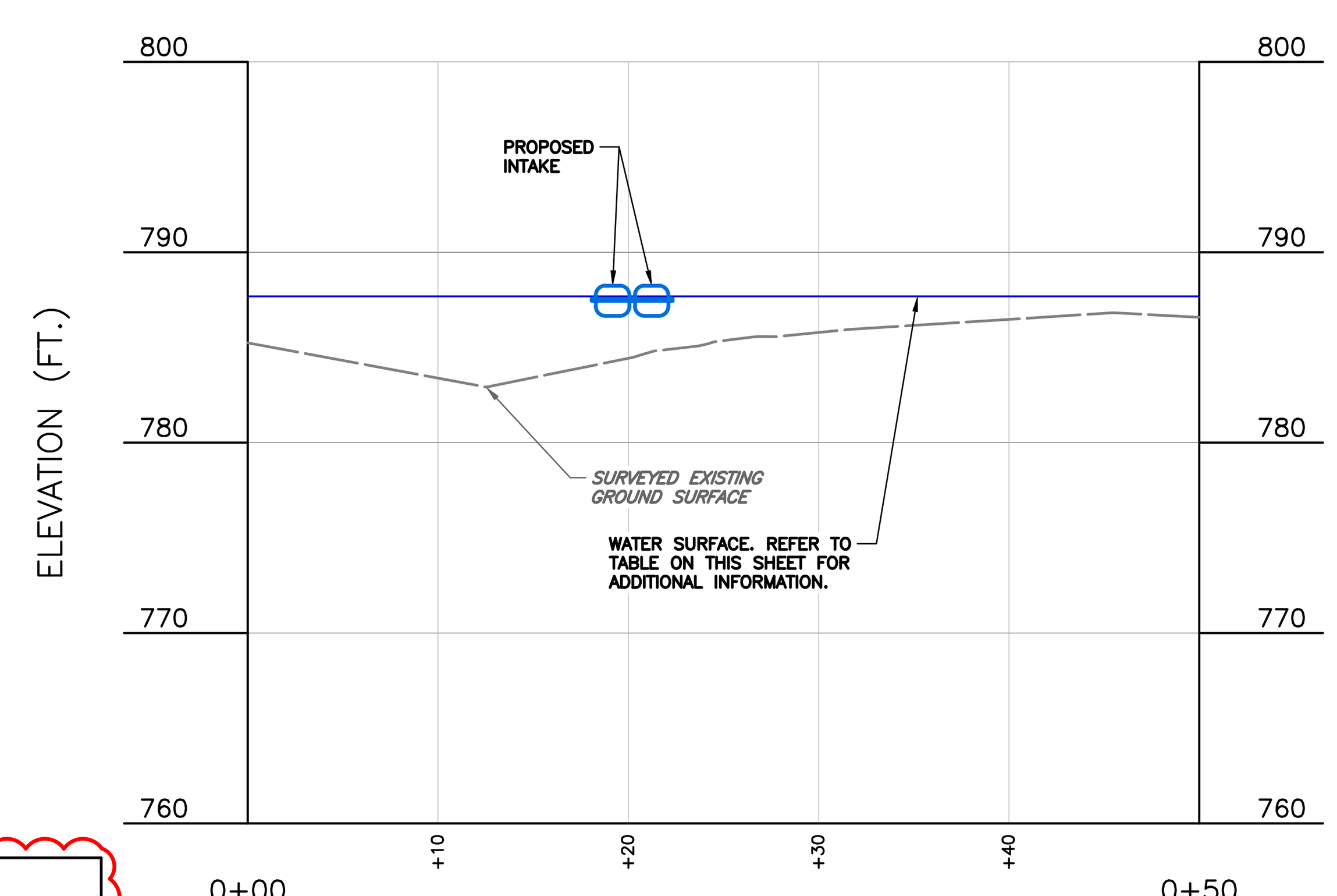
1. EXISTING TOPOGRAPHY OF BIG SEWICKLEY CREEK, IN THE VICINITY OF THE WITHDRAWAL LOCATION, OBTAINED FROM FIELD SURVEY PERFORMED BY CIVIL & ENVIRONMENTAL CONSULTANTS, INC. (CEC) IN JANUARY 2023. AS-BUILT TOPOGRAPHY FOR THE PER B50 WELL PAD SURVEYED BY CEC IN FEBRUARY 2020. EXISTING CONTOURS OUTSIDE OF THESE AREAS DERIVED FROM THE PAMAP PROGRAM 3.2 FT DIGITAL ELEVATION MODEL OF PENNSYLVANIA; DEVELOPED BY PAMAP PROGRAM, PA DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES, BUREAU OF TOPOGRAPHIC AND GEOLOGIC SURVEY; DATED MAY 2006.
2. AERIAL PHOTOGRAPHY TAKEN FROM GOOGLE EARTH PRO; IMAGERY DATED OCTOBER 8, 2020.
3. STREAM AND WETLAND DELINEATION COMPLETED BY CEC, INC. IN AUGUST 2020 AND MAY/JUNE 2021.
4. PROPERTY LINES DERIVED FROM BEAVER COUNTY TAX PARCEL DATA AND SUPPLEMENTED BY FIELD SURVEY PERFORMED BY CEC, INC. IN NOVEMBER & DECEMBER 2020 AND JUNE 2021.
5. SOURCES, INCLUDING THE PENNSYLVANIA DEPARTMENT OF TRANSPORTATION TYPE 5B MAPS FOR ECONOMY BOROUGH AND BELL ACRES BOROUGH, INDICATE THAT THE MUNICIPAL BOUNDARY FOLLOWS THE CENTERLINE OF BIG SEWICKLEY CREEK. THE MUNICIPAL BOUNDARY SHOWN ON THE PLANS WAS DIGITIZED BASED ON THE EXISTING STREAM LOCATION.

NOTE:
IF GRAVEL IS PLACED IN TEMPORARY WORKSPACES, IT MUST BE REMOVED AS SOON AS IT IS NO LONGER NEEDED OR WITHIN 12 MONTHS FOLLOWING INITIAL INSTALLATION, WHICHEVER IS LESS. THE EXISTING SOIL SHOULD BE SCARIFIED AND RELIEVED OF COMPACTION PRIOR TO SEEDING. ALL TEMPORARY WORKSPACES, WHETHER GRAVEL OF NOT, SHALL BE SEEDED, STABILIZED, AND RESTORED TO MEADOW IN GOOD CONDITION UPON COMPLETION OF THE PROJECT.

CROSS SECTION	ELEVATION			SEPARATION FROM STRAINER TO STREAM BED AT 30% PASSBY (FT)	POOL DEPTH		
	30% PASSBY (8.8 CFS)	50% PASSBY (13.1 CFS)	NORMAL POOL (21.6 CFS)		30% PASSBY (8.8 CFS)	50% PASSBY (13.1 CFS)	NORMAL POOL (21.6 CFS)
A-A	787.48	787.55	787.65	1.7	3.3	3.4	3.5
B-B				1.4	2.9	3.0	3.1

NOTES:

1. THE VERTICAL PLACEMENT OF THE STRAINERS SHOWN ON THE CROSS SECTIONS ON THIS DRAWING IS BASED ON THE 30% PASSBY FLOW ELEVATION.
2. THE SEPARATION VALUES LISTED IN THE TABLE ARE THE MINIMUM SEPARATION FOR ALL STRAINERS SHOWN ON THAT CROSS SECTION.



STREAM BED PROFILE (C-C)

SCALE H:1"=10'; V:1"=10'

DETAIL 1
PROPOSED TEMPORARY INTAKE (BIG SEWICKLEY CREEK)

LEGEND

- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- TAX PARCEL LINE
- PROPERTY LINE BASED ON FIELD EVIDENCE
- STREAM/WETLAND DELINEATION BOUNDARY
- EXISTING WETLAND
- EXISTING STREAM
- ASSUMED 50' FLOODWAY
- FEMA FLOODWAY
- EXISTING OVERHEAD WIRE/UTILITY POLE
- EXISTING FENCE
- EXISTING GAS PIPELINE/MARKER
- EXISTING TREELINE
- EXISTING SANITARY SEWER/MANHOLE
- EXISTING SIGN
- EXISTING WATERLINE
- EXISTING CHANNEL
- EXISTING RIPRAP
- EXISTING CULVERT/STORM PIPE/INLET
- PROPOSED TEMPORARY ABOVE GROUND WATERLINE
- AREA NOT TO BE DISTURBED
- PROPOSED LIMIT OF DISTURBANCE
- PROPOSED FILTER SOCK
- PROPOSED ORANGE CONSTRUCTION FENCE
- PROPOSED TIMBER MAT
- PROPOSED ROCK CONSTRUCTION ENTRANCE
- PROPOSED ROCK STOCKPILE
- PROPOSED PERMANENT WATERBAR
- PROPOSED TEMPORARY WATERBAR
- PROPOSED RIPRAP APRON
- PROPOSED SLOPE STABILIZATION

REVISION RECORD

NO	DATE	DESCRIPTION
1	02/28/2023	REVISED IN ACCORDANCE WITH THE 12/23/2022 PADEP CORRECTION NOTICE.
2	04/24/2023	REVISED PER ESCGP-3 (4/6/23), JPA (4/19/23), AND WMP (4/19/23) COMMENTS

PENNENERGY RESOURCES

Civil & Environmental Consultants, Inc.
700 Cherrington Parkway · Moon Township, PA 15108
412-429-2324 · 800-365-2324
www.cecinc.com

PENNENERGY RESOURCES, LLC
B50 TEMPORARY
ABOVE-GROUND WATERLINE
ECONOMY BOROUGH
BEAVER COUNTY, PA

COMMONWEALTH OF PENNSYLVANIA REGISTERED PROFESSIONAL ENGINEER VINCENT JOSEPH SCICCHITANO NO. PE084383
04/24/2023

STREAM AND FLOODWAY CROSSING DETAILS

DATE:	MARCH 2022	DRAWN BY:	JTD
DWG SCALE:	AS SHOWN	CHECKED BY:	VJS
PROJECT NO:			317-457
APPROVED BY:			DRAFT

DRAWING NO.: JP01

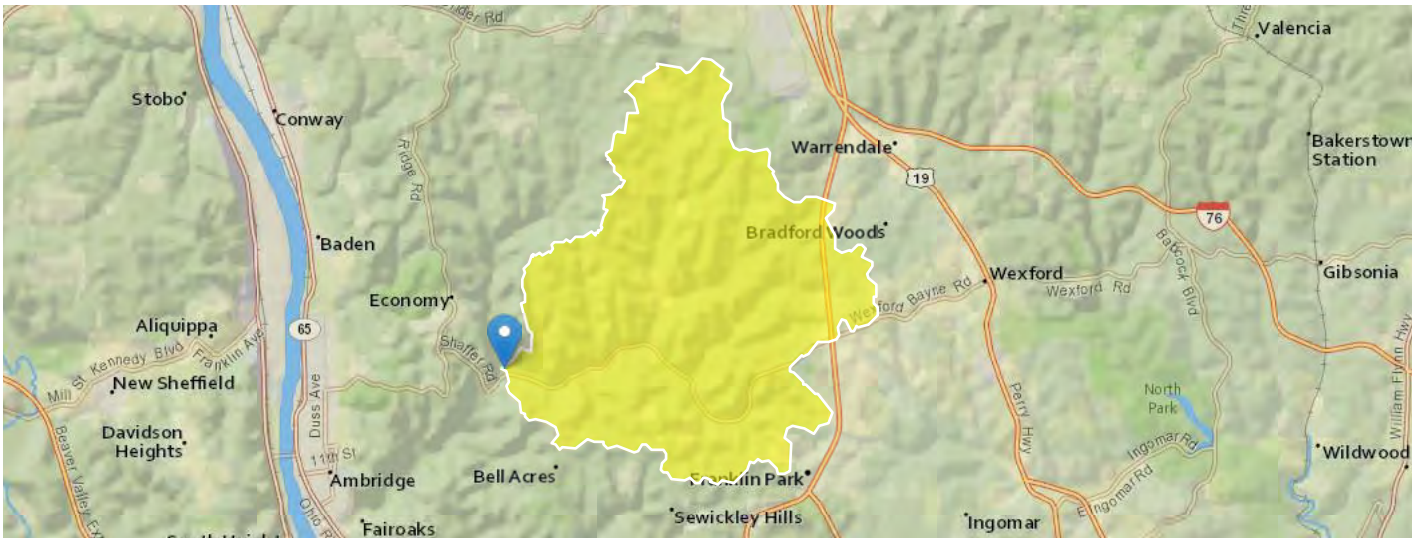
P:\310-000\317-457\-CV01\-CADD\Dwg\CV01\317457-CV01-GP FIGURES.dwg{JP01} LS:(4/28/2023 - vscicchitano) - LP: 4/28/2023 1:16 PM

Attachment E

USGS StreamStats

Big Sewickley Creek StreamStats Report

Region ID: PA
Workspace ID: PA20230125171121085000
Clicked Point (Latitude, Longitude): 40.60928, -80.18037
Time: 2023-01-25 12:11:43 -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	17	square miles
ELEV	Mean Basin Elevation	1087	feet
FOREST	Percentage of area covered by forest	74.8661	percent
PRECIP	Mean Annual Precipitation	37	inches
STORAGE	Percentage of area of storage (lakes ponds reservoirs wetlands)	0.09	percent
URBAN	Percentage of basin with urban development	15.1179	percent

Peak-Flow Statistics

Peak-Flow Statistics Parameters [Peak Flow Region 2 SIR 2019 5094]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	17	square miles	0.92	1160
STORAGE	Percent Storage	0.09	percent	0	8.9

Peak-Flow Statistics Flow Report [Peak Flow Region 2 SIR 2019 5094]

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

Statistic	Value	Unit	ASEp
50-percent AEP flood	690	ft^3/s	26.1
20-percent AEP flood	1110	ft^3/s	27
10-percent AEP flood	1440	ft^3/s	28.9

Statistic	Value	Unit	ASEp
4-percent AEP flood	1930	ft^3/s	31.6
2-percent AEP flood	2330	ft^3/s	34.8
1-percent AEP flood	2780	ft^3/s	37.8
0.5-percent AEP flood	3270	ft^3/s	41.6
0.2-percent AEP flood	4010	ft^3/s	46.1

Peak-Flow Statistics Citations

Roland, M.A., and Stuckey, M.H.,2019, Development of regression equations for the estimation of flood flows at ungaged streams in Pennsylvania: U.S. Geological Survey Scientific Investigations Report 2019–5094, 36 p. (https://doi.org/10.3133/sir20195094)

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region 4]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	17	square miles	2.26	1400
ELEV	Mean Basin Elevation	1087	feet	1050	2580

Low-Flow Statistics Flow Report [Low Flow Region 4]

PIl: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	0.652	ft^3/s	43	43
30 Day 2 Year Low Flow	1.1	ft^3/s	38	38
7 Day 10 Year Low Flow	0.256	ft^3/s	66	66
30 Day 10 Year Low Flow	0.439	ft^3/s	54	54
90 Day 10 Year Low Flow	0.765	ft^3/s	41	41

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/)

Annual Flow Statistics

Annual Flow Statistics Parameters [Statewide Mean and Base Flow]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	17	square miles	2.26	1720
ELEV	Mean Basin Elevation	1087	feet	130	2700
PRECIP	Mean Annual Precipitation	37	inches	33.1	50.4
FOREST	Percent Forest	74.8661	percent	5.1	100
URBAN	Percent Urban	15.1179	percent	0	89

Annual Flow Statistics Flow Report [Statewide Mean and Base Flow]

PIl: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	ASEp
Mean Annual Flow	21.6	ft^3/s	12	12

Annual 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/)

General Flow Statistics

General Flow Statistics Parameters [Statewide Mean and Base Flow]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	17	square miles	2.26	1720
PRECIP	Mean Annual Precipitation	37	inches	33.1	50.4
CARBON	Percent Carbonate	0	percent	0	99
FOREST	Percent Forest	74.8661	percent	5.1	100
URBAN	Percent Urban	15.1179	percent	0	89

General Flow Statistics Flow Report [Statewide Mean and Base Flow]

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

Statistic	Value	Unit	SE	ASEp
Harmonic Mean Streamflow	3.97	ft^3/s	38	38

General 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/)

Base Flow Statistics

Base Flow Statistics Parameters [Statewide Mean and Base Flow]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	17	square miles	2.26	1720
PRECIP	Mean Annual Precipitation	37	inches	33.1	50.4
CARBON	Percent Carbonate	0	percent	0	99
FOREST	Percent Forest	74.8661	percent	5.1	100
URBAN	Percent Urban	15.1179	percent	0	89

Base Flow Statistics Flow Report [Statewide Mean and Base Flow]

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

Statistic	Value	Unit	SE	ASEp
Base Flow 10 Year Recurrence Interval	7.82	ft^3/s	21	21
Base Flow 25 Year Recurrence Interval	6.93	ft^3/s	21	21
Base Flow 50 Year Recurrence Interval	6.42	ft^3/s	23	23

Base 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/)

Bankfull Statistics

Bankfull Statistics Parameters [Statewide Bankfull Noncarbonate 2018 5066]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	17	square miles	2.62	207
CARBON	Percent Carbonate	0	percent		

Bankfull Statistics Parameters [Appalachian Highlands D Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	17	square miles	0.07722	940.1535

Bankfull Statistics Parameters [Appalachian Plateaus P Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	17	square miles	0.081081	536.995602

Bankfull Statistics Parameters [USA Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	17	square miles	0.07722	59927.7393

Bankfull Statistics Flow Report [Statewide Bankfull Noncarbonate 2018 5066]

PIl: Prediction Interval-Lower, PIu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE
Bankfull Area	117	ft^2	64
Bankfull Streamflow	529	ft^3/s	74
Bankfull Width	52.5	ft	59
Bankfull Depth	2.26	ft	56

Bankfull Statistics Flow Report [Appalachian Highlands D Bieger 2015]

Statistic	Value	Unit
Bieger_D_channel_width	49.2	ft
Bieger_D_channel_depth	2.53	ft
Bieger_D_channel_cross_sectional_area	127	ft^2

Bankfull Statistics Flow Report [Appalachian Plateaus P Bieger 2015]

Statistic	Value	Unit
Bieger_P_channel_width	53.1	ft
Bieger_P_channel_depth	2.56	ft
Bieger_P_channel_cross_sectional_area	135	ft^2

Bankfull Statistics Flow Report [USA Bieger 2015]

Statistic	Value	Unit
Bieger_USA_channel_width	33.6	ft
Bieger_USA_channel_depth	2.2	ft
Bieger_USA_channel_cross_sectional_area	78.9	ft^2

Bankfull Statistics Flow Report [Area-Averaged]

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

Statistic	Value	Unit	SE
Bankfull Area	117	ft^2	64
Bankfull Streamflow	529	ft^3/s	74
Bankfull Width	52.5	ft	59
Bankfull Depth	2.26	ft	56
Bieger_D_channel_width	49.2	ft	
Bieger_D_channel_depth	2.53	ft	
Bieger_D_channel_cross_sectional_area	127	ft^2	
Bieger_P_channel_width	53.1	ft	
Bieger_P_channel_depth	2.56	ft	
Bieger_P_channel_cross_sectional_area	135	ft^2	
Bieger_USA_channel_width	33.6	ft	
Bieger_USA_channel_depth	2.2	ft	
Bieger_USA_channel_cross_sectional_area	78.9	ft^2	

Bankfull Statistics Citations

Clune, J.W., Chaplin, J.J., and White, K.E.,2018, Comparison of regression relations of bankfull discharge and channel geometry for the glaciated and nonglaciated settings of Pennsylvania and southern New York: U.S. Geological Survey Scientific Investigations Report 2018–5066, 20 p. (https://doi.org/10.3133/sir20185066)

Bieger, Katrin; Rathjens, Hendrik; Allen, Peter M.; and Arnold, Jeffrey G.,2015, Development and Evaluation of Bankfull Hydraulic Geometry Relationships for the Physiographic Regions of the United States, Publications from USDA-ARS / UNL Faculty, 17p. (https://digitalcommons.unl.edu/usdaarsfacpub/1515?utm_source=digitalcommons.unl.edu%2Fusdaarsfacpub%2F1515&utm_medium=PDF&utm_campaign=PDFCoverPages)

Application Version: 4.12.0
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

Attachment F

Passby Flow Determination

Passby Determination

In accordance with guidance provided by the Pennsylvania Fish and Boat Commission (PAFBC) in their Species Impact Review (SIR) #56633 (attached) the Tennant method, also known as the Montana method, is proposed to determine the appropriate protective flow regimens during withdrawals. A copy of a report describing the method by Donald Tennant, detailing its nearly universal applicability, is attached. The method describes separate minimum flow regimens for October through March, and April through September. It states that 10% of average flow is the minimum required for short-term fish survival, whereas 30% and 50% of average flow during the previously mentioned monthly spans, respectively, is considered an "excellent" instream flow regimen for fish, wildlife, recreation, and related environmental resources.

Based on the ADF of 21.6 cubic feet per second (cfs) provided by the United States Geologic Survey StreamStats online application and the flow regimen recommendations applied from the Tennant method, the following passby flows are proposed, along with the volume required for the full requested withdrawal of 1.5 million gallons per day:

Table: Recommended base flow regimen based on Tennant's "Excellent" flow description and Average Daily Flow from USGS StreamStats

			30% ADF (Oct-Mar)		50% ADF (Apr-Sept)	
	BSC Average Daily Flow	Proposed Withdrawal Amount (% of ADF)	Minimum Passby – Stop Withdrawal	Passby Required for Full Withdrawal	Minimum Passby – Stop Withdrawal	Passby Required for Full Withdrawal
Cubic Feet per Second	21.6	2.3 (10.6%)	6.5	8.8	10.8	13.1
Gallons per Day	13,960,408	1,500,000 (10.6%)	4,188,123	5,687,574	6,980,204	8,479,655
Stage Measured at Onsite Staff Gage (Upstream /Downstream) (ft)	1.71/1.19		1.34/0.96	1.43/1.02	1.49/1.05	1.55/1.09

The less restrictive of the two passby percentages (30%) is adequately protective of both instream flows and low flows. Tennant lists 30% ADF as representative of "excellent" flow conditions and states "This is a base flow recommended to sustain good survival habitat for most aquatic life forms.". During the late May through early June spawning season of the Southern Redbelly Dace, an enhanced passby of 50% ADF is proposed to offer additional habitat protection for the species. The PAFBC has concurred with this assessment of flow protection and stated in SIR #56633 that "This pass by flow recommendation is

deemed to be protective of instream habitat minimizing decreases in wetted width.”.

pennsylvania
FISH AND BOAT COMMISSION

August 5, 2022

IN REPLY REFER TO
SIR# 56633

Moody & Associates, Inc.
Jordan Bell
11548 Cotton Road
Meadville, Pennsylvania 16335

RE: Species Impact Review (SIR) – Rare, Candidate, Threatened and Endangered Species
PNDI Search No. 734429
Big Sewickley Creek Withdrawal
Economy Borough: BEAVER County

Dear Jordan Bell:

This responds to your inquiry about a Pennsylvania Natural Diversity Inventory (PNDI) Internet Database search "potential conflict" or a threatened and endangered species impact review. These projects are screened for potential conflicts with rare, candidate, threatened or endangered species under Pennsylvania Fish and Boat Commission jurisdiction (fish, reptiles, amphibians, aquatic invertebrates only) using the Pennsylvania Natural Diversity Inventory (PNDI) database and our own files. These species of special concern are listed under the Endangered Species Act of 1973, the Wild Resource Conservation Act, and the Pennsylvania Fish and Boat Code (Chapter 75), or the Wildlife Code.

Southern Redbelly Dace (*Chrosomus erythrogaster*, PA Threatened)

PennEnergy Resources has requested to withdrawal 1.5 million gallons of water per day from Big Sewickley Creek for development of the B50 well-pad. Ongoing coordination with this office has led to reductions in the proposed daily withdrawal volume from Big Sewickley Creek and the abandonment of plans to withdrawal water from North Fork Big Sewickley Creek. Through coordination, we have requested that multiple methods be employed to estimate water level changes in Big Sewickley Creek resulting from the proposed withdrawal. This level of analysis was requested to evaluate potential impacts to the Southern Redbelly Dace and its habitat.

To date, four iterations of the Big Sewickley Creek water management plan (WMP) have been submitted for review. At our recommendation, you submitted an amended plan on March 10, 2022 following pass-by flow recommendations outlined in the Susquehanna River Basin Commission's *Low Flow Protection Policy* (Policy # 2003-01) utilizing stream discharge information derived from the United State Geological Service's (USGS) online StreamStats application. Due to ongoing concerns for potential impacts to instream habitat for the Southern Redbelly Dace, we requested that a similar analysis be performed employing the Tennant Method based on instream flow statistics calculated from decommissioned USGS gauge # 03086110. An additional WMP amendment describing the potential impact of the project utilizing these recommendations was submitted on July 15, 2022.

We have reviewed both the submitted plans and request that the recommendations outlined using the Tennant Method be applied to instream flow estimates provided by the USGS StreamStats online application for Big Sewickley Creek. The Tennant method recommends a pass by flow of 30% of the average daily flow (ADF) for the months of October through March and 50% of the ADF from April to September. This pass by flow recommendation is deemed to be protective of instream habitat minimizing decreases in wetted width. Please amend the WMP using the recommendation described above for our review and concurrence.

If approved, we request that a report detailing daily withdrawals be provided to this office on a monthly basis via email (draab@pa.gov). Additionally, we request that installation of pumps be coordinated with this office.

This response supersedes our letter of August 23, 2021 for PNDI # 734429 & 734425 and represents the most up-to-date summary of the PNDI data and our files and is valid for two (2) years from the date of this letter. An absence of recorded species information does not necessarily imply species absence. Our data files and the PNDI system are continuously being updated with species occurrence information. Should project plans change or additional information on listed or proposed species become available, this determination may be reconsidered, and consultation shall be re-initiated.

If you have any questions regarding this review, please contact Dakota Raab at 814-359-5117 or draab@pa.gov and refer to the SIR # 56633. Thank you for your cooperation and attention to this important matter of species conservation and habitat protection.

Sincerely,

Dakota Raab, Fisheries Biologist
Resource Extraction Section

/DR/dn

INSTREAM FLOW REGIMENS FOR FISH, WILDLIFE, RECREATION AND RELATED ENVIRONMENTAL RESOURCES

Donald Leroy Tennant

ABSTRACT

A quick, easy methodology is described for determining flows to protect the aquatic resources in both warmwater and coldwater streams, based on their average flow. Biologists do their analysis with aid of hydrological data provided by the U.S. Geological Survey (USGS). Detailed field studies were conducted on 11 streams in 3 states between 1964 and 1974, testing the "Montana Method." This work involved physical, chemical, and biological analyses of 38 different flows at 58 cross-sections on 196 stream-miles, affecting both coldwater and warmwater fisheries. The studies, all planned, conducted, and analyzed with the help of state fisheries biologists, reveal that the condition of the aquatic habitat is remarkably similar on most of the streams carrying the same portion of the average flow. Similar analyses of hundreds of additional flow regimens near USGS gages in 21 different states during the past 17 years substantiated this correlation on a wide variety of streams. Ten percent of the average flow is a minimum instantaneous flow recommended to sustain short-term survival habitat for most aquatic life forms.Thirty percent is recommended as a base flow to sustain good survival conditions for most aquatic life forms and general recreation. Sixty percent provides excellent to outstanding habitat for most aquatic life forms during their primary periods of growth and for the majority of recreational uses.

Introduction

Natural, free-flowing streams are one of the world's most beautiful and valuable resources. Before the coming of Christ, the Roman Emperor Justinian said: "By the law of nature certain things are common property; for example, the air, running water, and the sea." America's late Senator Norris from Nebraska said: "The streams that are flowing downhill were given us by a creator. They do not belong to any special interest or to any individual. They belong to the people and ought to be utilized for the benefit of all of them."

Few streams in the United States have escaped degradation from land use practices or altered flows by some kind of man-made "water development" project. Some recognition is finally being given to instream flow regimens to protect the natural environment. Scientists from many disciplines are seeking reliable, practical methods for derermining streamflow requirements to protect fishes, waterfowl, furbearers, reptiles, amphibians, molluscs, other aquatic invertebrates, and related life forms from all the various people competing for our Nation's water.

With the help of several hydrologists and many State and Federal biologists, this quick, easy method was developed for determining flows to protect the aquatic resources in both warmwater and coldwater streams. This methodology evolved over the past 17 years from work on hundreds of streams in the states north of the Mason-Dixon Line between the Atlantic Ocean and the Rocky Mountains. This work has been cited in a score of publications and is best known as the "Montana Method."

THE AUTHOR: A native of Ohio, Donald L. Tennant graduated from Ohio State University with a B.S. in Fish and Wildlife Conservation and worked for the Ohio Division of Wildlife. For nineteen years he has been with the U.S. Fish and Wildlife Service.

Method

The Montana Method is so brief it can be typed on a 3" x 5" card. It can be applied rapidly to many segments of thousands of streams by referring to Table 1 of this paper and surface water records of the USGS.

Table 1. Instream flow regimens for fish, wildlife, recreation, and related environmental resources.

Narrative description of flows [a]	Recommended base flow regimens Oct.-Mar.	Apr.-Sept.
Flushing or maximum	200% of the average flow	
Optimum range	60%-100% of the average flow	
Outstanding	40%	60%
Excellent	30%	50%
Good	20%	40%
Fair or degrading	10%	30%
Poor or minimum	10%	10%
Severe degradation	10% of average flow to zero flow	

[a] Most appropriate description of the general condition of the stream flow for all parameters listed in the title of this paper.

The following intensive use of this method will produce a factual, conclusive streamflow study on any stream. First, determine the average annual flow of the stream at the location(s) of interest (listed as AVERAGE DISCHARGE by USGS and hereinafter called *average flow*). If the average flow is not published by the USGS, it can quickly be calculated for you. Visit the stream and observe, photograph, sample, and study flow regimens approximating 10%, 30%, and 60% of the average flow. Other flows can be studied, but these three regimens will cover a flow range from about the minimum to near the maximum that can normally be justified and recommended to protect the natural environment on most streams.

The average flow of a stream (or any given portion or per-

cent of the average flow) is a composite manifestation of the size of the drainage area, geomorphology, climate, vegetation, and land use. These relationships have been evaluated and reported also by other biologists and hydrologists. (Rantz 1964; Tennant 1957-1975).

On uncontrolled streams, study USGS records for daily, monthly, and annual flow patterns; then go to the field and check their gages until you can view and study natural flows approzimating 10%, 30%, and 60% of the average flow.

If flows are controlled, begin by having the highest flow you wish to study released first; then regulate so that each succeeding lower flow will begin the following midnight. Photos taken early the next morning will reveal the difference in exposed substrate or wetted perimeter (Fig. 1). This is photographic "regression analysis." An interval of 8-10 hours will normally be sufficient to negate any appreciable differences in flow levels due to bank storage.

Figure 1. Missouri River below Holter Dam, Montana, showing differences between flows of 3,000 cfs (55% of the average flow) and 2,000 cfs (37% of the average flow). The vertical drop was 7 inches. Flows reduced about midnight will clearly reveal differences in wetted substrate when photographed the next morning (photographic "regression analysis").

Pictures may be the best data you will collect for selling your recommendations to the general public, administrators of construction agencies managing water development projects, and judges or juries adjudicating water laws. Black and white photographs and 35 mm slides of key habitat types (e.g., riffles, runs, pools, islands and bars) from elevated vantage points like bridges and high stream banks will give results superior to ground level shots or photos from aircraft high above the stream. Record appropriate, vital information on all photographs and slides as soon as they are received.

USGS monthly measurements of width, depth, and velocity cover a variety of flows at most of their stream gage or cable crossings. Obtain cross-sectional data on width, depth, and velocity measurements from the local USGS field office for flow regimens under study. Use this information to plot and compare water widths, depths, and velocities to known requirements for aquatic resources. As manpower and money permit, USGS will make specific cross-sectional measurements of width, depth, and velocity for government agencies at any point on any stream. It requires proper experience, equipment, and plenty of time for others to make the necessary cross-sectional measurements. Study average daily, monthly, and annual stream-flow regimen tables and previous historic low-flow data published by USGS to learn the base flow patterns of the climatic year and help determine flows that mimic nature and justify your final recommendations. Recommend the most appropriate and reasonable flow(s) that can be justified to provide protection and habitat for all aquatic resources.

Results

Detailed field studies were conducted on 11 streams in 3 states between 1964 and 1974 testing the Montana Method (Table 2). This work involved physical, chemical, and biological analyses of 38 different flows at 50 cross-sections on 196 stream miles, affecting both coldwater and warmwater fisheries. Reports or publications on 6 study streams are available as indicated in

Table 2. Detailed studies of instream flow regimens using the Montana Method.

Name of Stream	State	Date	Miles Studied	Number of Stations	Different Flows	Parameters Studied[a]	Type of Fishery[b]	Reference
Republican R.	Nebraska	1964	40	3	4	W,D,V,S,B,C,T,F	WW	25
Wind-Bighorn R.	Wyoming	1968	50	10	3	W,D,S,B,C,T,F	CW & WW	24
Marias R.	Montana	1968	67	9	3	W,D,V,S,B,C,T,F	CW & WW	
Missouri R.	Montana	1970	15	8	4	W.D.V.S.B,C,I,F	CW & WW	
Blacks Fork R.	Wyoming	1971	16	4	3	W,D,V,S,C,I	CW	31
Shoshone Creek	Wyoming	1971	1	2	9	W,D,V,S,B,C,F	CW	
Ruby R.	Montana	1971	1	4	3	W,D,V,S,B,C,F	CW	10
W. Fk. Bitterroot	Montana	1971	1	5	3	W,D,V,S,B,C,F	CW	10
W. Rosebud R.	Montana	1971	3	3	4	W,D,V,S,B,C,F	CW	10
N. Platte R.	Wyoming	1974	2	10	2	W,D,V,S,B,C,F	CW & WW	
Totals				196	58	38		

[a]Parameters Studied: W, Width; D, Depth; V, Velocity; S, Substrate & Sidechannels; B, Bars & Islands; C, Cover; M, Migration; T, Temperature; I, Invertebrates; F, Fishing & Floating; E, Esthetics & Natural Beauty.
[b]Type Fishery: WW, Warmwater; CW, Coldwater.

(INSTREAM FLOW—)

Table 2. Numerous black and white photos and 35 mm slides were taken of all the flow stages studied at each cross-section. The studies, all planned, conducted, and analyzed with the help of state fisheries biologists, reveal that the condition of the aquatic habitat is remarkably similar on most streams carrying the same portion of the average flow.

Width, depth, and velocity are physical instream flow parameters vital to the well-being of aquatic organisms and their habitat. Sixteen hundred measurements of these parameters for 48 different flows on 10 of the streams cited in Table 2 show that they all increase with flow, and that changes are much greater at the lower levels of flow (Fig. 2). Width, depth, and velocity all changed more rapidly from no flow to a flow of 10% of the average than in any range thereafter.

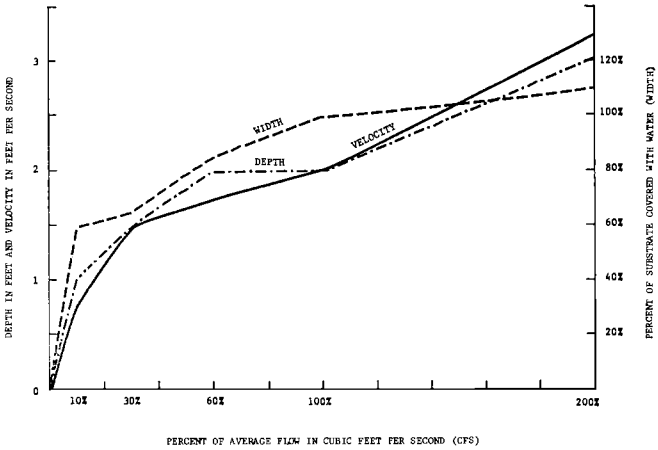


Figure 2. Average width, depth, and velocity from ten field tests of instream flow regimens using the Montana Method and the USGS hydrology data.

Ten percent of the average flow covered 60% of the substrates. depths averaged 1 foot, and velocities averaged 0.75 foot per second. Studies show that these are critical points or the lower limits for the well-being of many aquatic organisms, particularly fishes. This substantiates the conclusion that this is the area of most severe degradation or that 10% is a minimum short-term survival flow at best. Flows from 30% to 100% of average result in a gain of 40% for wetted substrate, average depth increases from 1.5 to 2 feet, and average velocities rise from 1.5 to 2 feet per second. These are within good to optimum ranges for aquatic organisms; however, it requires 3 to 10 times the amount of water needed for a short-term minimum or good base flow, and gains or benefit/cost ratios may become questionable. Increasing flow frim 100% of average to 200% of average (doubled) only increases average wetted substrate by 10%, average depth increases from 2 to 3 feet, and average velocity rises from 2 to 3.5 feet per second. Velocities averaging 3.5 feet per second are probably too high for the general well-being of most aquatic organisms but good for moving sidiment, bedload, and white water boating, In all 11 field tests of the Montana Method, water depth appeared adequate for aquatic organisms whenever velocities were satisfactory.

Analyses of hundreds of additional flow regimens near USGS gages in 21 different states during the past 17 years substantiate these correlations between similar flows on a wide variety of streams. Running waters studied ranged from small precipitous brooks high in the Rocky Mountains, to large, low-gradient rivers out on the prairies of mid-America and streams along the coastal plains. This phenomenon of nature is dicumented with hundreds of black and white photographs and 35 mm slides that are registered and filed with the U.S. Fish and Wildlife Service (FWS) in Billings, Montana; Grand Island, Nebraska; and Denver, Colorado.

Application of the Montana Method

Using the Montana Method it is easy to adjust to above or below water years and maintain stream flows that are appropriate portions of monthly, quarterly, or annual instream supplies of water. This helps fish, wildlife, and aquatic resources share surpluses and shortages of water equitably with other users.

With the Montana Method, USGS measures the hydraulic characteristics of the stream, and biologists interpret the biological responses. This saves considerable precious time that biologists can use on a more complete ecological analysis of streamflow needs.

There is significant hydrological and biological evidence that the Montana Method can be used successfully on streams throughout the United States and in other parts of the world (Rantz 1964; Whelan and Wood 1962). USGS data from cross-sectional measurements is subject to computer analysis with predicted flow parameters for width, depth, velocity, hydraulic radius, etc. at any desired water stage between zero and historic peak discharge.

USGS is considering the revision of stream flow data programs for most of the states (U.S. Department of Interior). The majority of existing gages may be discontinued under its future program. Techniques like measuring channel geometry, interpolation from a known flow to an unknown flow, and correlations with adjacent streams will be used to provide stream flow information at any point on any stream. Simple channel geometry measurements have produced average flow data as accurate as 10 years of continuous gage records (Hedman and Kastner 1974). The standard errors were lowest for mountain regions and in competition with 5 to 10 years of gaged records for the plains region. There is very little variation when results are compared between channel width and average flow (Fig. 3).

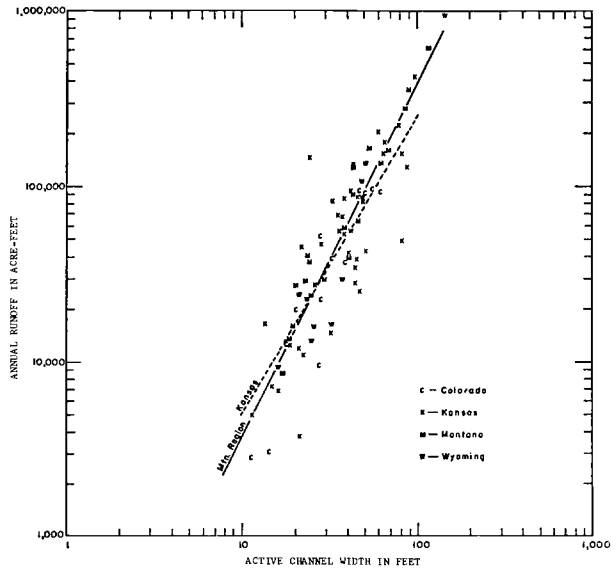


Figure 3. Correlation between average flow and channel width for streams in the mountain and plains regions of Colorado, Kansas, Montana, and Wyoming. Used with the permission of E.R. Hedman.

Mean annual discharge is one of the few criteria that will be routinely provided by this future program. Therefore, the Montana Method can still be used with this new program, since it is based primarily on knowledge of the mean annual discharge or average flow. The ability to provide the average flow at any point on any stream at any time would actually facilitate the use of the Montana Method in the future.

Adopting the metric system would not require conversion tables or other problems since this method is based on percentages of the average flow however it is expressed.

Conclusions

Ten percent of the average flow: This is a minimum instantaneous flow recommended to sustain short-term survival habitat for most aquatic life forms. Channel widths, depths, and velocities will all be significantly reduced and the aquatic habitat degraded (Figs. 2,4). The stream substrate or wetted perimeter will be about half exposed, except in wide, shallow riffle or shoal areas where exposure could be higher. Side channels will be severely or totally dewatered. Gravel bars will be substantially dewatered, and islands will usually no longer function as wildlife nesting, denning, nursery, and refuge habitat. Streambank cover for fish and fur animal denning habitat will be severely diminished. Many wetted areas will be so shallow they no longer will

Figure 4. Republican River below Hardy Bridge, Nebraska, showing a flow of 12 cfs (10% of the average flow). Water depths were adequate to provide some fish cover, living space, movement, and fishing. Temperatures were within tolerable limits. This is a *minimum* instantaneous flow recommended to sustain short-term survival habitat for most aquatic life forms.

serve as cover, and fish will be crowded into the deepest pools. Riparian vegetation may suffer from lack of water. Large fish will have difficulty migrating upstream over riffle areas. Water temperature often becomes a limiting factor, especially in the lower reaches of streams in July and August. Invertebrate life will be severly reduced. Fishing will often be bery good in the deeper pools and runs since fish will be concentrated. Many fishermen prefer this level of flow. However, fish may be vulnerable to overharvest. Floating is difficult even in a canoe or rubber raft. Natural beauty and stream esthetics are badly degraded. Most streams carry less than 10% of the average flow at times, so even this low level of flow will occasionally provide some enhancement over a natural flow regimen.

Thirty percent of the average flow: This is a base flow recommended to sustain good survival habitat for most aquatic life forms. Widths, depths, and velocities will generally be satisfactory (Figs. 2,5). The majority of the substrate will be covered with water, except for very wide, shallow riffle or shoal

Figure 5. Bighorn River below Boysen Dam, Wyoming, showing a flow of 400 cfs (30% of the average flow). Water depth was adequate for trout movement, spawning, incubation, and winter survival in most run and pool areas for a distance of 45 car miles downstream. This is a base flow recommended to sustain *good* survival habitat for most aquatic life forms.

areas. Most side channels will carry some water. Gravel bars will be partially covered with water and many islands will provide wildlife nesting, denning, nursery, and refuge habitat. Streambanks will provide cover for fish and wildlife denning habitat in many reaches. Many runs and most pools will be deep enough to serve as cover for fishes. Riparian vegetation will not suffer from lack of water. Large fish can move over riffle areas. Water temperatures are not expected to become limiting in most stream segments. Invertebrate life is reduced but not expected to become a limiting factor in fish production. Water quality and quantity should be good for fishing, floating, and general recreation, especially with canoes, rubber rafts, and smaller shallow draft boats. Stream esthetics and natural beauty will generally be satisfactory.

Sixty percent of the average flow: This is a base flow recommended to provide excellent to outstanding habitat for most aquatic life forms during their primary periods of growth and for the majority of recreational uses. Channel widths, depths, and velocities will provide excellent aquatic habitat (Figs. 2,6). Most of the normal channel substrate will be covered with water, including many shallow riffle and shoal areas. Side channels that normally carry water will have adequate flows. Few gravel bars will be exposed, and the majority of islands will serve as wildlife nesting, denning, nursery, and refuge habitat. The majority of streambanks will provide cover for fish and safe denning areas for wildlife. Pools, runs, and riffles will be ade-

Donald L. Tennant

Figure 6. North Fork Shoshone River near Wapiti, Wyoming, showing a flow of 456 cfs (approximately 60% of the average flow). Water widths, depths, and velocities very good for fish and fishing in all riffles, runs and pools. This is a base flow recommended to provide *excellent* to *outstanding* habitat for most aquatic life forms during their primary periods of growth and for the majority of recreational uses.

quately covered with water and provide excellent feeding and nursery habitat for fishes. Riparian vegetation will have plenty of water. Fish migration is no problem in any riffle areas. Water temperatures are not expected to become limiting in any reach of the stream. Invertebrate life forms should be varied and abundant. Water quality and quantity is excellent for fishing and floating canoes, rafts, and larger boats, and for general recreation. Stream esthetics and natural beauty will be excellent to outstanding.

A flow of two to three times the average flow is often best for kayaks and whitewater canoeing. A flow of this magnitude is also preferable for larger boats with inboard or outboard motors, like those many people use on the annual Missouri and Yellowstone River floats held in June and July in Montana.

Recommendations

1. Request "instantaneous flows" to prevent flow releases from dams and diversion structures that are averaged over a day, month, or year, which permits erratic releases or even no flow at times.
2. Recommend that dual or multiple outlets to all dams be designed and constructed so that minimum flows of an appropriate temperature and quality to protect the aquatic environment can be by-passed at all times, including during drawdowns for safety inspections and emergency repairs.
3. Insist that costs for providing of instream flows to protect the aquatic environment downstream below dams be project costs, including costs for unforeseen emergency repairs and routine maintenance over the life of the project.
4. Justify only that portion of a stream flow required to fulfill specific instream needs. If fish need a flow of 100 cfs in a segment of stream where there are already legal requirements of 25 cfs for municipal water, 15 cfs for irrigation water transport, and 10 cfs for a U.S. Environmental Protection Agency water quality requirement, you logically and legally should have to justify a flow of only 50 cfs. Planners of water development projects may ask you to justify and apply benefit/cost ratios for fish to the 100 cfs flow because this makes their "project purpose" look more favorable on a comparable benefit/cost basis.
5. Stipulate that the downstream flow will not be less than the inflow to impoundments, whenever operators of water development projects cannot provide specific flow requirements. Make this an integral part of every flow regimen recommendation, preferably part of the same sentence.
6. Reduced releases to a stream should not exceed a vertical drop of 6 inches in 6 hours. Fluctuations greater than this may significantly degrade aquatic resources.
7. Request that maximum flows released from dams not exceed twice the average flow. Prolonged releases of clear water greater than this will cause severe bank erosion and degrade the downstream aquatic environment.
8. Use "undepleted" USGS hydrology data for flow recommendations that relate to the stream in its pristine conditions (e.g., before dams, diversion, pumps, etc.). Otherwise, recommendations from the Montana Method may relate to depleted stream conditions and result in less than ideal flows.
9. Avoid recommending minimum instantaneous stream flow regimens less than 10% of the average flow since they will result in catastrophic degradation to fish and wildlife resources and harm both the aquatic and riparian environments. Encourage lawmakers to pass legislation that would prevent diversions or regulation at dams, whenever it would reduce streamflow below this level. If water development projects cannot make it on 90% of the water carried by a stream, use of the remaining 10% probably won't justify their projects. Philosophically, it is a crime against nature to rob a stream of that last portion of water so vital to the life forms of the aquatic environment that developed there over eons of time.

Note: Complete copies of this report can be obtained free by writing U.S. Fish and Wildlife Service, Federal Building, Billings, Montana 59101.

LITERATURE CITED

HEDMAN, E.R., and W.M. KASTNER. 1974. Progress report on streamflow—characteristics as related to channel geometry of streams in the Missouri River Basin. Open-File Rep. U.S. Geological Survey. 24 pp.

RANTZ, S.E. 1964. Stream hydrology related to the optimum discharge for king salmon spawning in the northern California coast ranges. U.S. Geological Survey Water Supply Pap. (1779-AA). 16 pp.

TENNANT, D.L. 1957-1975. Ecological Services studies and reports—major fish and/or wildlife input. (Unpublished list of RBS and ES reports.) 3 pp.

U.S. DEPARTMENT OF THE INTERIOR, GEOLOGICAL SURVEY. A proposed streamflow data program for [state].

WHELAN, D.E., and R.K. WOOD. 1962. Low-flow regulations as a means of improving stream fishing. Pages 375-386 *in* Proceedings of the Sixteenth Annual Conference, Southeastern Association of Game and Fish Commissioners, Charleston, S.C.

Please inform the office immediately of any error or change in your name or address. We are preparing our records for the new directory.

Attachment G

PA Natural Diversity Inventory (PNDI)

Re: Big Sewickley Creek Water Management Plan PNDI

The Pennsylvania Natural Diversity Inventory (PNDI) was originally consulted on 5/17/2021 (PNDI-734429) to determine the presence of threatened and endangered species and/or special concern species and resources within the project area. The review returned no known impacts. However, subsequent coordination with the Pennsylvania Fish and Boat Commission (PFBC) revealed a species of special concern (Southern Redbelly Dace) within the project area. Through further coordination with PFBC, it was determined that a passby flow of 30% of the average daily flow (ADF) for the months of October through March, and 50% of ADF from April through September would be protective of instream habitat and minimize decreases in wetted width.

On 1/26/2023 the PNDI was consulted (PNDI-777809) to ensure no new species of special concern were present in the project area. No new species were found, but the PFBC was again consulted regarding the intake location and associated structures. Through coordination with PFBC it was determined that the intake location and structures (illustrated in Attachment D) would not pose a threat of impingement or entrainment of aquatic life.

On 4/18/2023 the PNDI was consulted (PNDI-784938) at the direction of PADEP, to ensure that there will be no potential impacts to the northern long-eared bat. The PNDI showed that the bat is not a concern in the project area. PNDI-734429, PNDI-777809, and PNDI-784938, along with the associated correspondence with PFBC is included in this attachment.

1. PROJECT INFORMATION

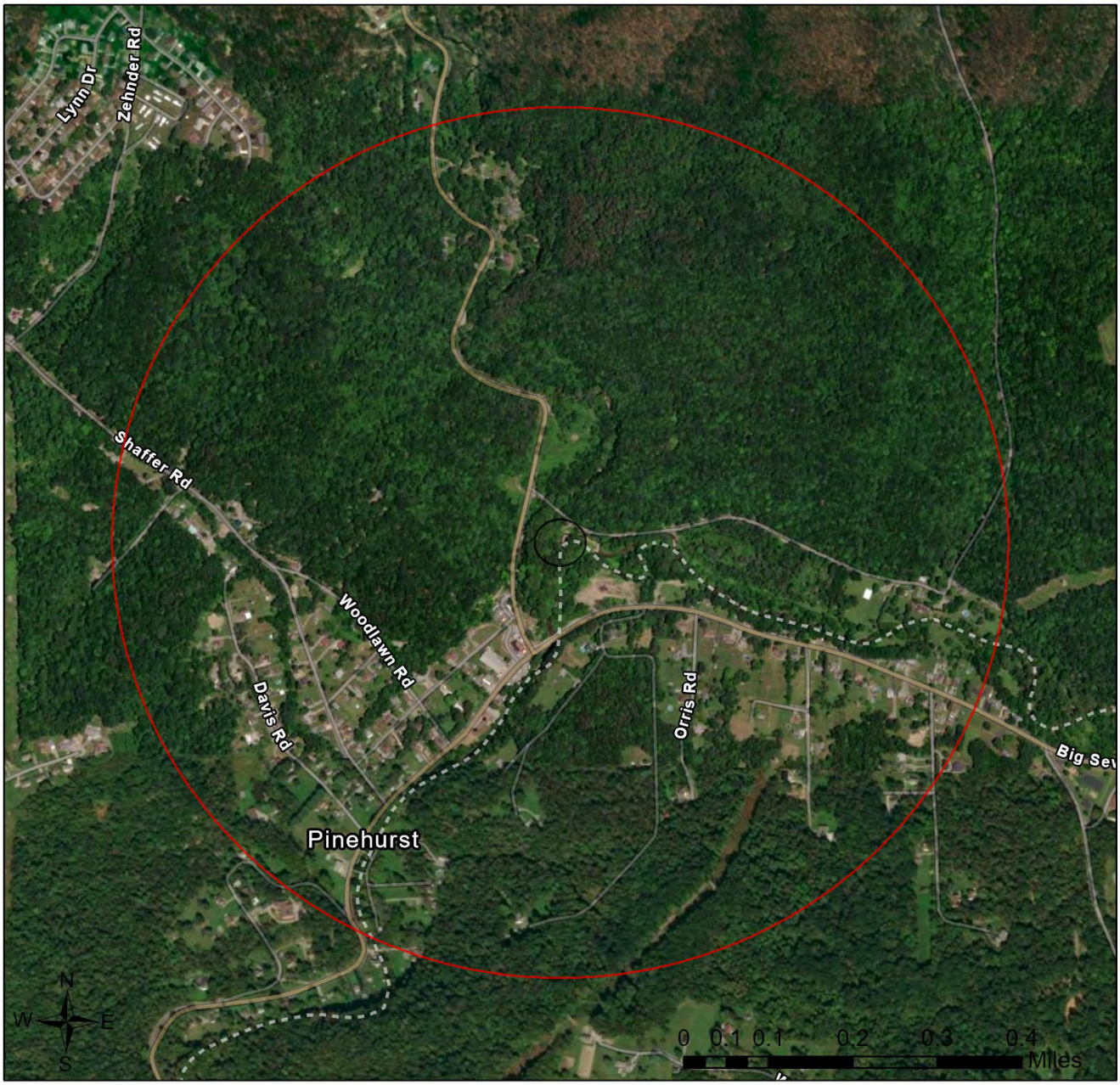
Project Name: **Big Sewickley Creek April 2023**
Date of Review: **4/18/2023 05:56:20 PM**
Project Category: **Water extraction/transfer, Extraction of surface water (e.g., from stream, river, creek, lake, or pond)**
Project Area: **1.72 acres**
County(s): **Allegheny; Beaver**
Township/Municipality(s): **BELL ACRES; ECONOMY**
ZIP Code:
Quadrangle Name(s): **AMBRIDGE**
Watersheds HUC 8: **Upper Ohio**
Watersheds HUC 12: **Big Sewickley Creek**
Decimal Degrees: **40.609354, -80.180373**
Degrees Minutes Seconds: **40° 36' 33.6753" N, 80° 10' 49.3414" W**

2. SEARCH RESULTS

Agency	Results	Response
PA Game Commission	No Known Impact	No Further Review Required
PA Department of Conservation and Natural Resources	No Known Impact	No Further Review Required
PA Fish and Boat Commission	No Known Impact	No Further Review Required
U.S. Fish and Wildlife Service	No Known Impact	No Further Review Required

As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate no known impacts to threatened and endangered species and/or special concern species and resources within the project area. Therefore, based on the information you provided, no further coordination is required with the jurisdictional agencies. This response does not reflect potential agency concerns regarding impacts to other ecological resources, such as wetlands.

Big Sewickley Creek April 2023

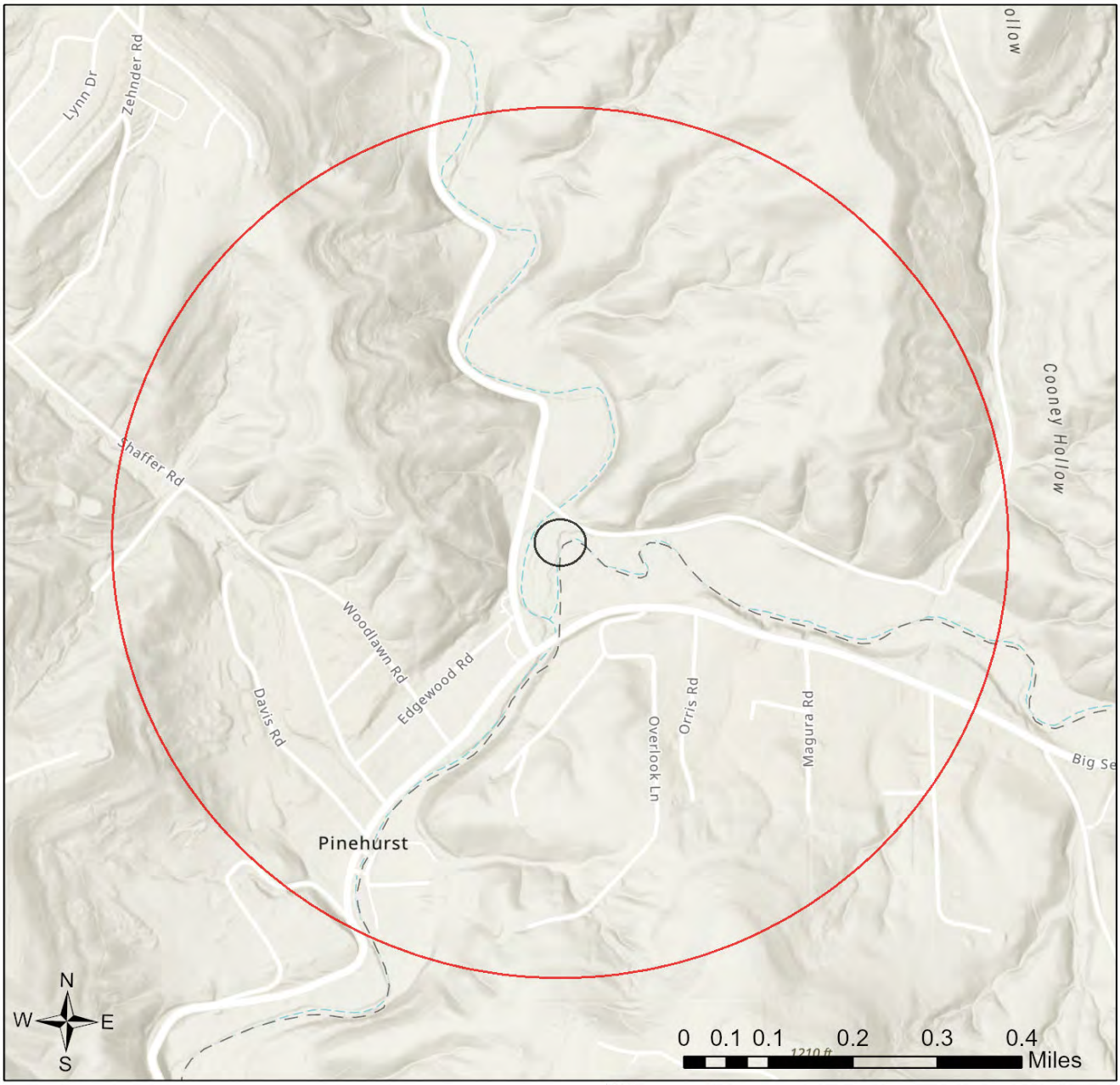


Buffered Project Boundary

Project Boundary

Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community

Big Sewickley Creek April 2023



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3. AGENCY COMMENTS

Regardless of whether a DEP permit is necessary for this proposed project, any potential impacts to threatened and endangered species and/or special concern species and resources must be resolved with the appropriate jurisdictional agency. In some cases, a permit or authorization from the jurisdictional agency may be needed if adverse impacts to these species and habitats cannot be avoided.

These agency determinations and responses are **valid for two years** (from the date of the review), and are based on the project information that was provided, including the exact project location; the project type, description, and features; and any responses to questions that were generated during this search. If any of the following change: 1) project location, 2) project size or configuration, 3) project type, or 4) responses to the questions that were asked during the online review, the results of this review are not valid, and the review must be searched again via the PNDI Environmental Review Tool and resubmitted to the jurisdictional agencies. The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer impacts than what is listed on this PNDI receipt. The jursidictional agencies **strongly advise against** conducting surveys for the species listed on the receipt prior to consultation with the agencies.

PA Game Commission

RESPONSE:

No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Department of Conservation and Natural Resources

RESPONSE:

No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Fish and Boat Commission

RESPONSE:

No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

U.S. Fish and Wildlife Service

RESPONSE:

No impacts to **federally** listed or proposed species are anticipated. Therefore, no further consultation/coordination under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq. is required. Because no take of federally listed species is anticipated, none is authorized. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other authorities.

4. DEP INFORMATION

The Pa Department of Environmental Protection (DEP) requires that a signed copy of this receipt, along with any required documentation from jurisdictional agencies concerning resolution of potential impacts, be submitted with applications for permits requiring PNDI review. Two review options are available to permit applicants for handling PNDI coordination in conjunction with DEP's permit review process involving either T&E Species or species of special concern. Under sequential review, the permit applicant performs a PNDI screening and completes all coordination with the appropriate jurisdictional agencies prior to submitting the permit application. The applicant will include with its application, both a PNDI receipt and/or a clearance letter from the jurisdictional agency if the PNDI Receipt shows a Potential Impact to a species or the applicant chooses to obtain letters directly from the jurisdictional agencies. Under concurrent review, DEP, where feasible, will allow technical review of the permit to occur concurrently with the T&E species consultation with the jurisdictional agency. The applicant must still supply a copy of the PNDI Receipt with its permit application. The PNDI Receipt should also be submitted to the appropriate agency according to directions on the PNDI Receipt. The applicant and the jurisdictional agency will work together to resolve the potential impact(s). See the DEP PNDI policy at https://conservationexplorer.dcnr.pa.gov/content/resources.

5. ADDITIONAL INFORMATION

The PNDI environmental review website is a preliminary screening tool. There are often delays in updating species status classifications. Because the proposed status represents the best available information regarding the conservation status of the species, state jurisdictional agency staff give the proposed statuses at least the same consideration as the current legal status. If surveys or further information reveal that a threatened and endangered and/or special concern species and resources exist in your project area, contact the appropriate jurisdictional agency/agencies immediately to identify and resolve any impacts.

For a list of species known to occur in the county where your project is located, please see the species lists by county found on the PA Natural Heritage Program (PNHP) home page (www.naturalheritage.state.pa.us). Also note that the PNDI Environmental Review Tool only contains information about species occurrences that have actually been reported to the PNHP.

6. AGENCY CONTACT INFORMATION

PA Department of Conservation and Natural Resources
Bureau of Forestry, Ecological Services Section
400 Market Street, PO Box 8552
Harrisburg, PA 17105-8552
Email: RA-HeritageReview@pa.gov

U.S. Fish and Wildlife Service
Pennsylvania Field Office
Endangered Species Section
110 Radnor Rd; Suite 101
State College, PA 16801
Email: IR1_ESPenn@fws.gov
NO Faxes Please

PA Fish and Boat Commission
Division of Environmental Services
595 E. Rolling Ridge Dr., Bellefonte, PA 16823
Email: RA-FBPACENOTIFY@pa.gov

PA Game Commission
Bureau of Wildlife Management
Division of Environmental Review
2001 Elmerton Avenue, Harrisburg, PA 17110-9797
Email: RA-PGC_PNDI@pa.gov
NO Faxes Please

7. PROJECT CONTACT INFORMATION

Name: Richard Watson
Company/Business Name: PennEnergy Resources, LLC
Address: 300 Westinghouse Drive, Suite 300
City, State, Zip: Cranberry, PA 16066
Phone:(412) 275-3200 Fax:( )
Email: rmwatson@pennenergyresources.com

8. CERTIFICATION

I certify that ALL of the project information contained in this receipt (including project location, project size/configuration, project type, answers to questions) is true, accurate and complete. In addition, if the project type, location, size or configuration changes, or if the answers to any questions that were asked during this online review change, I agree to re-do the online environmental review.

applicant/project proponent signature

4-21-2023
date

1. PROJECT INFORMATION

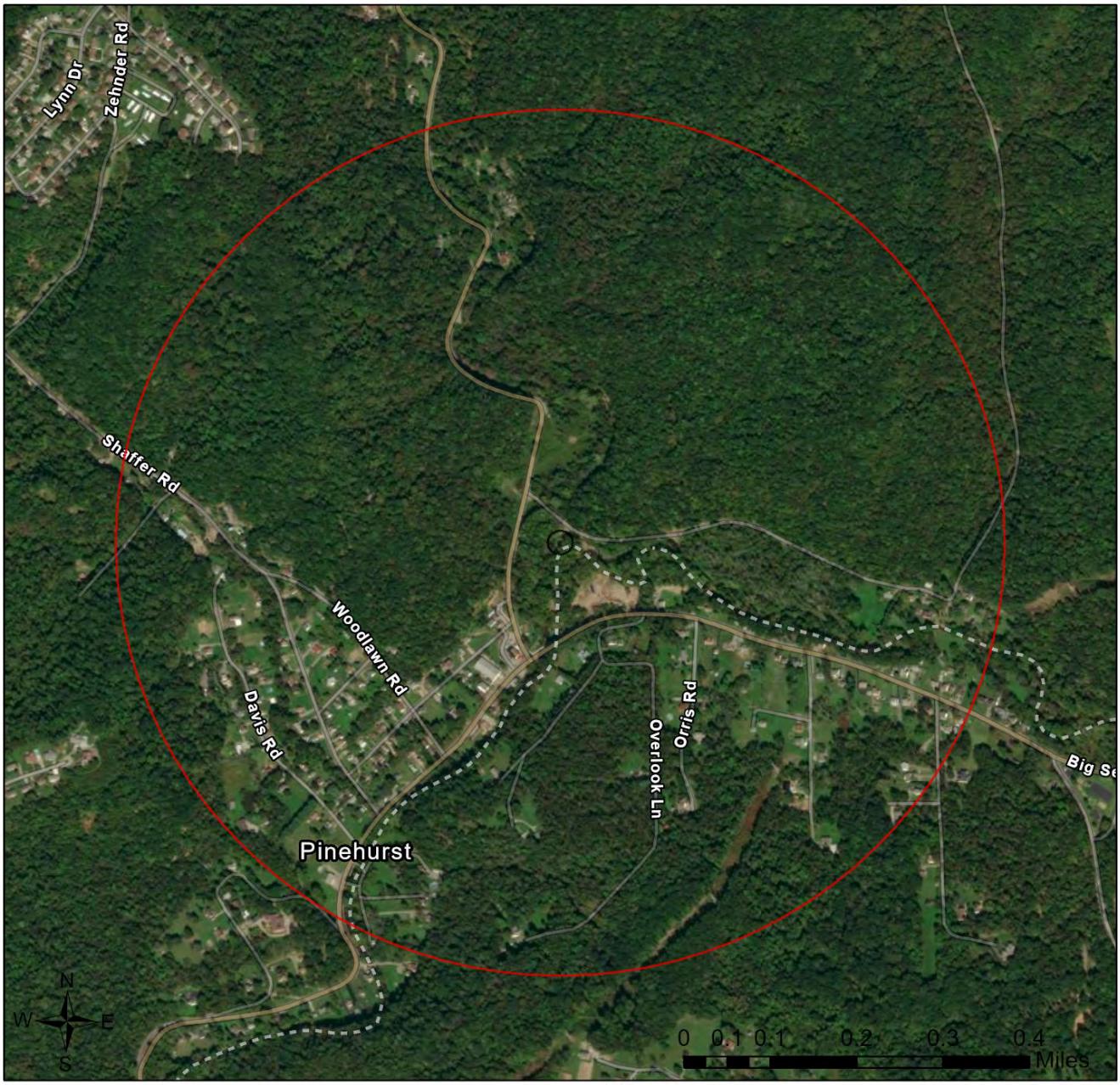
Project Name: **Big Sewickley Creek**
Date of Review: **1/26/2023 01:34:41 PM**
Project Category: **Water extraction/transfer, Extraction of surface water (e.g., from stream, river, creek, lake, or pond)**
Project Area: **0.40 acres**
County(s): **Allegheny; Beaver**
Township/Municipality(s): **BELL ACRES; ECONOMY**
ZIP Code:
Quadrangle Name(s): **AMBRIDGE**
Watersheds HUC 8: **Upper Ohio**
Watersheds HUC 12: **Big Sewickley Creek**
Decimal Degrees: **40.609445, -80.180310**
Degrees Minutes Seconds: **40° 36' 34.6" N, 80° 10' 49.1160" W**

2. SEARCH RESULTS

Agency	Results	Response
PA Game Commission	No Known Impact	No Further Review Required
PA Department of Conservation and Natural Resources	No Known Impact	No Further Review Required
PA Fish and Boat Commission	No Known Impact	No Further Review Required
U.S. Fish and Wildlife Service	No Known Impact	No Further Review Required

As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate no known impacts to threatened and endangered species and/or special concern species and resources within the project area. Therefore, based on the information you provided, no further coordination is required with the jurisdictional agencies. This response does not reflect potential agency concerns regarding impacts to other ecological resources, such as wetlands.

Big Sewickley Creek



Buffered Project Boundary

Project Boundary

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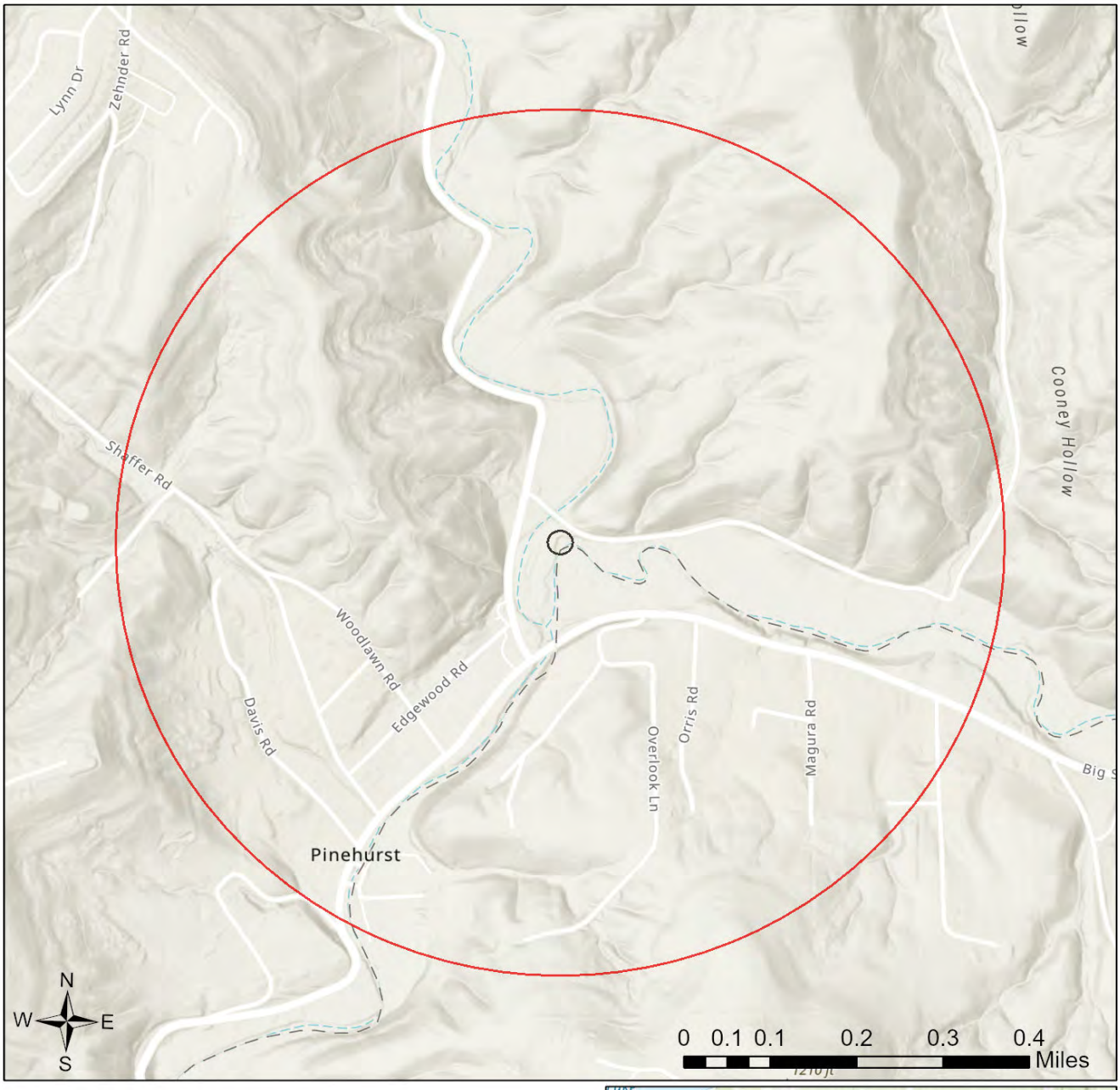

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PA Game Commission

RESPONSE:

No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Department of Conservation and Natural Resources

RESPONSE:

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PA Fish and Boat Commission

RESPONSE:

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U.S. Fish and Wildlife Service

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400 Market Street, PO Box 8552
Harrisburg, PA 17105-8552
Email: RA-HeritageReview@pa.gov

U.S. Fish and Wildlife Service
Pennsylvania Field Office
Endangered Species Section
110 Radnor Rd; Suite 101
State College, PA 16801
Email: IR1_ESPenn@fws.gov
NO Faxes Please

PA Fish and Boat Commission
Division of Environmental Services
595 E. Rolling Ridge Dr., Bellefonte, PA 16823
Email: RA-FBPACENOTIFY@pa.gov

PA Game Commission
Bureau of Wildlife Management
Division of Environmental Review
2001 Elmerton Avenue, Harrisburg, PA 17110-9797
Email: RA-PGC_PNDI@pa.gov
NO Faxes Please

7. PROJECT CONTACT INFORMATION

Name: Richard Watson
Company/Business Name: PennEnergy Resources, LLC
Address: 600 Cranberry Woods Dr, Suite 250
City, State, Zip: Cranberry Twp, PA 16066
Phone:(412) 935-5027 Fax:( )
Email: rmwatson@pennenergyresources.com

8. CERTIFICATION

I certify that ALL of the project information contained in this receipt (including project location, project size/configuration, project type, answers to questions) is true, accurate and complete. In addition, if the project type, location, size or configuration changes, or if the answers to any questions that were asked during this online review change, I agree to re-do the online environmental review.

applicant/project proponent signature

1-23-2023
date

1. PROJECT INFORMATION

Project Name: **Big Sewickley Creek**
Date of Review: **5/17/2021 02:12:14 PM**
Project Category: **Water extraction/transfer, Extraction of surface water (e.g., from stream, river, creek, lake, or pond)**
Project Area: **0.72 acres**
County(s): **Allegheny; Beaver**
Township/Municipality(s): **BELL ACRES; ECONOMY**
ZIP Code:
Quadrangle Name(s): **AMBRIDGE**
Watersheds HUC 8: **Upper Ohio**
Watersheds HUC 12: **Big Sewickley Creek**
Decimal Degrees: **40.609506, -80.180274**
Degrees Minutes Seconds: **40° 36' 34.2231" N, 80° 10' 48.9852" W**

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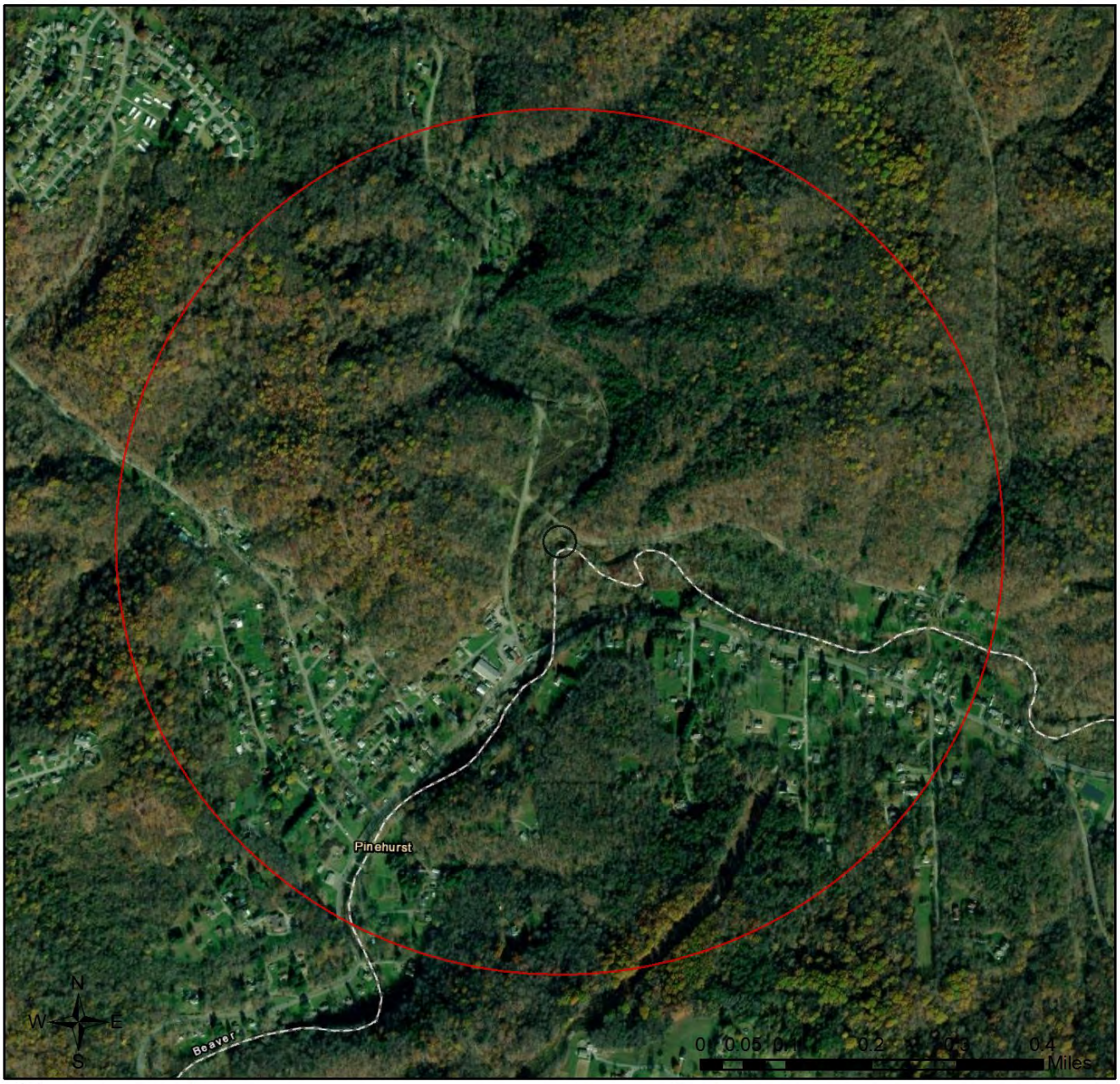
Big Sewickley Creek

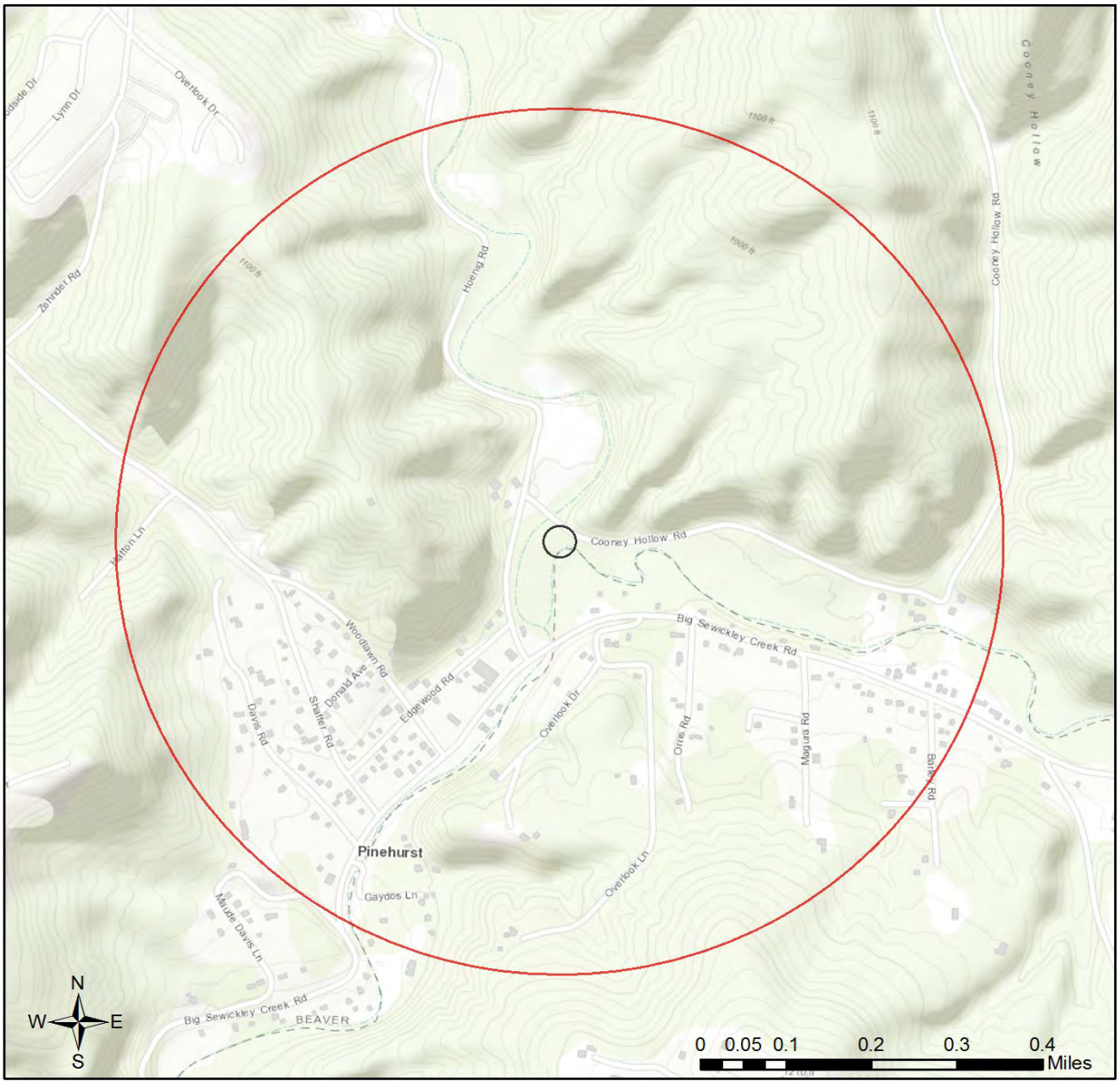


Project Boundary

Buffered Project Boundary

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China

Big Sewickley Creek



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PA Game Commission

RESPONSE:

No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Department of Conservation and Natural Resources

RESPONSE:

No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Fish and Boat Commission

RESPONSE:

No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

U.S. Fish and Wildlife Service

RESPONSE:

No impacts to **federally** listed or proposed species are anticipated. Therefore, no further consultation/coordination under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq. is required. Because no take of federally listed species is anticipated, none is authorized. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other authorities.

4. DEP INFORMATION

The Pa Department of Environmental Protection (DEP) requires that a signed copy of this receipt, along with any required documentation from jurisdictional agencies concerning resolution of potential impacts, be submitted with applications for permits requiring PNDI review. Two review options are available to permit applicants for handling PNDI coordination in conjunction with DEP's permit review process involving either T&E Species or species of special concern. Under sequential review, the permit applicant performs a PNDI screening and completes all coordination with the appropriate jurisdictional agencies prior to submitting the permit application. The applicant will include with its application, both a PNDI receipt and/or a clearance letter from the jurisdictional agency if the PNDI Receipt shows a Potential Impact to a species or the applicant chooses to obtain letters directly from the jurisdictional agencies. Under concurrent review, DEP, where feasible, will allow technical review of the permit to occur concurrently with the T&E species consultation with the jurisdictional agency. The applicant must still supply a copy of the PNDI Receipt with its permit application. The PNDI Receipt should also be submitted to the appropriate agency according to directions on the PNDI Receipt. The applicant and the jurisdictional agency will work together to resolve the potential impact(s). See the DEP PNDI policy at https://conservationexplorer.dcnr.pa.gov/content/resources.

5. ADDITIONAL INFORMATION

The PNDI environmental review website is a preliminary screening tool. There are often delays in updating species status classifications. Because the proposed status represents the best available information regarding the conservation status of the species, state jurisdictional agency staff give the proposed statuses at least the same consideration as the current legal status. If surveys or further information reveal that a threatened and endangered and/or special concern species and resources exist in your project area, contact the appropriate jurisdictional agency/agencies immediately to identify and resolve any impacts.

For a list of species known to occur in the county where your project is located, please see the species lists by county found on the PA Natural Heritage Program (PNHP) home page (www.naturalheritage.state.pa.us). Also note that the PNDI Environmental Review Tool only contains information about species occurrences that have actually been reported to the PNHP.

6. AGENCY CONTACT INFORMATION

PA Department of Conservation and Natural Resources
Bureau of Forestry, Ecological Services Section
400 Market Street, PO Box 8552
Harrisburg, PA 17105-8552
Email: RA-HeritageReview@pa.gov

U.S. Fish and Wildlife Service
Pennsylvania Field Office
Endangered Species Section
110 Radnor Rd; Suite 101
State College, PA 16801
Email: IR1_ESPenn@fws.gov
NO Faxes Please

PA Fish and Boat Commission
Division of Environmental Services
595 E. Rolling Ridge Dr., Bellefonte, PA 16823
Email: RA-FBPACENOTIFY@pa.gov

PA Game Commission
Bureau of Wildlife Habitat Management
Division of Environmental Planning and Habitat Protection
2001 Elmerton Avenue, Harrisburg, PA 17110-9797
Email: RA-PGC_PNDI@pa.gov
NO Faxes Please

7. PROJECT CONTACT INFORMATION

Name: RILEY WATSON
Company/Business Name: PENN ENERGY RESOURCES
Address: 600 CRANBERRY WOODS DR. SUITE 250
City, State, Zip: CRANBERRY TWP, PA, 16066
Phone: (412) 935-5027 Fax: ( )
Email: RMWATSON@PENNENERGYRESOURCES.com

8. CERTIFICATION

I certify that ALL of the project information contained in this receipt (including project location, project size/configuration, project type, answers to questions) is true, accurate and complete. In addition, if the project type, location, size or configuration changes, or if the answers to any questions that were asked during this online review change, I agree to re-do the online environmental review.

applicant/project proponent signature

7/2/2021
date

Pennsylvania Fish & Boat Commission
established 1866

Division of Environmental Services
Resource Extraction Section
595 E Rolling Ridge Dr.
Bellefonte, PA 16823

July 26, 2021

IN REPLY REFER TO
PNDI# 734429

Moody & Associates, Inc.
Jordan Bell
11548 Cotton Road
Meadville, Pennsylvania 16335

RE: Species Impact Review (SIR) – Rare, Candidate, Threatened and Endangered Species
PNDI Search No. 734429
Big Sewickley Creek
BEAVER County: Economy Borough

Dear Jordan Bell:

This responds to your inquiry about a Pennsylvania Natural Diversity Inventory (PNDI) Internet Database search on Big Sewickley Creek in Beaver County. These projects are screened for potential conflicts with rare, candidate, threatened or endangered species under Pennsylvania Fish & Boat Commission jurisdiction (fish, reptiles, amphibians, aquatic invertebrates only) using the Pennsylvania Natural Diversity Inventory (PNDI) database and our own files. These species of special concern are listed under the Endangered Species Act of 1973, the Wild Resource Conservation Act, and the Pennsylvania Fish & Boat Code (Chapter 75), or the Wildlife Code.

While no conflict was detected through the PNDI system, it has been brought to our attention that a threatened or endangered species is present in the project vicinity. The below species was detected in 2019 and a lag time between data collection and incorporation into the review tool, resulted in a "No Known Impact" letter. As noted on all PFBC PNDI response letters, "An absence of recorded species information does not necessarily imply species absence. Our data files and the PNDI system are continuously being updated with species occurrence information. Should project plans change or additional information on listed or proposed species become available, this determination may be reconsidered, and consultation shall be re-initiated". This letter shall be considered a formal PFBC species impact review for the Big Sewickley Creek water withdrawal project.

Southern Redbelly Dace (*Chrosomus erythrogaster,* PA Threatened)

The Southern Redbelly Dace is known to inhabit areas proximal to the project vicinity. These fish utilize shallow riffles to spawn during the summer months and are extremely sensitive to siltation and

loss of habitat due to low water levels. We are concerned that withdraws from the Sewickley Creek Watershed could have adverse effects on Southern Redbelly Dace populations. We recommend that an alternative water source be used to eliminate conflict with this imperiled species. If however, use of an alternative site is not possible, we request that justification for use of Big Sewickley Creek be provided; additionally, an on-site field view should be scheduled to discuss the project plans and address concerns.

If conflicts still exist, PFBC may request the completion of in-depth studies to provide base-line data that can be used to ensure the protection of Southern Redbelly Dace in the watershed.

This response represents the most up-to-date summary of the PNDI data and our files and is valid for two (2) years from the date of this letter. An absence of recorded species information does not necessarily imply species absence. Our data files and the PNDI system are continuously being updated with species occurrence information. Should project plans change or additional information on listed or proposed species become available, this determination may be reconsidered, and consultation shall be re-initiated.

If you have any questions regarding this review, please contact Dakota Raab at 814-359-5117 and refer to the PNDI # 734429. Thank you for your cooperation and attention to this important matter of species conservation and habitat protection.

Sincerely,

Dakota Raab, Fisheries Biologist
Resource Extraction Section

DR/dn

Pennsylvania Fish & Boat Commission
established 1866

Division of Environmental Services
Resource Extraction Section
595 E Rolling Ridge Dr.
Bellefonte, PA 16823

August 23, 2021

IN REPLY REFER TO
SIR# 54553
PNDI# 734429

Moody & Associates, Inc.
Jordan Bell
11548 Cotton Road
Meadville, Pennsylvania 16335

RE: Species Impact Review (SIR) – Rare, Candidate, Threatened and Endangered Species
PNDI Search No. 734425_1 & 734429
North Fork - Big Sewickley Creek & Big Sewickley Creek
BEAVER County: Economy Borough

Dear Jordan Bell:

This responds to your inquiry about a Pennsylvania Natural Diversity Inventory (PNDI) Internet Database search "potential conflict" or a threatened and endangered species impact review. These projects are screened for potential conflicts with rare, candidate, threatened or endangered species under Pennsylvania Fish & Boat Commission jurisdiction (fish, reptiles, amphibians, aquatic invertebrates only) using the Pennsylvania Natural Diversity Inventory (PNDI) database and our own files. These species of special concern are listed under the Endangered Species Act of 1973, the Wild Resource Conservation Act, and the Pennsylvania Fish & Boat Code (Chapter 75), or the Wildlife Code.

Southern Redbelly Dace (*Chrosomus erythrogaster*, PA Threatened)

On Tuesday, August 17, 2021 we conducted a field view to discuss the protection of this species and the needs of the proposed project. You have requested to withdrawal up to 2 MGD from Big Sewickley Creek and 1 MGD from North Fork Sewickley Creek and have proposed maintaining passby flow equal to 20% of the Average Daily Flow (ADF) in accordance with Susquehanna River Basin Commission (SRBC) Policy No. 2003-1. While both Big Sewickley Creek and North Fork Big Sewickley Creek are designated as trout stocked fisheries (TSF) by the Pennsylvania Department of Environmental Protection (DEP), due to the presence of this threatened species, we request that Policy No. 2003-1 guidance for High Quality (HQ) and Exceptional Value (EV) watersheds be followed. Policy No. 2003-1 states that "withdrawals may not cause greater than a 5% loss of habitat" and is based on SRBC Publication 191A. As such, we request that passby flow be adjusted to 25% and 35% for Big Sewickley and North Fork Big Sewickley Creek, respectively. Furthermore, we request that gaging stations be established at both locations as soon as practicable to build site specific curves for flow

estimation over the course of the withdrawals. Intake screen spacing and entrance velocities must not exceed 3/16" and 0.5 ft/sec as stated in the water management plan. Additionally, withdrawals from the Big Sewickley Creek site should be prioritized once waterlines and related infrastructure for transport to the B15 well pad are installed.

A report of total daily withdrawals shall be provided to this office on a monthly basis by mail or via email to draab@pa.gov while pumping operations are active. We also request that installation of pumps be coordinated with this office and our regional Waterways Conservation Officer Matthew Raetsch at mraetsch@pa.gov.

Provided that these requirements and best management practices are followed, I do not anticipate the proposed activity having any significant adverse impacts to Southern Redbelly Dace populations in the Big Sewickley Creek Watershed.

This response represents the most up-to-date summary of the PNDI data and our files and is valid for two (2) years from the date of this letter. An absence of recorded species information does not necessarily imply species absence. Our data files and the PNDI system are continuously being updated with species occurrence information. Should project plans change or additional information on listed or proposed species become available, this determination may be reconsidered, and consultation shall be re-initiated.

If you have any questions regarding this review, please contact Dakota Raab at 814-359-5117 and refer to the SIR # 54553. Thank you for your cooperation and attention to this important matter of species conservation and habitat protection.

Sincerely,

Dakota Raab, Fisheries Biologist
Resource Extraction Section

DR/dn

pennsylvania
FISH AND BOAT COMMISSION

August 5, 2022

IN REPLY REFER TO
SIR# 56633

Moody & Associates, Inc.
Jordan Bell
11548 Cotton Road
Meadville, Pennsylvania 16335

RE: Species Impact Review (SIR) – Rare, Candidate, Threatened and Endangered Species
PNDI Search No. 734429
Big Sewickley Creek Withdrawal
Economy Borough: BEAVER County

Dear Jordan Bell:

This responds to your inquiry about a Pennsylvania Natural Diversity Inventory (PNDI) Internet Database search "potential conflict" or a threatened and endangered species impact review. These projects are screened for potential conflicts with rare, candidate, threatened or endangered species under Pennsylvania Fish and Boat Commission jurisdiction (fish, reptiles, amphibians, aquatic invertebrates only) using the Pennsylvania Natural Diversity Inventory (PNDI) database and our own files. These species of special concern are listed under the Endangered Species Act of 1973, the Wild Resource Conservation Act, and the Pennsylvania Fish and Boat Code (Chapter 75), or the Wildlife Code.

Southern Redbelly Dace (*Chrosomus erythrogaster*, PA Threatened)

PennEnergy Resources has requested to withdrawal 1.5 million gallons of water per day from Big Sewickley Creek for development of the B50 well-pad. Ongoing coordination with this office has led to reductions in the proposed daily withdrawal volume from Big Sewickley Creek and the abandonment of plans to withdrawal water from North Fork Big Sewickley Creek. Through coordination, we have requested that multiple methods be employed to estimate water level changes in Big Sewickley Creek resulting from the proposed withdrawal. This level of analysis was requested to evaluate potential impacts to the Southern Redbelly Dace and its habitat.

To date, four iterations of the Big Sewickley Creek water management plan (WMP) have been submitted for review. At our recommendation, you submitted an amended plan on March 10, 2022 following pass-by flow recommendations outlined in the Susquehanna River Basin Commission's *Low Flow Protection Policy* (Policy # 2003-01) utilizing stream discharge information derived from the United State Geological Service's (USGS) online StreamStats application. Due to ongoing concerns for potential impacts to instream habitat for the Southern Redbelly Dace, we requested that a similar analysis be performed employing the Tennant Method based on instream flow statistics calculated from decommissioned USGS gauge # 03086110. An additional WMP amendment describing the potential impact of the project utilizing these recommendations was submitted on July 15, 2022.

We have reviewed both the submitted plans and request that the recommendations outlined using the Tennant Method be applied to instream flow estimates provided by the USGS StreamStats online application for Big Sewickley Creek. The Tennant method recommends a pass by flow of 30% of the average daily flow (ADF) for the months of October through March and 50% of the ADF from April to September. This pass by flow recommendation is deemed to be protective of instream habitat minimizing decreases in wetted width. Please amend the WMP using the recommendation described above for our review and concurrence.

If approved, we request that a report detailing daily withdrawals be provided to this office on a monthly basis via email (draab@pa.gov). Additionally, we request that installation of pumps be coordinated with this office.

This response supersedes our letter of August 23, 2021 for PNDI # 734429 & 734425 and represents the most up-to-date summary of the PNDI data and our files and is valid for two (2) years from the date of this letter. An absence of recorded species information does not necessarily imply species absence. Our data files and the PNDI system are continuously being updated with species occurrence information. Should project plans change or additional information on listed or proposed species become available, this determination may be reconsidered, and consultation shall be re-initiated.

If you have any questions regarding this review, please contact Dakota Raab at 814-359-5117 or draab@pa.gov and refer to the SIR # 56633. Thank you for your cooperation and attention to this important matter of species conservation and habitat protection.

Sincerely,

Dakota Raab, Fisheries Biologist
Resource Extraction Section

/DR/dn

From:	Allison, Jordan
To:	Richard M. Watson; Raab, Dakota
Cc:	Scott M. Sweder; Kanouff, Paul; Paul Martin; Scicchitano, Vincent; Lutz, Samantha
Subject:	RE: [External] Big Sewickley Creek Species Impact Review Update
Date:	Thursday, March 9, 2023 11:39:18 AM
Attachments:	image001.png image003.png inky-injection-inliner-kWwuPnNeZC8yR85B9161PQ.png inky-injection-inliner-b0LUiNNIz82Gv_IJfK-faq.png

Rich,

Removing the intake while not in use alleviates any additional concerns the Commission has. I am looping Samantha Lutz back in to make her aware of our additional coordination in the email chain below.

Thanks,

Jordan Allison | Fisheries Biologist
Pennsylvania Fish and Boat Commission | Environmental Services
595 East Rolling Ridge Drive | Bellefonte, PA 16823
Phone: 814.359.5236 | Fax: 814.359.5175
fishandboat.com

From: Richard M. Watson <RMWatson@pennenergyresources.com>
Sent: Thursday, March 9, 2023 10:57 AM
To: Allison, Jordan <jorallison@pa.gov>; Raab, Dakota <draab@pa.gov>
Cc: Scott M. Sweder <smsweder@pennenergyresources.com>; Kanouff, Paul <pkanouff@cecinc.com>; Paul Martin <PMartin@moody-s.com>; Scicchitano, Vincent <vscicchitano@cecinc.com>
Subject: Re: [External] Big Sewickley Creek Species Impact Review Update

Jordan,

Thank you for the reply.

The intake raft will be removed from the stream when not in use. Let me know if you have any other questions.

Best Regards,
Rich

Richard Watson

Manager, Permitting and Compliance
PennEnergy Resources

From: Allison, Jordan <jorallison@pa.gov>
Sent: Thursday, March 9, 2023 9:27:58 AM
To: Richard M. Watson <RMWatson@pennenergyresources.com>; Raab, Dakota <draab@pa.gov>
Cc: Scott M. Sweder <smsweder@pennenergyresources.com>; Kanouff, Paul <pkanouff@cecinc.com>; Paul Martin <PMartin@moody-s.com>; Scicchitano, Vincent <vscicchitano@cecinc.com>
Subject: RE: [External] Big Sewickley Creek Species Impact Review Update

Rich,

According to the table contained in the notes of Drawing JP01, the water surface elevation of Big Sewickley Creek at the 30% passby flow threshold within the pool the intake will be located in is 787.50'. The surveyed cross sections of the creek (A-A and B-B) indicate the distance from the intake to the stream bottom will be 1.7' and 1.4' respectively at that water surface elevation which is the worst case scenario. Since the intakes were designed according to Commission's recommendation to have a through screen velocity of 0.5 ft/ second or less, I would not think any impacts to the streambed would be expected as a result of the intakes "vacuuming" up sediment in this scenario. The only question that remains, is do you plan to remove the intake raft from the stream when it is not in use? Removing the intake raft when not in use may prevent streambed scour and damage to the equipment from both high and low flow events.

Thanks,

Jordan Allison | Fisheries Biologist
Pennsylvania Fish and Boat Commission | Environmental Services
595 East Rolling Ridge Drive | Bellefonte, PA 16823
Phone: 814.359.5236 | Fax: 814.359.5175
fishandboat.com

From: Richard M. Watson <RMWatson@pennenergyresources.com>
Sent: Wednesday, March 8, 2023 4:22 PM
To: Allison, Jordan <jorallison@pa.gov>; Raab, Dakota <draab@pa.gov>
Cc: Scott M. Sweder <smsweder@pennenergyresources.com>; Kanouff, Paul <pkanouff@cecinc.com>; Paul Martin <PMartin@moody-s.com>; Scicchitano, Vincent <vscicchitano@cecinc.com>
Subject: RE: [External] Big Sewickley Creek Species Impact Review Update

Good Afternoon, Jordan,

Just left you a voicemail about the wording in the comment and concerns that your email might not fully address what Ms. Lutz is looking for. The comment specifically mentions not causing disturbance to the stream bed – most notably 1.e. and 1.f. below. Do you have enough information to make the statement that the withdrawal as designed will prevent impingement and entrainment AND is of sufficient depth for a withdrawal to occur with no disturbance to the stream bed?

I've removed Ms. Lutz from the email chain as to avoid any confusion if you don't concur.

The comment is as follows:

1) . Please address the following comments in order to justify that the intake will remain floating and not cause disturbance to the stream bed. 25 Pa. Code §105.13 (e)(l); §105.14 (b) & (c); § 78a.69 (b) (2); § 78a.69 (c) (6)

    a. Provide the surveyed ground (stream bed bottom) elevation of Big Sewickley Creek at the proposed withdrawal location.
    b. Provide a justification that the delineated max pool depth is an adequate representative of the normal pool depth of Big Sewickley Creek. The actual normal pool depth should be reflected.
    c. In addition to the normal pool depth, update Cross-section A-A to show the water elevations associated with the required flow rates (i.e. 8.8 and 13.1 cfs) for the full withdrawal rate to occur.
    d. Show the actual dimensions of the dolphin intake(s) that will be utilized during withdrawals.
    e. Document that the water elevations at various flows is of sufficient depth for a withdrawal to occur without stream bed disturbance. Specifically, the

location of the intake structure, normal pool depth at that location, 30 % average daily flow pass by, 50% average daily flow pass by, and the depth of the intake structure should be evaluated so that stream bed disturbance is minimized. It is suggested that the PA Fish and Boat Commission's Recommendations Surface Water Intake Design Criteria to Reduce Aquatic Species Impacts be followed as it relates to habitat selection.

f. Provide a stream profile through each of the seven (7) intake structure locations clearly depicting that each individual intake structure is suspended at a sufficient depth for a withdrawal to occur and that no streambed impacts will occur.

The PA Fish and Boat Commission (PBFC) also noted the inconsistencies in pool levels on September

27, 2022, when water levels present at the withdrawal location were stated to only be six inches; that the cross-section of Big Sewickley is changing, and that there may be times that the proposed floating intake exceeds the depth of water of Big Sewickley Creek. Please evaluate the notations of the PBFC in your analysis and when updating the Operations Plan intake profile.

Sorry I didn't provide this information earlier to avoid revisions. Please feel free to call if anything warrants a discussion. Let me know your thoughts when you can. Thanks.

Best Regards,
Rich

Richard Watson/Manager, Permitting and Compliance
PennEnergy Resources, LLC
600 Cranberry Woods Drive, Suite 250
Cranberry Township, PA 16066
O (412) 935-5027
C (724) 288-1987
rmwatson@pennenergyresources.com
www.pennenergyresources.com

From: Allison, Jordan <jorallison@pa.gov>
Sent: Wednesday, March 8, 2023 12:01 PM
To: Richard M. Watson <RMWatson@pennenergyresources.com>; Raab, Dakota <draab@pa.gov>
Cc: Scott M. Sweder <smsweder@pennenergyresources.com>; Kanouff, Paul <pkanouff@cecinc.com>; Paul Martin <PMartin@moody-s.com>; Scicchitano, Vincent <vscicchitano@cecinc.com>; Lutz, Samantha <samlutz@pa.gov>
Subject: RE: [External] Big Sewickley Creek Species Impact Review Update

Mr. Watson,

I have reviewed the revised plans you and Dakota discussed last week concerning meeting the Commission's recommendations for water depth when citing floating surface water intakes. Reorienting the intake "raft" to be perpendicular to flow along its longest access shifts it slightly down stream into deeper water as per the Stream Bed Profile (H-H). This change increases the water depth from your initial proposal to a minimum of 2.8 feet at a normal pool elevation of 787.68'. This change alleviates our concern for the impingement and entrainment of aquatic life resolving any outstanding coordination for threatened or endangered species with the Commission. Please note that I have copied the Samantha Lutz of the Departments Southwest Regional Office to make her aware of our coordination. Thank you for your consideration and let me know if you have any questions.

Sincerely,

Jordan Allison | Fisheries Biologist
Pennsylvania Fish and Boat Commission | Environmental Services
595 East Rolling Ridge Drive | Bellefonte, PA 16823
Phone: 814.359.5236 | Fax: 814.359.5175
fishandboat.com

From: Richard M. Watson <RMWatson@pennenergyresources.com>
Sent: Monday, March 6, 2023 3:27 PM
To: Raab, Dakota <draab@pa.gov>
Cc: Allison, Jordan <jorallison@pa.gov>; Scott M. Sweder <smsweder@pennenergyresources.com>; Kanouff, Paul <pkanouff@cecinc.com>; Paul Martin <PMartin@moody-s.com>; Scicchitano, Vincent <vscicchitano@cecinc.com>
Subject: RE: [External] Big Sewickley Creek Species Impact Review Update

Good Afternoon,

As discussed last week, attached is the updated site plan and cross sections for PennEnergy's proposed Big Sewickley Creek for your review. The strainer intake orientation, cross sections, and pool elevation have been revised. Please let me know if you have any questions or need anything further for your review.

Best Regards,
Rich

Richard Watson/Manager, Permitting and Compliance
PennEnergy Resources, LLC
600 Cranberry Woods Drive, Suite 250
Cranberry Township, PA 16066

O (412) 935-5027
C (724) 288-1987
rmwatson@pennenergyresources.com
www.pennenergyresources.com

From: Richard M. Watson <RMWatson@pennenergyresources.com>
Sent: Friday, March 3, 2023 5:08 PM
To: Raab, Dakota <draab@pa.gov>
Cc: Allison, Jordan <jorallison@pa.gov>; Scott M. Sweder <smsweder@pennenergyresources.com>; Kanouff, Paul <pkanouff@cecinc.com>; Paul Martin <PMartin@moody-s.com>; Scicchitano, Vincent <vscicchitano@cecinc.com>
Subject: Re: [External] Big Sewickley Creek Specie Impact Review Update

Thanks, Dakota and Jordan. I appreciate the update.

Best Regards,
Rich

Richard Watson
Manager, Permitting and Compliance
PennEnergy Resources

From: Raab, Dakota <draab@pa.gov>
Sent: Friday, March 3, 2023 3:25:51 PM
To: Richard M. Watson <RMWatson@pennenergyresources.com>
Cc: Allison, Jordan <jorallison@pa.gov>; Scott M. Sweder <smsweder@pennenergyresources.com>; Kanouff, Paul <pkanouff@cecinc.com>; Paul Martin <PMartin@moody-s.com>; Scicchitano, Vincent <vscicchitano@cecinc.com>
Subject: RE: [External] Big Sewickley Creek Specie Impact Review Update

Rich,

I will be on vacation next week (3/6 - 3/13) and will likely be unavailable to approve the revisions we discussed on the phone today. I have kept Jordan Allison up to date on our coordination. Please keep Jordan copied when you provide the updated plan so he is able to give comments/approval to DEP next week.

Thanks,

Dakota

Dakota Raab | Fisheries Biologist
Pennsylvania Fish and Boat Commission | Resource Extraction Section
595 E. Rolling Ridge Drive | Bellefonte, PA 16841
Office: 814.359.5117 | Fax: 814.359.5175
fishandboat.com

From: Richard M. Watson <RMWatson@pennenergyresources.com>
Sent: Wednesday, March 1, 2023 10:18 AM
To: Raab, Dakota <draab@pa.gov>
Cc: Allison, Jordan <jorallison@pa.gov>; Scott M. Sweder <smsweder@pennenergyresources.com>; Kanouff, Paul <pkanouff@cecinc.com>; Paul Martin <PMartin@moody-s.com>; Scicchitano, Vincent <vscicchitano@cecinc.com>
Subject: [External] Big Sewickley Creek Specie Impact Review Update

Good Morning, Dakota,

Thanks for taking my call this morning, Attached for your review and approval are the updated PNDI's for PennEnergy Resources' proposed B50 Temporary Waterline Project and the Big Sewickley Creek Intake, along with the revised site plan, cross sections, and KMZ files for reference.

As discussed, the intake location has moved downstream approximately 70'. However, all other project details and parameters will remain largely the same. PennEnergy still plans to withdraw up to 1.5 million gallons per day at the site, using the Tennant Method for determining minimum pass-by standards for "Excellent" of 30% and 50% ADF, utilizing floating dolphin strainer intakes, and other parameters previously approved in SIR#56633, dated August 5, 2022, also attached. The temporary waterline will not have any in stream work associated with construction, operation, removal or restoration.

We plan to resubmit the various applications with this information to DEP as soon as we hear back from you.

Please let me know if you have any questions, comments, recommendations or need anything else for your review.

Best Regards,
Rich

Richard Watson/Manager, Permitting and Compliance
PennEnergy Resources, LLC
600 Cranberry Woods Drive, Suite 250
Cranberry Township, PA 16066
O (412) 935-5027
C (724) 288-1987
rmwatson@pennenergyresources.com
www.pennenergyresources.com

Attachment H

PA Historic and Museum Commission (PHMC)

Pennsylvania State Historic Preservation Office
PENNSYLVANIA HISTORICAL AND MUSEUM COMMISSION

January 25, 2023

Keith Held
Moody and Associates Inc.
11548 Cotton Rd, Suite 101
Meadville PA 163350000

RE: ER Project # 2023PR00345.001, Big Sewickley Creek, Department of Environmental Protection, Economy Borough, Beaver County

Dear Keith Held:

Thank you for submitting information concerning the above referenced project. The Pennsylvania State Historic Preservation Office (PA SHPO) reviews projects in accordance with state and federal laws. Section 106 of the National Historic Preservation Act of 1966, and the implementing regulations (36 CFR Part 800) of the Advisory Council on Historic Preservation, is the primary federal legislation. The Environmental Rights amendment, Article 1, Section 27 of the Pennsylvania Constitution and the Pennsylvania History Code, 37 Pa. Cons. Stat. Section 500 et seq. (1988) is the primary state legislation. These laws include consideration of the project's potential effects on both historic and archaeological resources.

Above Ground Resources
No Above Ground Concerns - Environmental Review - No Effect - Above Ground

Based on the information received and available within our files, it is our opinion that the proposed project will have No Effect on above ground historic properties, including historic buildings, districts, structures, and/or objects, should they exist. Should the scope of the project change and/or should you be made aware of historic property concerns, you will need to reinitiate consultation with our office using PA-SHARE.

For questions concerning above ground resources, please contact Emma Diehl at emdiehl@pa.gov.

Archaeological Resources
No Archaeological Concerns - Environmental Review - No Effect - Archaeological

Based on the information received and available in our files, in our opinion, the proposed project should have No Effect on archaeological resources. Our analysis indicates that archaeological resources are potentially located in this project area. Should the scope of the project be amended to include additional ground-disturbing activity and/or should you be made aware of historic property concerns, you will need to reinitiate consultation with our office using PA-SHARE.

For questions concerning archaeological resources, please contact Emma Diehl at emdiehl@pa.gov.

Sincerely,

Emma Diehl
Environmental Review Division Manager

Groundwater and Environmental Professionals Since 1891

January 25, 2023

Pennsylvania Historical and Museum Commission
Bureau of Historic Preservation
400 North Street, Second Floor
Harrisburg, PA 17120-0093

RE: Cultural Resource Notice
PennEnergy Resources, LLC
Big Sewickley Creek Water Management Plan
Economy Borough, Beaver County, PA

Sent via email

To whom it may concern:

The enclosed information is being submitted on behalf of:

PennEnergy Resources, LLC
1000 Commerce Drive, Park Place One
Suite 400
Pittsburgh, PA 15275

On behalf of PennEnergy Resources, LLC, Moody and Associates, Inc. have prepared this project summary in order to submit a Cultural Resource Notice for a water withdrawal permit. We are requesting a cultural resource review for the below site at your earliest convenience.

Project Location:

Township/Municipality:	Economy Borough
County:	Beaver County, PA
USGS Topographic Quadrangle:	Ambridge, PA
Coordinates:	40.6094º N
	80.1804º W

Map: A 7.5' USGS topographic quadrangle map, FIGURE 1, is attached that shows the project location.

Project Description/Scope: PennEnergy is proposing to install a surface water withdrawal system within Big Sewickley Creek in Economy Borough, Beaver County. The system will

include the use of a water pump, intake, and water line that will all be on the surface and temporary.

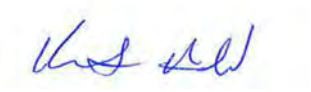
Acreage and Habitat to be Impacted: The source is located on private property located south of Cooney Hollow Road in Economy Borough, Beaver County, Pennsylvania. The project area is less than 1 acre with 0 acres of earth disturbance. Also, there will be no buildings within the project boundary and no buildings being demolished. The withdrawal system is temporary, with no excavation or ground disturbing activities anticipated during the installation, operation, and eventual removal of the system.

Site Plans/Drawings: No buildings are presently on the site and no construction of buildings is proposed. A conceptual design of the site is attached as FIGURE 2.

Photographs: No photographs of the site are available. Aerial imagery is provided in FIGURE 2.

Please contact me at (814)-724-4970 if you should have any questions concerning this project.

Sincerely,
Moody and Associates, Inc.



Keith Held
Environmental Scientist II

Enclosures

Legend

- Withdrawal Point

Scale:
1 in = 2,000 ft

0 1,000 2,000
Feet

Prepared for:
PENNENERGY RESOURCES

Map Reference:

Basemap: ESRI Basemap,
USA Topo Maps
USGS Topographic 7.5' Quadrangle:
Ambridge, PA

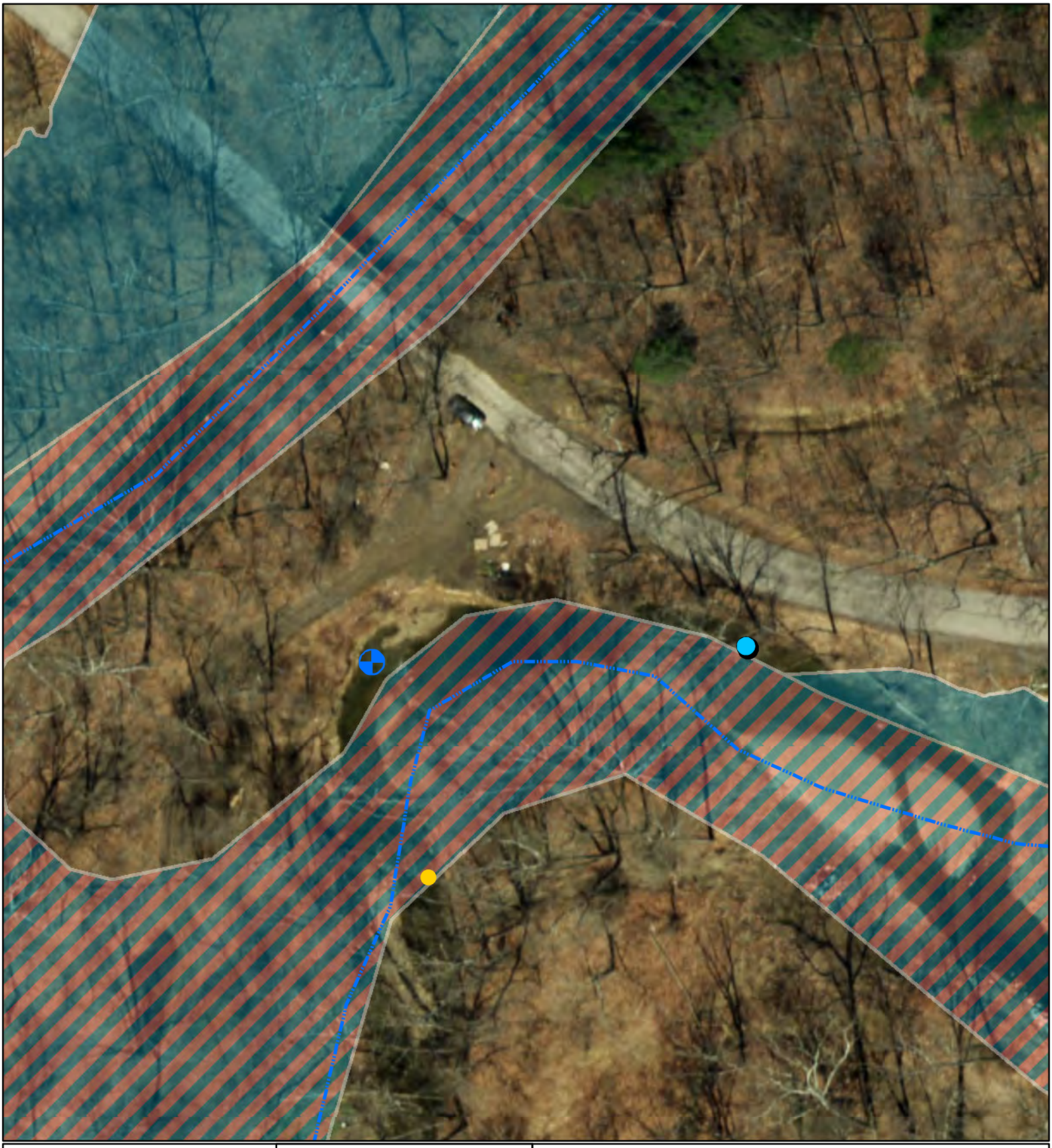
Projected Coordinate System:
NAD_1983_StatePlane_Pennsylvania_South
_FIPS_3702_Feet

FIGURE 1
Withdrawal Location Map
Big Sewickley Creek
Beaver County, Pittsburgh, PA

Project #: 12-115-CO

Drawn by:	Checked by:	Date:	Revision:
CJB	JWB	5/18/2021	0

11548 Cotton Road
Suite 101
Meadville, Pa 16335
814.724.4970 voice
814.724.4973 fax
www.moody-s.com
Moody AND ASSOCIATES, INC.



FEMA Special Flood Hazard Areas

- Zone AE
- Floodway
- Stream Profile Baseline
- Surface Intake
- Upstream Gage Location
- Downstream Gage Location

Scale: 1 in = 50 ft

0 25 50

Feet

Prepared for:

PENNENERGY RESOURCES

Map Reference:

Basemap: ArcGIS Map Service
https://imagery.pasda.psu.edu/ArcGIS/services/pasda/PEMAImagery2018

Flood Data: National Flood Hazard Layer - Beaver County, 2019 - Federal Emergency Management Agency,https://maps.pasda.psu.edu/ArcGIS/rest/services/pasda/FEMA_NationalFloodHazardLayer_PA/MapServer

NAD_1983_StatePlane_Pennsylvania_South_FIPS_3702_Feet

FIGURE 2
INTAKE & GAGE LOCATION MAP

PennEnergy Resources, LLC
North Fork Big Sewickley Creek Intake
New Sewickley Township, Beaver County, PA

Project #: 12-115-CO

Drawn by:	Checked by:	Date:	Revision:
CJB	PJM	9/21/2022	2

11548 Cotton Road
Suite 101
Meadville, Pa 16335
814.724.4970 voice
814.724.4973 fax
www.moody-s.com

Moody AND ASSOCIATES, INC.

PROJECT Big Sewickley Creek

2023PR00345
Environmental Review

Summary | Resources and Surveys

Open (1) — Under Review (2) — Opinion (3) — Pending Mitigation (4) — Closed (5)

Preservation Planning Goals

1.4 2.1 2.2 2.3 2.4 2.5 3.1 3.5 3.6 4.1 4.4 4.5

	Open	Closed
Submissions	0	1
Requests	0	0
Resources	0	0

Project Summary

Project Name
Big Sewickley Creek

Project Description
Surface Water Withdrawal

Legacy Number
No Data

Comments
No Data

Date Created
01/25/2023

Created By
Emma Diehl

Date Closed
01/25/2023

Closed By
Emma Diehl

Submitted from PATH

Environmental Review

Involves Ground Disturbance

10 or More Resources in the APE

Present Land Use

Private and undeveloped

Past Land Use

Private and undeveloped

One or More Above Ground Resources 45 Years in Age or Older

Approximate Age of Buildings

No Data

This project includes

✔ Construction Demolition Rehabilitation Disposition

Opinion

No Effect

Opinion Date

01/25/2023

Opinion Comment

No Data

Environmental Review Location

Ape Location Description

Installation of temporary surface water withdrawal system on an area less than 1 acre consisting of a water pump, intake, and waterline. All

activities will occur on the surface and are temporary.

Lod Location Description
No Data

Ape Acreage
0.39

Lod Acreage

Project Address
South of Cooney Hollow Rd

Project City
Economy

Project State
PA

Project Zip
151430000

This project includes

- Project Located On Federal
- Project Located On State
- Project Located On Municipal
- ✔ Project Located On Private

Submissions

Go To	Clock	Due Date	Type	Status	Submission ↑	Submitted By	Description
	Closed	02/08/2023	Initial	Closed	2023PR00345.001	Keith Held	Initial Submission

Submissions: 1

Other Project Names

Project Name
No records have been added.

Other Project Names: 0

Municipalities

Municipality	County
Economy Borough	Beaver

Municipalities: 2

Agencies

Agency	Code	Type	Program / Permit Name	Program / Permit / Tracki...	Pr
Department of Environment...	**DEP**	**State**	**Clean Water / Water Manag...**	**Surface Water Withdrawal**	**Ye**

Agencies: 1

Contacts

VIEW

Email	First Name	Last Name	Title
kheld@moody-s.com	**Keith**	**Held**	**Environmental Scientist II**

Contacts: 1

Project Photos

VIEW

Image	Name	Date	Date Created	Description
No photos have been added.				

Photos: 0

Project Documents

VIEW

Attachment Type	Attachment Name	Date Created	Submission Number
Document	Big Sewickley Creek Water	01/25/2023	2023PR00345.001

Attachments: 1

SHPO Response Attachments

VIEW

Attachment Type	Attachment Name	Date Created	Submission Number
Correspondence	ER Summary Letter	01/25/2023	

Attachments: 1

Inquiries

Request Item	Request	Response
No records have been added.		

Inquiries: 0

Associated Projects

VIEW

Go To	Number	Name
No records have been added.		

Projects: 0

Project Agreements

VIEW

Go To	Name	Type
No records have been added.		

Agreements: 0

Engagements

VIEW

Date ↓	Name	Engagement Number	Audience	Type	Cour

Attachment I

Notification Letters

Moody AND ASSOCIATES, INC.

Groundwater and Environmental Professionals Since 1891

March 3, 2023

Beaver County Planning Commission
Beaver County Courthouse
810 Third Street
Beaver, PA 15009

Re: Notification of Water Withdrawal from Big Sewickley Creek
PennEnergy Resources, LLC
Economy Borough, Beaver County, PA

FedEx Tracking Number: 771463773631

To Whom It May Concern:

Notice is hereby given that PennEnergy Resources, LLC intends to submit an amendment to their Water Management Plan to initiate a water withdrawal from Big Sewickley Creek. The withdrawal point is located on private property at 40.6094 N; 80.1804 W, in Economy Borough, Beaver County, Pennsylvania. The purpose of this withdrawal is for the development of shale gas and/or oil.

This notification is being submitted in response to the Pennsylvania Department of Environmental Protection (PADEP) Bureau of Oil and Gas Management requirements of the Water Management Plan for unconventional shale gas well development.

This letter is for notification purposes only. No action is required on your part.

Sincerely,

Paul Martin
Project Manager
Moody and Associates, Inc.
(814) 724-4970

March 06, 2023

Dear Customer,

The following is the proof-of-delivery for tracking number: 771463773631

Delivery Information:

Status:	Delivered	**Delivered To:**	Receptionist/Front Desk
Signed for by:	S.JAMERY	**Delivery Location:**	810 3RD ST
Service type:	FedEx Priority Overnight		
Special Handling:	Deliver Weekday; Direct Signature Required		BEAVER, PA, 15009
		Delivery date:	Mar 6, 2023 08:57

Shipping Information:

Tracking number:	771463773631	**Ship Date:**	Mar 3, 2023
		Weight:	0.5 LB/0.23 KG

Recipient:
Beaver County Planning Commission, Beaver County Courthouse
810 Third Street
BEAVER, PA, US, 15009

Shipper:
Moody and Associates, Inc.,
11548 Cotton Road
Meadville, PA, US, 16335

Reference 12-115-CO

Thank you for choosing FedEx

Moody AND ASSOCIATES, INC.

Groundwater and Environmental Professionals Since 1891

February 17, 2023

Economy Borough Supervisors
2856 Conway Wallrose Road
Baden, PA 15005

Re: Notification of Water Withdrawal from Big Sewickley Creek
PennEnergy Resources, LLC
Economy Borough, Beaver County, PA

Certified Mail Number: 9414 8169 0251 7249 4900 76

To Whom It May Concern:

Notice is hereby given that PennEnergy Resources, LLC intends to submit an amendment to their Water Management Plan to initiate a water withdrawal from Big Sewickley Creek. The withdrawal point is located on private property at 40.6094 N; 80.1804 W, in Economy Borough, Beaver County, Pennsylvania. The purpose of this withdrawal is for the development of shale gas and/or oil.

This notification is being submitted in response to the Pennsylvania Department of Environmental Protection (PADEP) Bureau of Oil and Gas Management requirements of the Water Management Plan for unconventional shale gas well development.

This letter is for notification purposes only. No action is required on your part.

Sincerely,

Paul Martin
Project Manager
Moody and Associates, Inc.
(814) 724-4970

March 2, 2023

Dear PAUL MARTIN:

The following is in response to your request for proof of delivery on your item with the tracking number: **9414 8169 0251 7249 4900 76**.

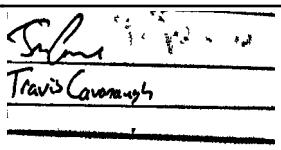
Item Details

Status:	Delivered, Front Desk/Reception/Mail Room
Status Date / Time:	February 21, 2023, 11:37 am
Location:	BADEN, PA 15005
Postal Product:	First-Class Mail®
Extra Services:	Certified Mail™
	Return Receipt Electronic
Recipient Name:	ECONOMY BOROUGH SUPERVISORS

Shipment Details

Weight:	1.0oz

Recipient Signature

Signature of Recipient:	
Address of Recipient:	

Note: Scanned image may reflect a different destination address due to Intended Recipient's delivery instructions on file.

Thank you for selecting the United States Postal Service® for your mailing needs. If you require additional assistance, please contact your local Post Office™ or a Postal representative at 1-800-222-1811.

Sincerely,
United States Postal Service®
475 L'Enfant Plaza SW
Washington, D.C. 20260-0004

Attachment J

Withdrawal Impacts Analysis

Big Sewickley Creek – Withdrawal Impact Analysis

The following narrative details anticipated impacts and methods proposed to avoid or mitigate impacts associated with the proposed water withdrawal from Big Sewickley Creek:

a. PennEnergy Resources, LLC (PennEnergy) has selected this intake site to minimize any aquatic species, wetland, and habitat impacts, as well as to minimize transportation distance. The intake pump and piping will be designed to reduce impingement and entrainment potential by using a floating intake in sufficiently deep water with an intake screen spacing of 3/16 inch or less and entrance velocities of less than 0.5 foot per second. The stream bed bottom at the location of the proposed withdrawal was surveyed and is represented at the location of each intake structure on the cross-sections presented in ATTACHMENT D. Normal pool depth is represented on the cross-sections and is based on the water elevation (from the stream gage curve) at the average daily flow value of 21.6 cubic feet per second, from USGS StreamStats. The table presented in ATTACHMENT D reflects the water elevations associated with the required flow rates (i.e. 8.8 cfs and 13.1 cfs) for the full withdrawal rate to occur, along with the associated separation from strainer to stream bed. The cross-sections and table presented in ATTACHMENT D were reviewed by Pennsylvania Fish and Boat Commission (PFBC), which deemed the placement of the intake appropriate. PFBC deemed the minimum pool depth and separation between intakes and streambed adequate to prevent impingement and entrainment, as well as avoid any impacts to the streambed (PFBC correspondence is included in ATTACHMENT G). The intake will consist of a series of seven Megator Dolphin Strainers to achieve the desired withdrawal rate while maintaining entrance velocity of not more than 0.5 foot per second. The intake will float on the surface and will only collect water from the top of the water column (within approximately the top 10 inches). The intake specification are attached to this document along with the entrance velocity calculations and/or documentation. Refer to the attached specifications for the 6-inch strainer for sizing details (line diameter: 6 in.; total intake height: 19 in. [10 inches observed below surface during use]; intake length: 21 $^{7}/_{8}$ in.; intake diameter: 15 3/4 in.)

b. A Wetland and Stream Delineation Report was prepared by Civil & Environmental Consultants, Inc. (CEC), and is included as Attachment K. CEC delineated approximately 200 feet upstream and downstream of the proposed withdrawal point. The report states that no wetlands were identified within the delineation boundary. Based on their findings, the withdrawal will not have a material impact on wetlands.

c. The PNDI review revealed the probable presence of the Southern Redbelly Dace fish species. While the species is not threatened or endangered in the US as a whole, it has a limited presence in Pennsylvania, and is therefore considered locally threatened. Information gathered from animaldiversity.org (https://animaldiversity.org/accounts/Chrosomus_erythrogaster) indicate the Southern Redbelly Dace generally reside in small, cool streams with a moderate to slow current and having sand, gravel, or mud substrates and vegetated/overhanging banks.

They generally feed on algae, small invertebrates, and detritus on the bottom of streams. They also breed on the bottom of streams from May to June, resulting in between 200 and 6,000 offspring.

In accordance with guidance provided by the Pennsylvania Fish and Boat Commission (PAFBC) in their Species Impact Review (SIR) #56633 (included with Attachment F) the Tennant method, also known as the Montana method, is proposed to determine the appropriate protective flow regimens during withdrawals. A copy of a report describing the method by Donald Tennant, detailing its nearly universal applicability, is included in Attachment F. The method describes separate minimum flow regimens for October through March, and April through September. It states that 10% of average flow is the minimum required for short-term fish survival, whereas 30% and 50% of average flow during the previously mentioned monthly spans, respectively, is considered an "excellent" instream flow regimen for fish, wildlife, recreation, and related environmental resources.

Based on the ADF of 21.6 cubic feet per second (cfs) provided by the United States Geologic Survey StreamStats online application and the flow regimen recommendations applied from the Tennant method, the following passby flows are proposed, along with the volume required for the full requested withdrawal of 1.5 million gallons per day:

Table: Recommended base flow regimen based on Tennant's "Excellent" flow description and Average Daily Flow from USGS StreamStats

			30% ADF (Oct-Mar)		50% ADF (Apr-Sept)	
	BSC Average Daily Flow	Proposed Withdrawal Amount (% of ADF)	Minimum Passby – Stop Withdrawal	Passby Required for Full Withdrawal	Minimum Passby – Stop Withdrawal	Passby Required for Full Withdrawal
Cubic Feet per Second	21.6	2.3 (10.6%)	6.5	8.8	10.8	13.1
Gallons per Day	13,960,408	1,500,000 (10.6%)	4,188,123	5,687,574	6,980,204	8,479,655
Stage Measured at Onsite Staff Gage (Upstream /Downstream) (ft)	1.71/1.19		1.34/0.96	1.43/1.02	1.49/1.05	1.55/1.09

The less restrictive of the two passby percentages (30%) is adequately protective of both instream flows and low flows. Tennant lists 30% ADF as representative of "excellent" flow conditions and states "This is a base flow recommended to sustain good survival habitat for

most aquatic life forms.". During the late May through early June spawning season of the Southern Redbelly Dace, an enhanced passby of 50% ADF is proposed to offer additional habitat protection for the species. The PAFBC has concurred with this assessment of flow protection and stated in SIR #56633 that "This pass by flow recommendation is deemed to be protective of instream habitat minimizing decreases in wetted width.". During average flow conditions, 89.4% of ADF will remain in the creek. Considering that seasonal passby restrictions of 30% ADF and 50% ADF are protective of low flows as described above, and considering that those base flow recommendations are deemed to sustain survival habitat and minimize decreases in wetted width, allowing 89.4% of ADF to remain in the creek will not materially impact aquatic life and, with the inclusion of passby requirements will be protective instream flows, satisfying 25 Pa. Code §78a.69 (b)(1).

In addition to the passby restrictions described above, in order to minimize impacts to the feeding and breeding behaviors of the Southern Redbelly Dace PennEnergy will utilize an intake screen suspended above bottom. The screen will extract water from the top of the water column, above the bottom of the stream, which is the preferred location for feeding and breeding of the Southern Redbelly Dace. The intake screen will be sized appropriately to maintain a cross-screen velocity of no more than 0.5 foot per second, in accordance PFBC policy to prevent impingement and entrainment of aquatic species as discussed in Section (a) above.

d. All active Water Pollution Control Facilities (WPCFs) found on eMapPA (attached below) were reviewed and found to be stormwater discharge points. A list of active WPCFs found on eMapPA in proximity to Big Sewickley Creek is attached below. While Libertas Copper, LLC, Hussey Copper site is listed in eMapPA as "Industrial Waste" discharge, the permit (attached below) lists all Hussey Copper outfalls associated with Big Sewickley Creek as "Stormwater Runoff". There is an apparent municipal sewage plant approximately 1.25 miles downstream of the proposed withdrawal point that is not included on eMapPA (Economy Borough Wastewater Treatment Plant), but the NPDES permit Fact Sheet for the plant (attached below) was located and reviewed. The permit documents include modeling ("Toxic Screening Analysis, Water Quality Pollutants of Concern Version 2.7") that was completed by PADEP to determine maximum permitted effluent limits. The model used the Q 7-10 (7 consecutive day low flow with a 10-year statistical recurrence, i.e., essentially drought conditions) as the stream flow. Further research and discussion with PADEP showed that all the permitted effluent limits for NPDES permits are modeled similarly using the Q 7-10 of the stream at the discharge point. In the case of Economy Borough wastewater treatment plant, the Q 7-10 flow was 0.153 cfs. Due to the proposed passby flows of 30% and 50% of ADF (1.33 cfs and 1.46 cfs, respectively) the streamflow during withdrawals will not approach the low flow conditions the NPDES effluent limits were designed to accommodate, and assimilative capacity of the creek will not be impaired. Additionally, any future discharges to Big Sewickley Creek will be subject to similar modeling during the permitting process which would ensure assimilative capacity of the creek is not impaired.

e. Big Sewickley Creek is not listed as water quality impaired. Therefore, it is not expected that withdrawal operations will materially exacerbate the water quality conditions of the stream due to the passby flow restriction.

f. Through review of the PADEP's eMaps website (see attached figure), the operator is unaware of any significant downstream thermal discharges downstream of the proposed withdrawal location. Therefore, it is not expected that the withdrawal operations will diminish the assimilative capacity of the creek.

g. The proposed withdrawal is not classified as a special protection (HQ) creek. If the flow rate in the creek approaches the approved passby flow rate, the operator will scale back the withdrawal rate and increase passby flow monitoring frequency in order to preserve downstream water quality.

h. Through review of the PADEP's eMaps website (see attached figure), the operator is unaware of any relatively close, significant potable water supply sources downstream of the withdrawal location. Therefore, it is not expected that withdrawal operations will reduce the capacity of the creek to any supply waters. If the flow rate in the creek approaches the approved passby flow rate, the operator will scale back the withdrawal rate and increase passby flow monitoring frequency in order to preserve downstream water quality and to allow sufficient flow for downstream users.

i. Through review of the PADEP's eMaps website (see attached figure), the operator is aware of one surface water withdrawal within the vicinity of the proposed withdrawal. The proposed withdrawal, however, is not anticipated to impair the amount of water available to meet demands. The operator will scale back the withdrawal rate and increase passby flow monitoring frequency if the flow rate approaches the approved passby flow in order to allow sufficient flow for downstream users.

j. The minimum passby flow will be maintained while withdrawals are performed. The staff gage at the withdrawal site will be referenced on an interim basis every time a withdrawal is desired to confirm the upstream flow rate and the availability of water for withdrawal. Withdrawals will be scaled back or ceased, as described in the Water Source Use & Monitoring Plan, included as Attachment A. The operator expects withdrawals will be made intermittently, not continuously, depending on current operations.

MEGATOR
INNOVATIVE PUMPS & SYSTEMS SINCE 1946

Dolphin Strainers

Floating Suction Strainers

Megator Dolphin Floating Suction Strainers draw from just below the surface, avoiding sand, mud and floating matter. They do not get buried when grounded in shallow water. Made entirely of tough, corrosion resistant plastics and stainless steel.

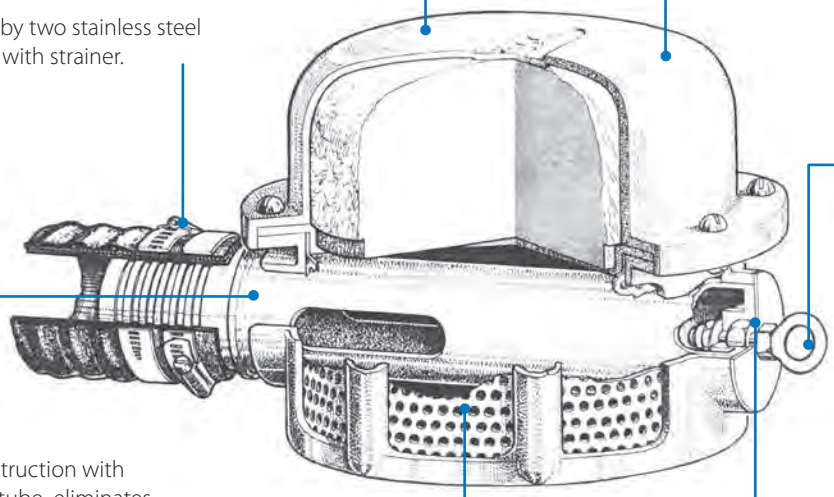
- > Reduce wear of pumps
- > Prevent pump damage
- > Prevent stoppages
- > Lessen cavitation risk
- > Save their cost many times over
- > Always float upright
- > Will not lose buoyancy
- > Tough, shock-proof
- > Corrosion proof

Used for dewatering mines, quarries, excavations and sumps. For water supplies from rivers, lakes, ponds and fire appliances. They are also used for oil storage and other installations required to draw from near the surface.

Float chamber contains moulding of polyurethane foam, providing millions of separate air cells. No loss of buoyancy if accidentally pierced.

Rounded shape gives maximum strength and resistance to rough handling.

Hose secured by two stainless steel clips supplied with strainer.



Eye provided for mooring, or for attaching extra weight, for choppy or fast-flowing water.

Patented construction with freely turning tube eliminates twisting effect of hose and ensures correct attitude of strainer at all times.

Detachable tube for access to interior without disconnecting hose.

Detachable strainer plates in sides only. Strongly ribbed bottom without holes prevents any tendency for strainer to be sucked down into mud if stranded in shallow water.

The strainer holes are 3/16" (4.75mm) diameter, the total area of the holes being between 3 and 4 times the cross- sectional area of the hose. The 6" size has a perforated body which along with the tube is constructed entirely of 18/8 stainless steel. Other sizes have replaceable strainer screens made from Darvic black P.V.C. Standard strainers are suitable for operating temperatures up to 194ºF (90ºC), but for temperatures above 150ºF (65ºC) stainless steel strainer plates are available as an optional extra.

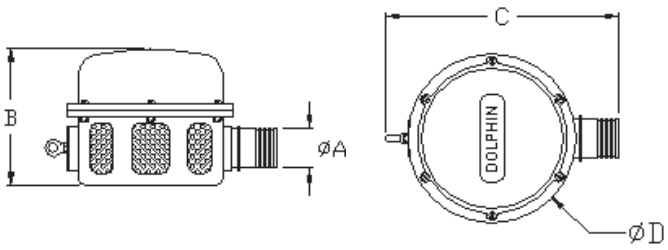


Table of Sizes

Size	A	B	C	D	Max capacity lt/min
1 1/2"	1 1/2" (38mm)	6 3/8" (162mm)	9 7/8" (250mm)	5 3/4" (146mm)	140
2"	2" (51mm)	6 7/8" (175mm)	12" (305mm)	7 3/16" (183mm)	280
3"	3" (76mm)	8 1/2" (216mm)	15 1/2" (393mm)	10" (254mm)	560
4"	4" (102mm)	10 1/2" (267mm)	17 1/2" (444mm)	12" (305mm)	1150
6"	6" (152mm)	19" (482mm)	21 7/8" (556mm)	15 3/4" (400mm)	3000

North & South America • 1721 Main Street • Pittsburgh, PA 15215 • USA • Tel: 412.963.9200, 1.800.245.6211 • info@megator.com • **megator.com**

Europe • Hendon • Sunderland, SR1 2NQ • United Kingdom • Tel: +44 (0) 191 5675488 • info@megator.co.uk • **megator.co.uk**

Australasia • 6-12 Burleigh Street • Toronto 2283 - N.S.W. • Australia • Tel: +61 2 49599400 • sales@megator.com.au • **megator.com.au**

Big Sewickley Creek - Entrance Velocity Calculation: 6-in. Megator Dolphin Strainer

Hose Diameter:	0.5	ft	hose radius	0.25	ft
Max Capacity:	792	gpm			
Hose X-Sect Area:	pi (r2) =	0.196349375	ft2		
Effective screen length:		43.75	inches		
Screen width:		7	inches		
Hole width:		0.1875	inch		
Hole spacing:		0.118	inch		
Holes across length:		143			
Rows of holes:		25.5			
Total holes:		3646.5			
Area of hole:		0.02761	in2		
Total open area:		100.679865	in2		
Total open area:		0.6992361	ft2 (3.56 x area of hose x-sect area)		

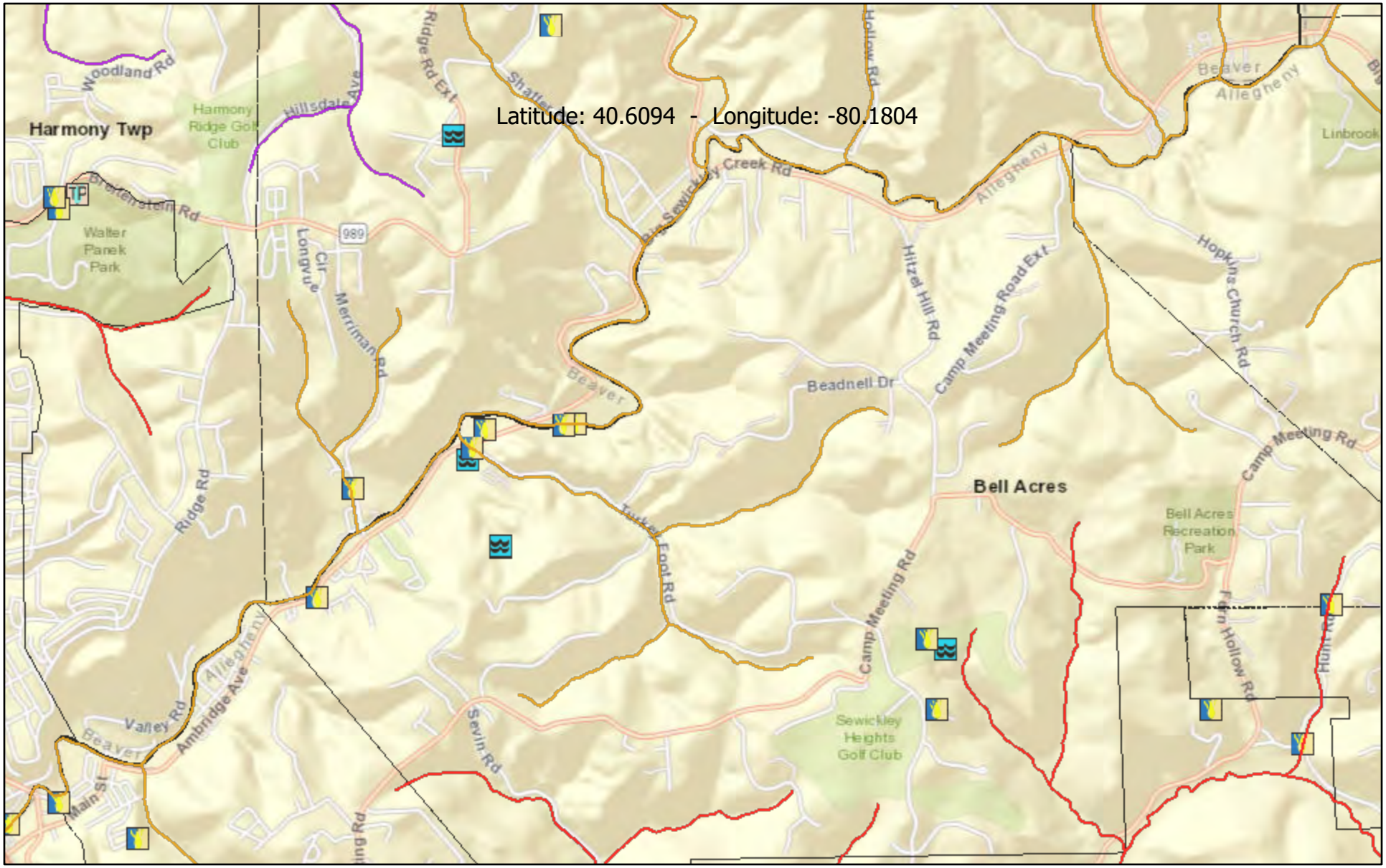
Total intake is 1040 gpm. If using 7 intake screens, each is reduced to 148.57 gpm, entrance velocity reduced to 0.47 ft/sec

Intake:	148.57	gpm max (w/ 7 strainers)	or	0.331016	cfs

Entrance Velocity=	0.331016 cfs/ 0.6992361 ft2=	0.473396894	ft/s

eMapPA

Water Pollution Control Facilities



January 26, 2023

1:36,112

0 0.23 0.45 0.9 mi

0 0.38 0.75 1.5 km

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand),

Client_Name	Site_Name	Primary_Facility_Name	Primary_Facility_Type	Primary_Facility_Kind	Other_Facility_ID	Sub_Facility_Type	Site_Status
BELL ACRES BORO ALLEGHENY CNTY	BELL ACRES BORO	BELL ACRES BORO STORM SEW SYS MS4	WATER POLLUTION CONTROL FACILITY	STORMWATER-MUNICIPAL	PAG136407	DISCHARGE POINT	ACTIVE
ECONOMY BORO BEAVER CNTY	ECONOMY BORO SEW SYS	ECONOMY BORO STORM SEW SYS MS4	WATER POLLUTION CONTROL FACILITY	STORMWATER-MUNICIPAL	PAG136266	DISCHARGE POINT	ACTIVE
WINE CONCRETE PROD INC	WINE CONCRETE PROD	WINE CONCRETE PROD INC	WATER POLLUTION CONTROL FACILITY	STORMWATER-INDUSTRIAL	PAR706122	DISCHARGE POINT	ACTIVE
HANSON AGGREGATES PA LLC	SEWICKLEY CRK ASPHALT PLT	SEWICKLEY CRK ASPHALT PLT	WATER POLLUTION CONTROL FACILITY	STORMWATER-INDUSTRIAL	PAR706121	DISCHARGE POINT	ACTIVE
HANSON AGGREGATES PA LLC	SEWICKLEY CRK ASPHALT PLT	SEWICKLEY CRK ASPHALT PLT	WATER POLLUTION CONTROL FACILITY	STORMWATER-INDUSTRIAL	PAR706121	DISCHARGE POINT	ACTIVE
LIBERTAS COPPER LLC	HUSSEY COPPER	LEETSDALE PLT	WATER POLLUTION CONTROL FACILITY	INDUSTRIAL WASTE	PA0000566	DISCHARGE POINT	ACTIVE
WORLDCLASS PROC CORP	WORLDCLASS PROC AMBRIDGE PLT	AMBRIDGE PLT	WATER POLLUTION CONTROL FACILITY	STORMWATER-INDUSTRIAL	PAR206108	DISCHARGE POINT	ACTIVE
LIBERTAS COPPER LLC	HUSSEY COPPER	LEETSDALE PLT	WATER POLLUTION CONTROL FACILITY	INDUSTRIAL WASTE	PA0000566	DISCHARGE POINT	ACTIVE
LIBERTAS COPPER LLC	HUSSEY COPPER	LEETSDALE PLT	WATER POLLUTION CONTROL FACILITY	INDUSTRIAL WASTE	PA0000566	DISCHARGE POINT	ACTIVE
LIBERTAS COPPER LLC	HUSSEY COPPER	LEETSDALE PLT	WATER POLLUTION CONTROL FACILITY	INDUSTRIAL WASTE	PA0000566	DISCHARGE POINT	ACTIVE
LIBERTAS COPPER LLC	HUSSEY COPPER	LEETSDALE PLT	WATER POLLUTION CONTROL FACILITY	INDUSTRIAL WASTE	PA0000566	DISCHARGE POINT	ACTIVE
AMBRIDGE BORO BEAVER CNTY	AMBRIDGE BORO MUNI AUTH WATER SYS	AMBRIDGE BORO STORM SEW SYS MS4	WATER POLLUTION CONTROL FACILITY	STORMWATER-MUNICIPAL	PAG136172	DISCHARGE POINT	ACTIVE
LEET TWP ALLEGHENY CNTY	LEET TWP STORM SEW SYS	LEET TWP STORM SEW SYS	WATER POLLUTION CONTROL FACILITY	STORMWATER-MUNICIPAL	PAI136108	DISCHARGE POINT	ACTIVE
LIBERTAS COPPER LLC	HUSSEY COPPER	LEETSDALE PLT	WATER POLLUTION CONTROL FACILITY	INDUSTRIAL WASTE	PA0000566	DISCHARGE POINT	ACTIVE
LIBERTAS COPPER LLC	HUSSEY COPPER	LEETSDALE PLT	WATER POLLUTION CONTROL FACILITY	INDUSTRIAL WASTE	PA0000566	DISCHARGE POINT	ACTIVE

Libertas Copper, LLC

Hussey Copper Site

NPDES Permit

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF POINT AND NON-POINT SOURCE MANAGEMENT

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM DISCHARGE REQUIREMENTS FOR INDUSTRIAL WASTEWATER FACILITIES

NPDES PERMIT NO: PA0000566

In compliance with the provisions of the Clean Water Act, 33 U.S.C. Section 1251 *et seq.* ("the Act") and Pennsylvania's Clean Streams Law, as amended, 35 P.S. Section 691.1 *et seq.*,

Libertas Copper, LLC
100 Washington Street
Leetsdale, PA 15056-1000

is authorized to discharge from a facility known as **Libertas Copper, LLC**, (d.b.a. Hussey Copper) located in **Leetsdale Borough, Allegheny County**, to the **Ohio River** and **Big Sewickley Creek** in Watershed(s) **20-G** in accordance with effluent limitations, monitoring requirements and other conditions set forth in Parts A, B and C hereof.

THIS PERMIT SHALL BECOME EFFECTIVE ON NOVEMBER 1, 2016

THIS PERMIT SHALL EXPIRE AT MIDNIGHT ON OCTOBER 31, 2021

The authority granted by this permit is subject to the following further qualifications:

1. If there is a conflict between the application, its supporting documents and/or amendments and the terms and conditions of this permit, the terms and conditions shall apply.

2. Failure to comply with the terms, conditions or effluent limitations of this permit is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application. (40 CFR 122.41(a))

3. A complete application for renewal of this permit, or notice of intent to cease discharging by the expiration date, must be submitted to DEP at least 180 days prior to the above expiration date (unless permission has been granted by DEP for submission at a later date), using the appropriate NPDES permit application form. (40 CFR 122.41(b), 122.21(d)(2))

   In the event that a timely and complete application for renewal has been submitted and DEP is unable, through no fault of the permittee, to reissue the permit before the above expiration date, the terms and conditions of this permit, including submission of the Discharge Monitoring Reports (DMRs), will be automatically continued and will remain fully effective and enforceable against the discharger until DEP takes final action on the pending permit application. (25 Pa. Code §§ 92a.7 (b), (c))

4. This NPDES permit does not constitute authorization to construct or make modifications to wastewater treatment facilities necessary to meet the terms and conditions of this permit.

DATE PERMIT ISSUED OCTOBER 21, 2016 **ISSUED BY**

Christopher Kriley, P.E.
Environmental Program Manager
Southwest Regional Office

PART A - EFFLUENT LIMITATIONS, MONITORING, RECORDKEEPING AND REPORTING REQUIREMENTS

I. A. For Outfall 001 , **Latitude** 40º 34' 29.63" , **Longitude** -80º 13' 26.4" , **River Mile Index** 965.7 , **Stream Code** 32317

Receiving Waters: Ohio River

Type of Effluent: ELG regulated process wastewater; non-contact cooling water; and stormwater runoff

1. The permittee is authorized to discharge during the period from Permit Effective Date through Permit Expiration Date.

2. Based on the anticipated wastewater characteristics and flows described in the permit application and its supporting documents and/or amendments, the following effluent limitations and monitoring requirements apply (see also Additional Requirements and Footnotes).

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	1/week	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	9.0	XXX	1/week	Grab
Temperature (ºF)	XXX	XXX	XXX	XXX	XXX	110	1/week	I-S
Total Suspended Solids	XXX	XXX	XXX	30.0	60.0	XXX	1/week	Grab
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.5	1.0	XXX	2/month	Grab
Oil and Grease	XXX	XXX	XXX	15.0	30.0	XXX	2/month	Grab
Copper, Total	XXX	XXX	XXX	0.4	0.8	XXX	2/month	Grab

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s):

at Outfall 001

PART A - EFFLUENT LIMITATIONS, MONITORING, RECORDKEEPING AND REPORTING REQUIREMENTS

I. B. For Outfall 101 **, Latitude** --- **, Longitude** --- **, River Mile Index** 965.7 **, Stream Code** 32317

Receiving Waters: Ohio River

Type of Effluent: Treated process wastewater from direct chill casters, annealing furnaces, cleaning lines and hot rolling mill.

1. The permittee is authorized to discharge during the period from Permit Effective Date through Permit Expiration Date.

2. Based on the anticipated wastewater characteristics and flows described in the permit application and its supporting documents and/or amendments, the following effluent limitations and monitoring requirements apply (see also Additional Requirements and Footnotes).

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	1/day	Measured
pH (S.U.)	XXX	XXX	7.5	XXX	10.0	XXX	1/day	Grab
Oil and Grease	57	105	XXX	10.0	10.0	XXX	1/week	Grab
Total Suspended Solids	90	189	XXX	12.0	15.0	30*	1/week	24-Hr Composite
Chromium, Total	0.229	0.561	XXX	0.15	0.37	0.463*	1/week	24-Hr Composite
Copper, Total	1.59	3.034	XXX	0.61	1.28	1.6*	1/week	24-Hr Composite
Lead, Total	0.398	0.669	XXX	0.13	0.28	0.35*	1/week	24-Hr Composite
Nickel, Total	1.40	2.12	XXX	0.37	0.55	0.69*	1/week	24-Hr Composite
Zinc, Total	1.02	2.50	XXX	0.42	1.02	1.28*	1/week	24-Hr Composite

***** Instantaneous maximum limitations for IMP 101 are imposed to allow for a grab sample to be collected by the appropriate regulatory agency to determine compliance. The permittee is not required to monitor the instantaneous maximum limitations. However, if grab samples are collected by the permittee, the results must be reported.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s):

At Outfall 101; the treatment system discharge pipe.

PART A - EFFLUENT LIMITATIONS, MONITORING, RECORDKEEPING AND REPORTING REQUIREMENTS

I. C. For Outfall 002 **, Latitude** 40º 34' 17.4" **, Longitude** -80º 13' 16.7" **, River Mile Index** 966 **, Stream Code** 32317

Receiving Waters: Ohio River

Type of Effluent: Stormwater runoff from the south end of the facility

1. The permittee is authorized to discharge during the period from Permit Effective Date through Permit Expiration Date.

2. Based on the anticipated wastewater characteristics and flows described in the permit application and its supporting documents and/or amendments, the following effluent limitations and monitoring requirements apply (see also Additional Requirements and Footnotes).

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
pH (S.U.)	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Chemical Oxygen Demand	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Total Suspended Solids	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Oil and Grease	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Aluminum, Total	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Copper, Total	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Iron, Total	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Lead, Total	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Nickel, Total	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Zinc, Total	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s):

At Outfall 002

PART A - EFFLUENT LIMITATIONS, MONITORING, RECORDKEEPING AND REPORTING REQUIREMENTS

I. D. For Outfall 003 , **Latitude** 40º 34' 28.20" , **Longitude** -80º 13' 17.80" , **River Mile Index** 0.25 , **Stream Code** 32317

Receiving Waters: Big Sewickley Creek

Type of Effluent: Stormwater runoff from employee parking lot; mill scale loading area roll-off boxes.

1. The permittee is authorized to discharge during the period from Permit Effective Date through Permit Expiration Date.

2. Based on the anticipated wastewater characteristics and flows described in the permit application and its supporting documents and/or amendments, the following effluent limitations and monitoring requirements apply (see also Additional Requirements and Footnotes).

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
pH (S.U.)	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Chemical Oxygen Demand	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Total Suspended Solids	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Oil and Grease	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Aluminum, Total	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Copper, Total	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Iron, Total	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Lead, Total	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Nickel, Total	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Zinc, Total	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s):

At the Outfall 003 catch basin.

PART A - EFFLUENT LIMITATIONS, MONITORING, RECORDKEEPING AND REPORTING REQUIREMENTS

I. E. For Outfall 004 , **Latitude** 40º 34' 26.70" , **Longitude** -80º 13' 15.70" , **River Mile Index** 0.25 , **Stream Code** 36596

Receiving Waters: Big Sewickley Creek

Type of Effluent: Stormwater runoff from employee parking lot; mill scale loading area roll-off boxes.

1. The permittee is authorized to discharge during the period from Permit Effective Date through Permit Expiration Date.

2. Based on the anticipated wastewater characteristics and flows described in the permit application and its supporting documents and/or amendments, the following effluent limitations and monitoring requirements apply (see also Additional Requirements and Footnotes).

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
pH (S.U.)	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Chemical Oxygen Demand	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Total Suspended Solids	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Oil and Grease	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Aluminum, Total	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Copper, Total	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Iron, Total	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Lead, Total	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Nickel, Total	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Zinc, Total	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s):

At the Outfall 004 catch basin.

PART A - EFFLUENT LIMITATIONS, MONITORING, RECORDKEEPING AND REPORTING REQUIREMENTS

I. F. For Outfall 005 , **Latitude** 40º 34' 25.5" , **Longitude** -80º 13' 14" , **River Mile Index** 0.25 , **Stream Code** 36596

Receiving Waters: Big Sewickley Creek

Type of Effluent: Stormwater runoff from employee parking lot; mill scale loading area roll-off boxes.

1. The permittee is authorized to discharge during the period from Permit Effective Date through Permit Expiration Date.

2. Based on the anticipated wastewater characteristics and flows described in the permit application and its supporting documents and/or amendments, the following effluent limitations and monitoring requirements apply (see also Additional Requirements and Footnotes).

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
pH (S.U.)	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Chemical Oxygen Demand	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Total Suspended Solids	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Oil and Grease	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Aluminum, Total	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Copper, Total	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Iron, Total	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Lead, Total	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Nickel, Total	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab
Zinc, Total	XXX	XXX	XXX	XXX	Report	XXX	1/month	Grab

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s):

At the Outfall 005 catch basin.

PART A - EFFLUENT LIMITATIONS, MONITORING, RECORDKEEPING AND REPORTING REQUIREMENTS (Continued)

Additional Requirements

The permittee may not discharge:

1. Floating solids, scum, sheen or substances that result in observed deposits in the receiving water. (25 Pa Code § 92a.41(c))

2. Oil and grease in amounts that cause a film or sheen upon or discoloration of the waters of this Commonwealth or adjoining shoreline, or that exceed 15 mg/l as a daily average or 30 mg/l at any time (or lesser amounts if specified in this permit). (25 Pa. Code § 92a.47(a)(7), § 95.2(2))

3. Substances in concentration or amounts sufficient to be inimical or harmful to the water uses to be protected or to human, animal, plant or aquatic life. (25 Pa Code § 93.6(a))

4. Foam or substances that produce an observed change in the color, taste, odor or turbidity of the receiving water, unless those conditions are otherwise controlled through effluent limitations or other requirements in this permit. For the purpose of determining compliance with this condition, DEP will compare conditions in the receiving water upstream of the discharge to conditions in the receiving water approximately 100 feet downstream of the discharge to determine if there is an observable change in the receiving water. (25 Pa Code § 92a.41(c))

Footnotes

(1) When sampling to determine compliance with mass effluent limitations, the discharge flow at the time of sampling must be measured and recorded.

(2) This is the minimum number of sampling events required. Permittees are encouraged, and it may be advantageous in demonstrating compliance, to perform more than the minimum number of sampling events.

Supplemental Information

The effluent limitations for Outfall 001 were determined using an effluent discharge rate of 1.03 MGD.

The effluent limitations for IMP 101 were determined using an effluent discharge rate of 0.293 MGD.

II. DEFINITIONS

At Outfall (XXX) means a sampling location in outfall line XXX below the last point at which wastes are added to outfall line (XXX), or where otherwise specified.

Average refers to the use of an arithmetic mean, unless otherwise specified in this permit. (40 CFR 122.41(l)(4)(iii))

Best Management Practices (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures and other management practices to prevent or reduce the pollutant loading to surface waters of the Commonwealth. The term also includes treatment requirements, operating procedures and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. The term includes activities, facilities, measures, planning or procedures used to minimize accelerated erosion and sedimentation and manage stormwater to protect, maintain, reclaim, and restore the quality of waters and the existing and designated uses of waters within this Commonwealth before, during and after earth disturbance activities. (25 Pa. Code § 92a.2)

Bypass means the intentional diversion of waste streams from any portion of a treatment facility. (40 CFR 122.41(m)(1)(i))

Calendar Week is defined as the seven consecutive days from Sunday through Saturday, unless the permittee has been given permission by DEP to provide weekly data as Monday through Friday based on showing excellent performance of the facility and a history of compliance. In cases when the week falls in two separate months, the month with the most days in that week shall be the month for reporting.

Clean Water Act means the Federal Water Pollution Control Act, as amended. (33 U.S.C.A. §§ 1251 to 1387).

Chemical Additive means a chemical product (including products of disassociation and degradation, collectively “products”) introduced into a waste stream that is used for cleaning, disinfecting, or maintenance and which may be detected in effluent discharged to waters of the Commonwealth. The term generally excludes chemicals used for neutralization of waste streams, the production of goods, and treatment of wastewater.

Composite Sample (for all except GC/MS volatile organic analysis) means a combination of individual samples (at least eight for a 24-hour period or four for an 8-hour period) of at least 100 milliliters (mL) each obtained at spaced time intervals during the compositing period. The composite must be flow-proportional; either the volume of each individual sample is proportional to discharge flow rates, or the sampling interval is proportional to the flow rates over the time period used to produce the composite. (EPA Form 2C)

Composite Sample (for GC/MS volatile organic analysis) consists of at least four aliquots or grab samples collected during the sampling event (not necessarily flow proportioned). A separate analysis should be performed for each sample and the results should be averaged.

Daily Average Temperature means the average of all temperature measurements made, or the mean value plot of the record of a continuous automated temperature recording instrument, either during a calendar day or during the operating day if flows are of a shorter duration.

Daily Discharge means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the "daily discharge" is calculated as the average measurement of the pollutant over the day. (25 Pa. Code § 92a.2, 40 CFR 122.2)

Daily Maximum Discharge Limitation means the highest allowable "daily discharge."

Discharge Monitoring Report (DMR) means the DEP or EPA supplied form(s) for the reporting of self-monitoring results by the permittee. (25 Pa. Code § 92a.2, 40 CFR 122.2)

Estimated Flow means any method of liquid volume measurement based on a technical evaluation of the sources contributing to the discharge including, but not limited to, pump capabilities, water meters and batch discharge volumes.

Geometric Mean means the average of a set of n sample results given by the nth root of their product.

Grab Sample means an individual sample of at least 100 mL collected at a randomly selected time over a period not to exceed 15 minutes. (EPA Form 2C)

Hazardous Substance means any substance designated under 40 CFR Part 116 pursuant to Section 311 of the Clean Water Act. (40 CFR 122.2)

Hauled-In Wastes means any waste that is introduced into a treatment facility through any method other than a direct connection to the wastewater collection system. The term includes wastes transported to and disposed of within the treatment facility or other entry points within the collection system.

Immersion Stabilization (i-s) means a calibrated device is immersed in the wastewater until the reading is stabilized.

Instantaneous Maximum Effluent Limitation means the highest allowable discharge of a concentration or mass of a substance at any one time as measured by a grab sample. (25 Pa. Code § 92a.2)

Measured Flow means any method of liquid volume measurement, the accuracy of which has been previously demonstrated in engineering practice, or for which a relationship to absolute volume has been obtained.

Monthly Average Discharge Limitation means the highest allowable average of "daily discharges" over a calendar month, calculated as the sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharges" measured during that month. (25 Pa. Code § 92a.2)

Municipal Waste means garbage, refuse, industrial lunchroom or office waste and other material, including solid, liquid, semisolid or contained gaseous material resulting from operation of residential, municipal, commercial or institutional establishments and from community activities; and sludge not meeting the definition of residual or hazardous waste under this section from a municipal, commercial or institutional water supply treatment plant, waste water treatment plant or air pollution control facility. (25 Pa. Code § 271.1)

Non-contact Cooling Water means water used to reduce temperature which does not come in direct contact with any raw material, intermediate product, waste product (other than heat), or finished product.

Residual Waste means garbage, refuse, other discarded material or other waste, including solid, liquid, semisolid or contained gaseous materials resulting from industrial, mining and agricultural operations and sludge from an industrial, mining or agricultural water supply treatment facility, wastewater treatment facility or air pollution control facility, if it is not hazardous. The term does not include coal refuse as defined in the Coal Refuse Disposal Control Act. The term does not include treatment sludges from coal mine drainage treatment plants, disposal of which is being carried on under and in compliance with a valid permit issued under the Clean Streams Law. (25 Pa Code § 287.1)

Severe Property Damage means substantial physical damage to property, damage to the treatment facilities that causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production. (40 CFR 122.41(m)(1)(ii))

Stormwater means the runoff from precipitation, snow melt runoff, and surface runoff and drainage. (25 Pa. Code § 92a.2)

Stormwater Associated With Industrial Activity means the discharge from any conveyance that is used for collecting and conveying stormwater and that is directly related to manufacturing, processing, or raw materials storage areas at an industrial plant, and as defined at 40 CFR 122.26(b)(14) (i) - (ix) & (xi) and 25 Pa. Code § 92a.2.

Total Dissolved Solids means the total dissolved (filterable) solids as determined by use of the method specified in 40 CFR Part 136.

Toxic Pollutant means those pollutants, or combinations of pollutants, including disease-causing agents, which after discharge and upon exposure, ingestion, inhalation or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains may, on the basis of information available to DEP cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions, including malfunctions in reproduction, or physical deformations in these organisms or their offspring. (25 Pa. Code § 92a.2)

III. SELF-MONITORING, REPORTING AND RECORDKEEPING

A. Representative Sampling

1. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity (40 CFR 122.41(j)(1)). Representative sampling includes the collection of samples, where possible, during periods of adverse weather, changes in treatment plant performance and changes in treatment plant loading. If possible, effluent samples must be collected where the effluent is well mixed near the center of the discharge conveyance and at the approximate mid-depth point, where the turbulence is at a maximum and the settlement of solids is minimized. (40 CFR 122.48, 25 Pa. Code § 92a.61)

2. Records Retention (40 CFR 122.41(j)(2))

   Except for records of monitoring information required by this permit related to the permittee's sludge use and disposal activities which shall be retained for a period of at least 5 years, all records of monitoring activities and results (including all original strip chart recordings for continuous monitoring instrumentation and calibration and maintenance records), copies of all reports required by this permit, and records of all data used to complete the application for this permit shall be retained by the permittee for 3 years from the date of the sample measurement, report or application, unless a longer retention period is required by the permit. The 3-year period shall be extended as requested by DEP or the EPA Regional Administrator.

3. Recording of Results (40 CFR 122.41(j)(3))

   For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

   a. The exact place, date and time of sampling or measurements.
   b. The person(s) who performed the sampling or measurements.
   c. The date(s) the analyses were performed.
   d. The person(s) who performed the analyses.
   e. The analytical techniques or methods used; and the associated detection level.
   f. The results of such analyses.

4. Test Procedures

   a. Facilities that test or analyze environmental samples used to demonstrate compliance with this permit shall be in compliance with laboratory accreditation requirements of Act 90 of 2002 (27 Pa. C.S. §§ 4101-4113) and 25 Pa. Code Chapter 252, relating to environmental laboratory accreditation.

   b. Test procedures (methods) for the analysis of pollutants or pollutant parameters shall be those approved under 40 CFR Part 136 or required under 40 CFR Chapter I, Subchapters N or O, unless the method is specified in this permit or has been otherwise approved in writing by DEP. (40 CFR 122.41(j)(4), 122.44(i)(1)(iv))

   c. Test procedures (methods) for the analysis of pollutants or pollutant parameters shall be sufficiently sensitive. A method is sufficiently sensitive when 1) the method minimum level is at or below the level of the effluent limit established in the permit for the measured pollutant or pollutant parameter; or 2) the method has the lowest minimum level of the analytical methods approved under 40 CFR Part 136 or required under 40 CFR Chapter I, Subchapters N or O, for the measured pollutant or pollutant parameter; or 3) the method is specified in this permit or has been otherwise approved in writing by DEP for the measured pollutant or pollutant parameter. Permittees have the option of providing matrix or sample-specific minimum levels rather than the published levels. (40 CFR 122.44(i)(1)(iv))

5. Quality/Assurance/Control

In an effort to assure accurate self-monitoring analyses results:

a. The permittee, or its designated laboratory, shall participate in the periodic scheduled quality assurance inspections conducted by DEP and EPA. (40 CFR 122.41(e), 122.41(i)(3))

b. The permittee, or its designated laboratory, shall develop and implement a program to assure the quality and accurateness of the analyses performed to satisfy the requirements of this permit, in accordance with 40 CFR Part 136. (40 CFR 122.41(j)(4))

B. Reporting of Monitoring Results

1. The permittee shall effectively monitor the operation and efficiency of all wastewater treatment and control facilities, and the quantity and quality of the discharge(s) as specified in this permit. (25 Pa. Code §§ 92a.3(c), 92a.41(a), 92a.44, 92a.61(i) and 40 CFR §§ 122.41(e), 122.44(i)(1))

2. The permittee shall use DEP's electronic Discharge Monitoring Report (eDMR) system to report the results of compliance monitoring under this permit (see www.dep.pa.gov/edmr). Permittees that are not using the eDMR system as of the effective date of this permit shall submit the necessary registration and trading partner agreement forms to DEP's Bureau of Clean Water (BCW) within 30 days of the effective date of this permit and begin using the eDMR system when notified by DEP BCW to do so. (25 Pa. Code §§ 92a.3(c), 92a.41(a), 92a.61(g) and 40 CFR § 122.41(l)(4))

3. Submission of a physical (paper) copy of a Discharge Monitoring Report (DMR) is acceptable under the following circumstances:

a. For a permittee that is not yet using the eDMR system, the permittee shall submit a physical copy of a DMR to the DEP regional office that issued the permit during the interim period between the submission of registration and trading partner agreement forms to DEP and DEP's notification to begin using the eDMR system.

b. For any permittee, as a contingency a physical DMR may be mailed to the DEP regional office that issued the permit if there are technological malfunction(s) that prevent the successful submission of a DMR through the eDMR system. In such situations, the permittee shall submit the DMR through the eDMR system within 5 days following remedy of the malfunction(s).

4. DMRs must be completed in accordance with DEP's published DMR instructions (3800-FM-BPNPSM0463). DMRs must be received by DEP no later than 28 days following the end of the monitoring period. DMRs are based on calendar reporting periods and must be received by DEP in accordance with the following schedule:

- Monthly DMRs must be received within 28 days following the end of each calendar month.
- Quarterly DMRs must be received within 28 days following the end of each calendar quarter, i.e., January 28, April 28, July 28, and October 28.
- Semiannual DMRs must be received within 28 days following the end of each calendar semiannual period, i.e., January 28 and July 28.
- Annual DMRs must be received by January 28, unless Part C of this permit requires otherwise.

5. The permittee shall complete all Supplemental Reporting forms (Supplemental DMRs) attached to this permit, or an approved equivalent, and submit the signed, completed forms as attachments to the DMR, through DEP's eDMR system. DEP's Supplemental Laboratory Accreditation Form (3800-FM-BPNPSM0189) must be completed and submitted to DEP with the first DMR following issuance of this permit, and anytime thereafter when changes to laboratories or methods occur. (25 Pa. Code §§ 92a.3(c), 92a.41(a), 92a.61(g) and 40 CFR § 122.41(l)(4))

6. The completed DMR Form shall be signed and certified by either of the following applicable persons, as defined in 25 Pa. Code § 92a.22:

- For a corporation - by a principal executive officer of at least the level of vice president, or an authorized representative, if the representative is responsible for the overall operation of the facility from which the discharge described in the NPDES form originates.
- For a partnership or sole proprietorship - by a general partner or the proprietor, respectively.
- For a municipality, state, federal or other public agency - by a principal executive officer or ranking elected official.

If signed by a person other than the above and for co-permittees, written notification of delegation of DMR signatory authority must be submitted to DEP in advance of or along with the relevant DMR form. (40 CFR § 122.22(b))

7. If the permittee monitors any pollutant at monitoring points as designated by this permit, using analytical methods described in Part A III.A.4. herein, more frequently than the permit requires, the results of this monitoring shall be incorporated, as appropriate, into the calculations used to report self-monitoring data on the DMR. (40 CFR 122.41(l)(4)(ii))

C. Reporting Requirements

1. Planned Changes to Physical Facilities – The permittee shall give notice to DEP as soon as possible but no later than 30 days prior to planned physical alterations or additions to the permitted facility. A permit under 25 Pa. Code Chapter 91 may be required for these situations prior to implementing the planned changes. A permit application, or other written submission to DEP, can be used to satisfy the notification requirements of this section.

   Notice is required when:

   a. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b). (40 CFR 122.41(l)(1)(i))

   b. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are not subject to effluent limitations in this permit. (40 CFR 122.41(l)(1)(ii))

   c. The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. (40 CFR 122.41(l)(1)(iii))

   d. The planned change may result in noncompliance with permit requirements. (40 CFR 122.41(l)(2))

2. Planned Changes to Waste Stream – Under the authority of 25 Pa. Code § 92a.24(a), the permittee shall provide notice to DEP as soon as possible but no later than 45 days prior to any planned changes in the volume or pollutant concentration of its influent waste stream as a result of indirect discharges or hauled-in wastes, as specified in paragraphs 2.a. and 2.b., below. Notice shall be provided on the “Planned Changes to Waste Stream” Supplemental Report (3800-FM-BPNPSM0482), available on DEP’s website. The permittee shall provide information on the quality and quantity of waste introduced into the facility, and any anticipated impact of the change on the quantity or quality of effluent to be discharged from the facility. The Report shall be sent via Certified Mail or other means to confirm DEP’s receipt of the notification. DEP will determine if the submission of a new application and receipt of a new or amended permit is required.

   a. Introduction of New Pollutants (25 Pa. Code § 92a.24(a))

      New pollutants are defined as parameters that meet all of the following criteria:

(i) Were not detected in the facilities' influent waste stream as reported in the permit application; and

(ii) Have not been approved to be included in the permittee's influent waste stream by DEP in writing.

The permittee shall provide notification of the introduction of new pollutants in accordance with paragraph 2 above. The permittee may not authorize the introduction of new pollutants until the permittee receives DEP's written approval.

b. Increased Loading of Approved Pollutants (25 Pa. Code § 92a.24(a))

Approved pollutants are defined as parameters that meet one or more of the following criteria:

(i) Were detected in the facilities' influent waste stream as reported in the permittee's permit application; or

(ii) Have been approved to be included in the permittee's influent waste stream by DEP in writing; or

(iii) Have an effluent limitation or monitoring requirement in this permit.

The permittee shall provide notification of the introduction of increased influent loading (lbs/day) of approved pollutants in accordance with paragraph 2 above when (1) the cumulative increase in influent loading (lbs/day) exceeds 20% of the maximum loading reported in the permit application, or a loading previously approved by DEP, or (2) may cause an exceedance in the effluent of Effluent Limitation Guidelines (ELGs) or limitations in Part A of this permit, or (3) may cause interference or pass through at the facility, or (4) may cause exceedances of the applicable water quality standards in the receiving stream. Unless specified otherwise in this permit, if DEP does not respond to the notification within 30 days of its receipt, the permittee may proceed with the increase in loading. The acceptance of increased loading of approved pollutants may not result in an exceedance of ELGs or effluent limitations and may not cause exceedances of the applicable water quality standards in the receiving stream.

3. Reporting Requirements for Hauled-In Wastes

a. Receipt of Residual Waste

(i) The permittee shall document the receipt of all hauled-in residual wastes (including but not limited to wastewater from oil and gas wells, food processing waste, and landfill leachate), as defined at 25 Pa. Code § 287.1, that are received for processing at the treatment facility. The permittee shall report hauled-in residual wastes on a monthly basis to DEP on the "Hauled In Residual Wastes" Supplemental Report (3800-FM-BPNPSM0450) as an attachment to the DMR. If no residual wastes were received during a month, submission of the Supplemental Report is not required.

The following information is required by the Supplemental Report. The information used to develop the Report shall be retained by the permittee for five years from the date of receipt and must be made available to DEP or EPA upon request.

(1) The dates that residual wastes were received.

(2) The volume (gallons) of wastes received.

(3) The license plate number of the vehicle transporting the waste to the treatment facility.

(4) The permit number(s) of the well(s) where residual wastes were generated, if applicable.

(5) The name and address of the generator of the residual wastes.

(6) The type of wastewater.

The transporter of residual waste must maintain these and other records as part of the daily operational record (25 Pa. Code § 299.219). If the transporter is unable to provide this information or the permittee has not otherwise received the information from the generator, the residual wastes shall not be accepted by the permittee until such time as the permittee receives such information from the transporter or generator.

(ii) The following conditions apply to the characterization of residual wastes received by the permittee:

(1) If the generator is required to complete a chemical analysis of residual wastes in accordance with 25 Pa. Code § 287.51, the permittee must receive and maintain on file a chemical analysis of the residual wastes it receives. The chemical analysis must conform to the Bureau of Waste Management's Form 26R except as noted in paragraph (2), below. Each load of residual waste received must be covered by a chemical analysis if the generator is required to complete it.

(2) For wastewater generated from hydraulic fracturing operations ("frac wastewater") within the first 30 production days of a well site, the chemical analysis may be a general frac wastewater characterization approved by DEP. Thereafter, the chemical analysis must be waste-specific and be reported on the Form 26R.

b. Receipt of Municipal Waste

(i) The permittee shall document the receipt of all hauled-in municipal wastes (including but not limited to septage and liquid sewage sludge), as defined at 25 Pa. Code § 271.1, that are received for processing at the treatment facility. The permittee shall report hauled-in municipal wastes on a monthly basis to DEP on the "Hauled In Municipal Wastes" Supplemental Report (3800-FM-BPNPSM0437) as an attachment to the DMR. If no municipal wastes were received during a month, submission of the Supplemental Report is not required.

The following information is required by the Supplemental Report:

(1) The dates that municipal wastes were received.

(2) The volume (gallons) of wastes received.

(3) The BOD_5 concentration (mg/l) and load (lbs) for the wastes received.

(4) The location(s) where wastes were disposed of within the treatment facility.

(ii) Sampling and analysis of hauled-in municipal wastes must be completed to characterize the organic strength of the wastes, unless composite sampling of influent wastewater is performed at a location downstream of the point of entry for the wastes.

4. Unanticipated Noncompliance or Potential Pollution Reporting

a. Immediate Reporting - The permittee shall immediately report any incident causing or threatening pollution in accordance with the requirements of 25 Pa. Code §§ 91.33 and 92a.41(b).

(i) If, because of an accident, other activity or incident a toxic substance or another substance which would endanger users downstream from the discharge, or would otherwise result in pollution or create a danger of pollution or would damage property, the permittee shall immediately notify DEP by telephone of the location and nature of the danger. Oral notification

to the Department is required as soon as possible, but no later than 4 hours after the permittee becomes aware of the incident causing or threatening pollution.

(ii) If reasonably possible to do so, the permittee shall immediately notify downstream users of the waters of the Commonwealth to which the substance was discharged. Such notice shall include the location and nature of the danger.

(iii) The permittee shall immediately take or cause to be taken steps necessary to prevent injury to property and downstream users of the waters from pollution or a danger of pollution and, in addition, within 15 days from the incident, shall remove the residual substances contained thereon or therein from the ground and from the affected waters of this Commonwealth to the extent required by applicable law.

b. The permittee shall report any noncompliance which may endanger health or the environment in accordance with the requirements of 40 CFR 122.41(l)(6). These requirements include the following obligations:

(i) 24 Hour Reporting - The permittee shall orally report any noncompliance with this permit which may endanger health or the environment within 24 hours from the time the permittee becomes aware of the circumstances. The following shall be included as information which must be reported within 24 hours under this paragraph:

(1) Any unanticipated bypass which exceeds any effluent limitation in the permit;

(2) Any upset which exceeds any effluent limitation in the permit; and

(3) Violation of the maximum daily discharge limitation for any of the pollutants listed in the permit as being subject to the 24-hour reporting requirement. (40 CFR 122.44(g))

(ii) Written Report - A written submission shall also be provided within 5 days of the time the permittee becomes aware of any noncompliance which may endanger health or the environment. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

(iii) Waiver of Written Report - DEP may waive the written report on a case-by-case basis if the associated oral report has been received within 24 hours from the time the permittee becomes aware of the circumstances which may endanger health or the environment. Unless such a waiver is expressly granted by DEP, the permittee shall submit a written report in accordance with this paragraph. (40 CFR 122.41(l)(6)(iii))

5. Other Noncompliance

The permittee shall report all instances of noncompliance not reported under paragraph C.4 of this section or specific requirements of compliance schedules, at the time DMRs are submitted, on the Non-Compliance Reporting Form (3800-FM-BPNPSM0440). The reports shall contain the information listed in paragraph C.4.b.(ii) of this section. (40 CFR 122.41(l)(7))

D. Specific Toxic Pollutant Notification Levels (for Manufacturing, Commercial, Mining, and Silvicultural Direct Dischargers) - The permittee shall notify DEP as soon as it knows or has reason to believe the following: (40 CFR 122.42(a))

1. That any activity has occurred, or will occur, which would result in the discharge of any toxic pollutant which is not limited in this permit, if that discharge on a routine or frequent basis will exceed the highest of the following "notification levels": (40 CFR 122.42(a)(1))

a. One hundred micrograms per liter.

b. Two hundred micrograms per liter for acrolein and acrylonitrile.

c. Five hundred micrograms per liter for 2,4-dinitrophenol and 2-methyl-4,6-dinitrophenol.

d. One milligram per liter for antimony.

e. Five times the maximum concentration value reported for that pollutant in this permit application.

f. Any other notification level established by DEP.

2. That any activity has occurred or will occur which would result in any discharge, on a nonroutine or infrequent basis, of a toxic pollutant which is not limited in this permit, if that discharge will exceed the highest of the following "notification levels": (40 CFR 122.42(a)(2))

a. Five hundred micrograms per liter.

b. One milligram per liter for antimony.

c. Ten times the maximum concentration value reported for that pollutant in the permit application.

d. Any other notification level established by DEP.

PART B

I. MANAGEMENT REQUIREMENTS

A. Compliance

1. The permittee shall comply with all conditions of this permit. If a compliance schedule has been established in this permit, the permittee shall achieve compliance with the terms and conditions of this permit within the time frames specified in this permit. (40 CFR 122.41(a)(1))

2. The permittee shall submit reports of compliance or noncompliance, or progress reports as applicable, for any interim and final requirements contained in this permit. Such reports shall be submitted no later than 14 days following the applicable schedule date or compliance deadline. (25 Pa. Code § 92a.51(c), 40 CFR 122.47(a)(4))

B. Permit Modification, Termination, or Revocation and Reissuance

1. This permit may be modified, terminated, or revoked and reissued during its term in accordance with 25 Pa. Code § 92a.72 and 40 CFR 122.41(f).

2. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition. (40 CFR 122.41(f))

3. In the absence of DEP action to modify or revoke and reissue this permit, the permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time specified in the regulations that establish those standards or prohibitions. (40 CFR 122.41(a)(1))

C. Duty to Provide Information

1. The permittee shall furnish to DEP, within a reasonable time, any information which DEP may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. (40 CFR 122.41(h))

2. The permittee shall furnish to DEP, upon request, copies of records required to be kept by this permit. (40 CFR 122.41(h))

3. Other Information - Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to DEP, it shall promptly submit the correct and complete facts or information. (40 CFR 122.41(l)(8))

D. Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance includes, but is not limited to, adequate laboratory controls including appropriate quality assurance procedures. This provision also includes the operation of backup or auxiliary facilities or similar systems that are installed by the permittee, only when necessary to achieve compliance with the terms and conditions of this permit. (40 CFR 122.41(e))

E. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or prevent any discharge, sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment. (40 CFR 122.41(d))

F. Bypassing

1. Bypassing Not Exceeding Permit Limitations - The permittee may allow a bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions in paragraphs two, three and four of this section. (40 CFR 122.41(m)(2))

2. Other Bypassing - In all other situations, bypassing is prohibited and DEP may take enforcement action against the permittee for bypass unless:

   a. A bypass is unavoidable to prevent loss of life, personal injury or "severe property damage." (40 CFR 122.41(m)(4)(i)(A))

   b. There are no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance. (40 CFR 122.41(m)(4)(i)(B))

   c. The permittee submitted the necessary notice required in F.4.a. and b. below. (40 CFR 122.41(m)(4)(i)(C))

3. DEP may approve an anticipated bypass, after considering its adverse effects, if DEP determines that it will meet the conditions listed in F.2. above. (40 CFR 122.41(m)(4)(ii))

4. Notice

   a. Anticipated Bypass – If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible, at least 10 days before the bypass. (40 CFR 122.41(m)(3)(i))

   b. Unanticipated Bypass – The permittee shall submit oral notice of any other unanticipated bypass within 24 hours, regardless of whether the bypass may endanger health or the environment or whether the bypass exceeds effluent limitations. The notice shall be in accordance with Part A III.C.4.b.

II. PENALTIES AND LIABILITY

A. Violations of Permit Conditions

Any person violating Sections 301, 302, 306, 307, 308, 318 or 405 of the Clean Water Act or any permit condition or limitation implementing such sections in a permit issued under Section 402 of the Act is subject to civil, administrative and/or criminal penalties as set forth in 40 CFR 122.41(a)(2).

Any person or municipality, who violates any provision of this permit; any rule, regulation or order of DEP; or any condition or limitation of any permit issued pursuant to the Clean Streams Law, is subject to criminal and/or civil penalties as set forth in Sections 602, 603 and 605 of the Clean Streams Law.

B. Falsifying Information

Any person who does any of the following:

- Falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit, or

- Knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit (including monitoring reports or reports of compliance or noncompliance)

Shall, upon conviction, be punished by a fine and/or imprisonment as set forth in 18 Pa.C.S.A § 4904 and 40 CFR 122.41(j)(5) and (k)(2).

C. Liability

Nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance pursuant to Section 309 of the Clean Water Act or Sections 602, 603 or 605 of the Clean Streams Law.

Nothing in this permit shall be construed to preclude the institution of any legal action or to relieve the permittee from any responsibilities, liabilities or penalties to which the permittee is or may be subject to under the Clean Water Act and the Clean Streams Law.

D. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for the permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. (40 CFR 122.41(c))

III. OTHER RESPONSIBILITIES

A. Right of Entry

Pursuant to Sections 5(b) and 305 of Pennsylvania's Clean Streams Law, and Title 25 Pa. Code Chapter 92a and 40 CFR 122.41(i), the permittee shall allow authorized representatives of DEP and EPA, upon the presentation of credentials and other documents as may be required by law:

1. To enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit; (40 CFR 122.41(i)(1))

2. To have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit; (40 CFR 122.41(i)(2))

3. To inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices or operations regulated or required under this permit; and (40 CFR 122.41(i)(3))

4. To sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act or the Clean Streams Law, any substances or parameters at any location. (40 CFR 122.41(i)(4))

B. Transfer of Permits

1. Transfers by modification. Except as provided in paragraph 2 of this section, a permit may be transferred by the permittee to a new owner or operator only if this permit has been modified or revoked and reissued, or a minor modification made to identify the new permittee and incorporate such other requirements as may be necessary under the Clean Water Act. (40 CFR 122.61(a))

2. Automatic transfers. As an alternative to transfers under paragraph 1 of this section, any NPDES permit may be automatically transferred to a new permittee if:

   a. The current permittee notifies DEP at least 30 days in advance of the proposed transfer date in paragraph 2.b. of this section; (40 CFR 122.61(b)(1))

   b. The notice includes the appropriate DEP transfer form signed by the existing and new permittees containing a specific date for transfer of permit responsibility, coverage and liability between them; (40 CFR 122.61(b)(2))

c. DEP does not notify the existing permittee and the proposed new permittee of its intent to modify or revoke and reissue this permit, the transfer is effective on the date specified in the agreement mentioned in paragraph 2.b. of this section; and (40 CFR 122.61(b)(3))

d. The new permittee is in compliance with existing DEP issued permits, regulations, orders and schedules of compliance, or has demonstrated that any noncompliance with the existing permits has been resolved by an appropriate compliance action or by the terms and conditions of the permit (including compliance schedules set forth in the permit), consistent with 25 Pa. Code § 92a.51 (relating to schedules of compliance) and other appropriate DEP regulations. (25 Pa. Code § 92a.71)

3. In the event DEP does not approve transfer of this permit, the new owner or operator must submit a new permit application.

C. Property Rights

The issuance of this permit does not convey any property rights of any sort, or any exclusive privilege. (40 CFR 122.41(g))

D. Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for a new permit. (40 CFR 122.41(b))

E. Other Laws

The issuance of this permit does not authorize any injury to persons or property or invasion of other private rights, or any infringement of state or local law or regulations.

IV. ANNUAL FEES

Permittees shall pay an annual fee in accordance with 25 Pa. Code § 92a.62. Annual fee amounts are specified in the following schedule and are due on each anniversary of the effective date of the most recent new or reissued permit. All flows identified in the schedule are annual average design flows. (25 Pa. Code § 92a. 62)

Minor IW Facility without ELG (Effluent Limitation Guideline)	$500
Minor IW Facility with ELG	$1,500
Major IW Facility < 250 MGD (million gallons per day)	$5,000
Major IW Facility ≥ 250 MGD	$25,000
IW Stormwater Individual Permit	$1,000
CAAP (Concentrated Aquatic Animal Production Facility)	$0

As of the effective date of this permit, the facility covered by the permit is classified in the following fee category: **Major IW Facility <250 MGD**.

Invoices for annual fees will be mailed to permittees approximately three months prior to the due date. In the event that an invoice is not received, the permittee is nonetheless responsible for payment. Throughout a five year permit term, permittees will pay four annual fees followed by a permit renewal application fee in the last year of permit coverage. Permittees may contact DEP at 717-787-6744 with questions related to annual fees. The fees identified above are subject to change in accordance with 25 Pa. Code § 92a.62(e).

Payment for annual fees shall be remitted to DEP at the address below by the anniversary date. Checks should be made payable to the Commonwealth of Pennsylvania.

PA Department of Environmental Protection
Bureau of Point and Non-Point Source Management

Re: Chapter 92a Annual Fee
P.O. Box 8466
Harrisburg, PA 17105-8466

PART C

I. OTHER REQUIREMENTS

A. The approval herein given is specifically made contingent upon the permittee acquiring all necessary property rights by easement or otherwise, providing for the satisfactory construction, operation, maintenance or replacement of all structures associated with the herein approved discharge in, along, or across private property, with full rights of ingress, egress and regress.

B. Collected screenings, slurries, sludges, and other solids shall be handled, recycled and/or disposed of in compliance with the Solid Waste Management Act (35 P.S. §§ 6018.101 – 6018.1003), 25 Pa. Code Chapters 287, 288, 289, 291, 295, 297, and 299 (relating to requirements for landfilling, impoundments, land application, composting, processing, and storage of residual waste), Chapters 261a, 262a, 263a, and 270a (related to identification of hazardous waste, requirements for generators and transporters, and hazardous waste, requirements for generators and transporters, and hazardous waste permit programs), federal regulation 40 CFR Part 257, The Clean Streams Law, and the Federal Clean Water Act and its amendments. Screenings collected at intake structures shall be collected and managed and not be returned to the receiving waters.

The permittee is responsible to obtain or assure that contracted agents have all necessary permits and approvals for the handling, storage, transport and disposal of solid waste materials generated as a result of wastewater treatment.

C. The terms and conditions of Water Quality Management (WQM) permits that may have been issued to the permittee relating to discharge requirements are superseded by this NPDES permit unless otherwise stated herein.

D. If the applicable standard or effluent guideline limitation relating to the application for Best Available Technology (BAT) Economically Achievable or to Best Conventional Technology (BCT) is developed by DEP or EPA for this type of industry, and if such standard or limitation is more stringent than the corresponding limitations of this permit (or if it controls pollutants not covered by this permit), DEP may modify or revoke and reissue the permit to conform with that standard or limitation.

E. The permittee shall optimize chlorine dosages used for disinfection or other purposes to minimize the concentration of Total Residual Chlorine (TRC) in the effluent, meet applicable effluent limitations, and reduce the possibility of adversely affecting the receiving waters. Optimization efforts may include an evaluation of wastewater characteristics, mixing characteristics, and contact times, adjustments to process controls, and maintenance of the disinfection facilities. If DEP determines that effluent TRC is causing adverse water quality impacts, DEP may reopen this permit to apply new or more stringent effluent limitations and/or require implementation of control measures or operational practices to eliminate such impacts.

Where the permittee does not use chlorine for primary or backup disinfection, but proposes the use of chlorine for cleaning or other purposes, the permittee shall notify DEP prior to initiating use of chlorine and monitor TRC concentrations in the effluent on each day in which chlorine is used. The results shall be submitted as an attachment to the DMR.

F. The permittee shall submit a Water Quality Management (WQM) permit application to DEP at least 90 days prior to the planned date for startup of construction activities associated with the upgrade of wastewater treatment facilities.

G. This discharge shall not cause a change in the stream temperature of more than 2°F during any one hour.

H. There shall be no net addition of pollutants to non-contact cooling water over intake values except for heat and water conditioning additives for which complete information was submitted in the application or is required to be submitted as a condition of this permit.

I. In accordance with ORSANCO's Pollution Control Standards, the permittee shall post and maintain a permanent marker at the establishment under permit as follows:

1. A marker shall be posted on the stream bank at each outfall discharging directly to the Ohio River (Outfalls 001 & 002).

2. The marker shall consist of, at a minimum, the name of the establishment to which the permit was issued, the permit number, and the outfall number. The information shall be printed in letters not less than two inches in height.

3. The marker shall be a minimum of two feet by two feet and shall be a minimum of three feet above ground level.

II. CHEMICAL ADDITIVES

A. Approved Chemical Additives List

1. The permittee is authorized to use chemical additives that are published on DEP's Approved Chemical Additives List (Approved List) (see www.depweb.state.pa.us/chemicaladditives) subject to paragraphs A.2 and A.3, below.

2. The permittee may not discharge a chemical additive at a concentration that is greater than the water quality-based effluent limitation (WQBEL) for the chemical additive or, if applicable, a technology-based effluent limitation. If effluent limitations are not specified in Part A of this permit for the chemical additive, the permittee is responsible for determining the WQBEL and ensuring the WQBEL is not exceeded by restricting usage to an amount that will not cause an excursion above in-stream water quality standards.

3. If the permittee decides to use a chemical additive that is on DEP's Approved List and the use would either (1) constitute an increase in the usage rate specified in the NPDES permit application or previous notification to DEP or (2) constitute a new use, not identified in the NPDES permit application or otherwise no previous notification occurred, the permittee shall complete and submit the "Chemical Additives Notification Form" (3800-FM-BPNPSM0487) to the DEP regional office that issued the permit. The permittee may proceed to use the chemical additive as reported on the Form upon receipt by the DEP regional office.

B. New Chemical Additives, Not on Approved Chemical Additives List

1. In the event the permittee wishes to use a chemical additive that is not listed on DEP's Approved List, the permittee shall submit the "New Chemical Additives Request Form" (3800-FM-BPNPSM0486) to DEP's Central Office, Bureau of Point and Non-Point Source Management (BPNPSM), Division of Planning and Permitting, Rachel Carson State Office Building, PO Box 8774, Harrisburg, PA 17105-8774, prior to use. A copy shall be submitted to the DEP regional office that issued the permit. The form must be completed in whole in order for BPNPSM to approve the chemical additive, and a Material Safety Data Sheet (MSDS) that meets the minimum requirements of 29 CFR 1910.1200(g) must be attached.

2. Following placement of the chemical additive on the Approved List, the permittee may submit the Chemical Additive Notification Form in accordance with paragraph A.3, above, to notify DEP of the intent to use the approved chemical additive. The permittee may proceed with usage when the new chemical has been identified on DEP's Approved List and following DEP's receipt of the Chemical Additives Notification Form.

3. The permittee shall restrict usage of chemical additives to the maximum usage rates determined and reported to DEP on Chemical Additives Notification Forms.

C. Chemical Additives Usage Reporting Requirements

The "Chemical Additives Usage Form" (3800-FM-BPNPSM0439) shall be used to report the usage of chemical additives and shall be submitted as an attachment to the Discharge Monitoring Report (DMR) at the time the DMR is submitted.

D. DEP may amend this permit to include WQBELs or otherwise control usage rates of chemical additives if there is evidence that usage is adversely affecting receiving waters, producing Whole Effluent Toxicity test failures, or is causing excursions of in-stream water quality standards.

III. REQUIREMENTS APPLICABLE TO STORMWATER OUTFALLS

A. The permittee is authorized to discharge non-polluting stormwater from its site, alone or in combination with other wastewaters, through the following outfalls:

Outfall No.	Area Drained (ft^2)	Latitude	Longitude	Description
006	-	40° 34' 28.7"	-80° 13' 27.8"	Stormwater

Monitoring requirements and effluent limitations for these outfalls are specified in Part A of this permit, if applicable.

B. Preparedness, Prevention and Contingency (PPC) Plan

The permittee must develop and implement a PPC Plan in accordance with 25 Pa. Code § 91.34 following the guidance contained in DEP's "Guidelines for the Development and Implementation of Environmental Emergency Response Plans" (DEP ID 400-2200-001), its NPDES-specific addendum and the minimum requirements below. For existing facilities, the PPC Plan must be developed prior to permit issuance. For new facilities, the PPC Plan must be submitted to DEP no later than prior to startup of facility operation.

1. The PPC Plan must identify all potential sources of pollutants that may reasonably be expected to affect the quality of stormwater discharges from the facility.

2. The PPC Plan must describe preventative measures and best management practices (BMPs) that will be implemented to reduce or eliminate pollutants from coming into contact with stormwater resulting from routine site activities and spills.

3. The PPC Plan must address actions that will be taken in response to on-site spills or other pollution incidents.

4. The PPC Plan must identify areas which, due to topography or other factors, have a high potential for soil erosion, and identify measures to limit erosion. Where necessary, erosion and sediment control measures must be developed and implemented in accordance with 25 Pa. Code Chapter 102 and DEP's "Erosion and Sediment Pollution Control Manual" (DEP ID 363-2134-008).

5. The PPC Plan must address security measures to prevent accidental or intentional entry which could result in an unintentional discharge of pollutants.

6. The PPC Plan must include a plan for training employees and contractors on pollution prevention, BMPs, and emergency response measures.

7. If the facility is subject to SARA Title III, Section 313, the PPC Plan must identify releases of "Water Priority Chemicals" within the previous three years. Water Priority Chemicals are those identified in EPA's "Guidance for the Determination of Appropriate Methods for the Detection of Section 313 Water Priority Chemicals" (EPA 833-B-94-001, April 1994). The Plan must include an evaluation of all activities that may result in the stormwater discharge of Water Priority Chemicals.

8. Spill Prevention Control and Countermeasure (SPCC) plans may be used to meet the requirements of

this section if the minimum requirements are addressed.

9. The PPC Plan shall be evaluated and if necessary updated on an annual basis, at a minimum, and when one or more of the following occur:

   a. The Plan fails in an emergency;

   b. There is a change in design, industrial process, operation, maintenance, or other circumstances, in a manner that materially increases the potential for fires, explosions or releases of toxic or hazardous constituents; or which changes the response necessary in an emergency;

   c. The list of emergency coordinators or equipment changes; or

   d. When notified in writing by DEP.

   All updates must be kept on-site and be made available to DEP upon request.

C. Minimum Required BMPs

In addition to BMPs identified in the PPC Plan, the permittee shall implement the following minimum BMPs relating to stormwater pollution prevention:

1. If applicable, post-construction stormwater BMPs that are required under 25 Pa. Code Chapter 102 must be maintained.

2. For industrial facilities, the BMPs in the applicable Appendix to the NPDES PAG-03 General Permit for Discharges of Stormwater Associated with Industrial Activities that is currently in effect.

3. For POTWs, all of the following:

   a. Manage sludge in accordance with all applicable permit requirements.

   b. Store chemicals in secure and covered areas on impervious surfaces away from storm drains.

   c. For new facilities and upgrades, design wastewater treatment facilities to avoid, to the maximum extent practicable, stormwater commingling with sanitary wastewater, sewage sludge, and biosolids.

   d. Efficiently use herbicides for weed control. Where practicable, use the least toxic herbicide that will achieve pest management objectives. Do not apply during windy conditions.

   e. Do not wash parts or equipment over impervious surfaces that wash into storm drains.

   f. Implement infiltration techniques, including infiltration basins, trenches, dry wells, porous pavement, etc., wherever practicable.

D. Annual Inspection and Compliance Evaluation

1. The permittee shall conduct an annual inspection of each outfall identified in paragraph A and record the results on the “Annual Inspection Form for NPDES Permits for Discharges of Stormwater Associated with Industrial Activities” (3800-PM-WSFR0083v). The permittee shall submit a copy of the completed and signed Annual Inspection Form to DEP at the address provided in Part A III.B.3 of this permit by January 28 of each year.

2. Areas contributing to a stormwater discharge associated with industrial activity shall be visually inspected for evidence of, or the potential for, pollutants entering the drainage system. BMPs in the PPC Plan and required by this permit shall be evaluated to determine whether they are adequate and properly implemented in accordance with the terms of this permit or whether additional control

measures are needed.

E. Stormwater Sampling Requirements

If stormwater sampling is required in Part A of this permit, the following requirements apply:

1. The permittee shall record stormwater sampling event information on the "Additional Information for the Reporting of Stormwater Discharge Monitoring" form (3800-PM-WSFR0083t) and submit the form as an attachment to the DMR.

2. All samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inch in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. The 72-hour storm interval is waived when the preceding storm did not yield a measurable discharge, or if the permittee is able to document that a less than 72-hour interval is representative for local storm events during the sample period.

3. Grab samples shall be taken during the first 30 minutes of the discharge. If the collection of a grab sample during the first 30 minutes is not possible, a grab sample can be taken during the first hour of the discharge, in which case the discharger shall provide an explanation of why a grab sample during the first 30 minutes was not possible.

F. Storm Water Pollution Prevention Plan (SWPPP) Outfalls 001, 002, 003, 004, & 005

The permittee shall submit a Storm Water Pollution Prevention Plan for Outfalls 001, 002, 003, 004, & 005 for review no later than twelve months after the permit effective date. The SWPPP shall identify Best Management Practices (BMP's), housekeeping procedures, and control structures installed or implemented to reduce the pollutant concentrations at Outfalls 001, 002, 003, 004, & 005. The plan shall also describe all measures that were implemented to meet eliminate or reduce the pollutants in the discharge.

The SWPPP should address the following stormwater pollutants:

Pollutant	Stormwater Goals (mg/L)
Total Suspended Solids	100.0
Oil and Grease	30.0
Chemical Oxygen Demand	120.0
Copper, total	1.28
Nickel, total	0.55
Zinc, total	1.02
Aluminum, total	0.75
Iron, total	1.50
Lead, total	0.0082

IV. SEDIMENTATION BASIN CLEANING

A. The permittee shall submit written notification to the DEP at least three weeks prior to the start of the periodic basin cleaning operations. The notification shall include the date and duration of the basin cleaning operations. In addition, the permittee shall provide documentation that identifies any deviations from the basin cleaning procedures outlined in the facility's PPC Plan.

B. The monitoring frequency for all parameters shall be daily during the period of dewatering of the sedimentation basins. The parameters with composite sample type shall be a 24-hour composite during

dewatering period. Additional measures shall be taken during dewatering of the sedimentation basins to prevent accumulated sediment loss to the stream. The Clean Water Program Operations Section shall be notified at least 48 hours prior to commencement of dewatering of basins.

C. Monitoring of turbidity during the period of dewatering of sedimentation basins shall be every two hours. The dewatering of the basins shall cease immediately when turbidity in any sample exceeds 100 NTU. A separate detailed monitoring report for this discharge shall be prepared and submitted with the monthly DMR.

Economy Borough Wastewater Treatment Plant

NPDES Permit Fact Sheet

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0218413**
Facility Type	**Municipal**	APS ID	**758875**
Major / Minor	**Major**	Authorization ID	**1221240**

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Economy Borough Municipal Authority**	Facility Name	**Big Sewickley Creek WWTP**
Applicant Address	2860 Conway Wallrose Road	Facility Address	120 Wine Road
	Baden, PA 15005-2306		Sewickley, PA 15143
Applicant Contact	Ms. Janet Miklos	Facility Contact	Mr. Joseph DeLuca
Applicant Phone	(724) 869-3201	Facility Phone	(724) 869-3201
Client ID	64903	Site ID	532567
Ch 94 Load Status	Not Overloaded	Municipality	Economy Borough
Connection Status	No Limitations	County	Beaver
Date Application Received	March 15, 2018	EPA Waived?	No
Date Application Accepted	March 20, 2018	If No, Reason	Major Facility

Purpose of Application: Application for a renewal of an existing NPDES Permit for the discharge of treated Sewage.

Summary of Review

The applicant has applied for a renewal of an existing NPDES Permit, Permit No. PA0218413, which was previously issued by the Department on August 27, 2013. That permit expired on August 31, 2018.

WQM Permit 400406, issued on August 29, 2001, approved construction of a STP with a hydraulic design capacity of 1.25 MGD. The existing treatment process consists of SBRs, UV Disinfection and aerobic digestion. Solids are dewatered via a belt filter press and disposed of at a municipal landfill.

The receiving stream, Big Sewickley Creek, is classified as a TSF and is located in State Watershed No. 20-G.

The applicant has complied with Act 14 Notifications and no comments were received.

Please note that any reference to 36th or 37th Month in the draft NPDES Permit will be changed to a specific date once PED has been established. I will also request additional sampling from the Authority for dissolved Iron, total mercury, total selenium, total zinc, and free cyanide. Based upon the results, these parameters will be reevaluated prior to issuance.

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		William C. Mitchell William C. Mitchell, E.I.T. / Environmental Engineering Specialist	June 18, 2020
X		Donald J. Leone Donald J. Leone, P.E. / Environmental Engineer Manager	June 24, 2020

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	1.25
Latitude	40º 35' 51.00"	Longitude	-8Âº 11' 05.00"
Quad Name	Ambridge	Quad Code	1404
Wastewater Description:	Sewage Effluent		
Receiving Waters	Big Sewickley Creek (TSF)	Stream Code	36596
NHD Com ID	99681622	RMI	3.43
Drainage Area	26.41	Yield (cfs/mi^2)	0.0058
Q_{7-10} Flow (cfs)	0.1532	Q_{7-10} Basis	USGS Low Flow Statistics, Sta. # 03086100
Elevation (ft)		Slope (ft/ft)	0.0057
Watershed No.	20-G	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	

Background/Ambient Data		Data Source
pH (SU)		
Temperature (°F)		
Hardness (mg/L)	116.8	Sampled by the Authority
Other:		

Nearest Downstream Public Water Supply Intake		Nova Chemical Beaver Valley Plant	
PWS Waters	Ohio River	Flow at Intake (cfs)	
PWS RMI		Distance from Outfall (mi)	

Changes Since Last Permit Issuance: None.

Treatment Facility Summary

Treatment Facility Name: Big Sewickley WWTP

WQM Permit No.	Issuance Date
400406	08/29/2001

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary with Ammonia Reduction	SBRs	Ultraviolet	0.412

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
1.25	2290	Not Overloaded	Aerobic Digestion/Belt Filter Press	Dewatered Solids are Hauled to a Municipal Landfill

Changes Since Last Permit Issuance: None

Compliance History

Operations Compliance Check Summary Report

Facility: Big Sewickley Creek WWTP

NPDES Permit No.: PA0218413

Compliance Review Period: 6/2015 – 6/2020

Inspection Summary:

INSP ID	INSPECTED DATE	INSP TYPE	INSPECTION RESULT DESC
2875331	05/02/2019	Compliance Evaluation	Violation(s) Noted
2768899	08/22/2018	Compliance Evaluation	Violation(s) Noted
2596928	05/04/2017	Compliance Evaluation	Violation(s) Noted
2452992	02/25/2016	Compliance Evaluation	No Violations Noted

Violation Summary:

VIOL ID	VIOLATION DATE	VIOLATION TYPE	VIOLATION TYPE DESC	RESOLVED DATE
848465	05/02/2019	92A.44	NPDES - Violation of effluent limits in Part A of permit	
848466	05/02/2019	92A.47(C)	NPDES - Illegal discharge to waters of the Commonwealth from a sanitary sewer overflow (SSO)	

826641	08/22/2018	92A.41(A)1	NPDES - Non-compliance with an issued permit, not classified by any other code	08/22/2018
826642	08/22/2018	92A.41(A)10C	NPDES - Failure to collect representative samples	08/22/2018
826643	08/22/2018	92A.44	NPDES - Violation of effluent limits in Part A of permit	08/22/2018
786366	05/04/2017	92A.41(A)1	NPDES - Non-compliance with an issued permit, not classified by any other code	05/24/2017
786367	05/04/2017	92A.44	NPDES - Violation of effluent limits in Part A of permit	05/24/2017

Open Violations by Client ID:

CLIENT ID	INSP ID	VIOLATION ID	VIOLATION DATE	VIOLATION CODE	VIOLATION
64903	2875331	848465	05/02/2019	92A.44	NPDES - Violation of effluent limits in Part A of permit
64903	2875331	848466	05/02/2019	92A.47(C)	NPDES - Illegal discharge to waters of the Commonwealth from a sanitary sewer overflow (SSO)

Enforcement Summary:

ENF ID	ENF TYPE	ENF TYPE DESC	ENF CREATION DATE	VIOLATIONS	# OF VIOLATIONS	ENF FINALSTATUS	ENF CLOSED DATE
376126	NOV	Notice of Violation	06/17/2019	92A.44; 92A.47(C)	2		
367063	NOV	Notice of Violation	08/29/2018	92A.41(A)1; 92A.41(A)10C; 92A.44	3	Administrative Close Out	08/30/2019
353606	NOV	Notice of Violation	05/24/2017	92A.41(A)1; 92A.44	2	Administrative Close Out	08/30/2019

DMR Violation Summary:

MONITORING START DATE	MONITORING END DATE	NON COMPLIANCE CATEGORY	PARAMETER	SAMPLE VALUE	PERMIT VALUE	UNIT OF MEASURE	STATISTICAL BASE CODE
04/01/2020	04/30/2020	Concentration 3 Effluent Violation	Bis(2-Ethylhexyl)Phthalate	< 0.005	0.003	mg/L	Daily Maximum
04/01/2020	04/30/2020	Concentration 3 Effluent Violation	Cyanide, Free	0.011	0.009	mg/L	Daily Maximum
05/01/2019	05/31/2019	Concentration 2 Effluent Violation	Ammonia-Nitrogen	3.8	2.0	mg/L	Average Monthly
01/01/2019	01/31/2019	Concentration 3 Effluent	Cyanide, Free	0.012	0.009	mg/L	Daily Maximum

		Violation					
12/01/2018	12/31/2018	Concentration 1 Effluent Violation	Dissolved Oxygen	5.47	6.0	mg/L	Minimum
08/01/2018	08/31/2018	Concentration 3 Effluent Violation	Cyanide, Free	0.014	0.009	mg/L	Daily Maximum
08/01/2018	08/31/2018	Concentration 2 Effluent Violation	Cyanide, Free	0.009	0.006	mg/L	Average Monthly
06/01/2018	06/30/2018	Concentration 3 Effluent Violation	Cyanide, Free	0.025	0.009	mg/L	Daily Maximum
06/01/2018	06/30/2018	Concentration 2 Effluent Violation	Cyanide, Free	0.013	0.006	mg/L	Average Monthly
05/01/2018	05/31/2018	Concentration 2 Effluent Violation	Cyanide, Free	0.008	0.006	mg/L	Average Monthly
05/01/2018	05/31/2018	Concentration 3 Effluent Violation	Cyanide, Free	0.015	0.009	mg/L	Daily Maximum
04/01/2018	04/30/2018	Concentration 3 Effluent Violation	Cyanide, Free	0.024	0.009	mg/L	Daily Maximum
04/01/2018	04/30/2018	Concentration 2 Effluent Violation	Cyanide, Free	0.020	0.006	mg/L	Average Monthly
03/01/2018	03/31/2018	Concentration 3 Effluent Violation	Cyanide, Free	0.019	0.009	mg/L	Daily Maximum
03/01/2018	03/31/2018	Concentration 2 Effluent Violation	Cyanide, Free	< 0.010	0.006	mg/L	Average Monthly
03/01/2018	03/31/2018	Load 2 Effluent Violation	Cyanide, Free	0.100	0.094	lbs/day	Daily Maximum
02/01/2018	02/28/2018	Load 2 Effluent Violation	Cyanide, Free	0.100	0.094	lbs/day	Daily Maximum
01/01/2018	01/31/2018	Concentration 3 Effluent Violation	Cyanide, Free	0.011	0.009	mg/L	Daily Maximum
01/01/2018	01/31/2018	Concentration 2 Effluent Violation	Cyanide, Free	0.008	0.006	mg/L	Average Monthly
12/01/2017	12/31/2017	Concentration 2 Effluent Violation	Copper, Total	0.020	0.012	mg/L	Average Monthly
12/01/2017	12/31/2017	Concentration 3 Effluent Violation	Copper, Total	0.019	0.018	mg/L	Daily Maximum
11/01/2017	11/30/2017	Concentration 2 Effluent Violation	Cyanide, Free	0.010	0.006	mg/L	Average Monthly
11/01/2017	11/30/2017	Concentration 3 Effluent	Cyanide, Free	0.027	0.009	mg/L	Daily Maximum

		Violation					
10/01/2017	10/31/2017	Concentration 3 Effluent Violation	Cyanide, Free	0.159	0.009	mg/L	Daily Maximum
10/01/2017	10/31/2017	Concentration 2 Effluent Violation	Copper, Total	0.074	0.012	mg/L	Average Monthly
10/01/2017	10/31/2017	Concentration 2 Effluent Violation	Cyanide, Free	0.050	0.006	mg/L	Average Monthly
10/01/2017	10/31/2017	Load 2 Effluent Violation	Cyanide, Free	0.300	0.094	lbs/day	Daily Maximum
10/01/2017	10/31/2017	Load 2 Effluent Violation	Copper, Total	0.600	0.188	lbs/day	Daily Maximum
10/01/2017	10/31/2017	Load 1 Effluent Violation	Copper, Total	0.200	0.125	lbs/day	Average Monthly
10/01/2017	10/31/2017	Concentration 3 Effluent Violation	Copper, Total	0.264	0.018	mg/L	Daily Maximum
10/01/2017	10/31/2017	Load 1 Effluent Violation	Cyanide, Free	0.090	0.063	lbs/day	Average Monthly
09/01/2017	09/30/2017	Concentration 3 Effluent Violation	Cyanide, Free	0.028	0.009	mg/L	Daily Maximum
09/01/2017	09/30/2017	Concentration 2 Effluent Violation	Cyanide, Free	0.020	0.006	mg/L	Average Monthly
08/01/2017	08/31/2017	Concentration 3 Effluent Violation	Cyanide, Free	0.025	0.009	mg/L	Daily Maximum
08/01/2017	08/31/2017	Concentration 3 Effluent Violation	Bis(2-Ethylhexyl)Phthalate	0.005	0.003	mg/L	Daily Maximum
08/01/2017	08/31/2017	Concentration 2 Effluent Violation	Cyanide, Free	< 0.010	0.006	mg/L	Average Monthly
07/01/2017	07/31/2017	Concentration 3 Effluent Violation	Cyanide, Free	0.022	0.009	mg/L	Daily Maximum
07/01/2017	07/31/2017	Concentration 2 Effluent Violation	Cyanide, Free	0.010	0.006	mg/L	Average Monthly
06/01/2017	06/30/2017	Concentration 2 Effluent Violation	Cyanide, Free	0.020	0.006	mg/L	Average Monthly
06/01/2017	06/30/2017	Concentration 3 Effluent Violation	Cyanide, Free	0.028	0.009	mg/L	Daily Maximum
05/01/2017	05/31/2017	Concentration 2 Effluent Violation	Cyanide, Free	< 0.010	0.006	mg/L	Average Monthly
05/01/2017	05/31/2017	Concentration 3 Effluent	Cyanide, Free	0.016	0.009	mg/L	Daily Maximum

		Violation					
03/01/2017	03/31/2017	Concentration 2 Effluent Violation	Cyanide, Free	0.009	0.006	mg/L	Average Monthly
03/01/2017	03/31/2017	Concentration 3 Effluent Violation	Cyanide, Free	0.019	0.009	mg/L	Daily Maximum
02/01/2017	02/28/2017	Concentration 2 Effluent Violation	Bis(2-Ethylhexyl)Phthalate	< 0.005	0.002	mg/L	Average Monthly
02/01/2017	02/28/2017	Concentration 3 Effluent Violation	Bis(2-Ethylhexyl)Phthalate	0.009	0.003	mg/L	Daily Maximum
01/01/2017	01/31/2017	Concentration 3 Effluent Violation	Cyanide, Free	0.020	0.009	mg/L	Daily Maximum
01/01/2017	01/31/2017	Concentration 2 Effluent Violation	Cyanide, Free	< 0.010	0.006	mg/L	Average Monthly
01/01/2017	01/31/2017	Load 1 Effluent Violation	Cyanide, Free	< 0.080	0.063	lbs/day	Average Monthly
01/01/2017	01/31/2017	Load 2 Effluent Violation	Cyanide, Free	0.200	0.094	lbs/day	Daily Maximum
12/01/2016	12/31/2016	Concentration 2 Effluent Violation	Cyanide, Free	0.007	0.006	mg/L	Average Monthly
12/01/2016	12/31/2016	Concentration 2 Effluent Violation	Cyanide, Free	0.007	0.006	mg/L	Average Monthly
09/01/2016	09/30/2016	Concentration 2 Effluent Violation	Bis(2-Ethylhexyl)Phthalate	< 0.033	0.002	mg/L	Average Monthly
09/01/2016	09/30/2016	Concentration 2 Effluent Violation	Copper, Total	0.013	0.012	mg/L	Average Monthly
09/01/2016	09/30/2016	Load 2 Effluent Violation	Bis(2-Ethylhexyl)Phthalate	0.385	0.031	lbs/day	Daily Maximum
09/01/2016	09/30/2016	Concentration 3 Effluent Violation	Cyanide, Free	0.020	0.009	mg/L	Daily Maximum
09/01/2016	09/30/2016	Load 1 Effluent Violation	Bis(2-Ethylhexyl)Phthalate	0.096	0.021	lbs/day	Average Monthly
09/01/2016	09/30/2016	Concentration 3 Effluent Violation	Bis(2-Ethylhexyl)Phthalate	0.130	0.003	mg/L	Daily Maximum
09/01/2016	09/30/2016	Load 2 Effluent Violation	Bis(2-Ethylhexyl)Phthalate	0.400	0.031	lbs/day	Daily Maximum
09/01/2016	09/30/2016	Concentration 2 Effluent Violation	Bis(2-Ethylhexyl)Phthalate	< 0.033	0.002	mg/L	Average Monthly
09/01/2016	09/30/2016	Load 1 Effluent	Bis(2-Ethylhexyl)Phthalat	< 0.100	0.021	lbs/day	Average Monthly

		Violation	e				
09/01/2016	09/30/2016	Load 2 Effluent Violation	Bis(2-Ethylhexyl)Phthalate	0.400	0.031	lbs/day	Daily Maximum
09/01/2016	09/30/2016	Concentration 2 Effluent Violation	Cyanide, Free	< 0.009	0.006	mg/L	Average Monthly
09/01/2016	09/30/2016	Load 1 Effluent Violation	Bis(2-Ethylhexyl)Phthalate	< 0.100	0.021	lbs/day	Average Monthly
09/01/2016	09/30/2016	Concentration 2 Effluent Violation	Cyanide, Free	< 0.009	0.006	mg/L	Average Monthly
09/01/2016	09/30/2016	Concentration 2 Effluent Violation	Bis(2-Ethylhexyl)Phthalate	0.032	0.002	mg/L	Average Monthly
09/01/2016	09/30/2016	Concentration 3 Effluent Violation	Cyanide, Free	0.020	0.009	mg/L	Daily Maximum
09/01/2016	09/30/2016	Concentration 3 Effluent Violation	Bis(2-Ethylhexyl)Phthalate	0.130	0.003	mg/L	Daily Maximum
09/01/2016	09/30/2016	Concentration 3 Effluent Violation	Cyanide, Free	0.020	0.009	mg/L	Daily Maximum
09/01/2016	09/30/2016	Concentration 3 Effluent Violation	Bis(2-Ethylhexyl)Phthalate	0.130	0.003	mg/L	Daily Maximum
06/01/2016	06/30/2016	Concentration 2 Effluent Violation	Fecal Coliform	250	200	CFU/100 ml	Geometric Mean

Compliance Status:

Ongoing .

Completed by: John Murphy

Completed date: 6/18/20

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 1.25
Latitude 40º 35' 51.00" **Longitude** -80º 11' 5.00"
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)

Water Quality-Based Limitations

A "Reasonable Potential Analysis" (Attached Toxics Screening Analysis Spreadsheet Version 2.7) determined the following parameters were candidates for limitations: total copper, free cyanide, dissolved iron, total lead, total mercury, total selenium, and total zinc.

Based upon the PENTOXSD, Version 2.0c, modeling results (output files attached), the Toxics Screening Analysis Spreadsheet recommends Monitoring for total lead and the following WQBELs in the table below.

The discharge was previously modeled using WQAM63 to evaluate the $CBOD_5$, Ammonia Nitrogen and Dissolved Oxygen parameters. Because there have been no changes to the discharge or the receiving stream, the limits for those parameters are based on the previously approved modeling results (output files attached). It is unnecessary to remodel those three parameters using the current WQM 7.0.

The following limitations were determined through water quality modeling (output files attached):

Parameter	Limit (mg/l)	SBC	Model
CBOD5 May 1 - Oct 31	15	Average Monthly	WQAM63
CBOD5 Nov 1 - Apr 30	25	Average Monthly	WQAM63
Dissolved Oxygen	6.0	Minimum	WQAM63
Ammonia-Nitrogen (May 1 – Oct 31)	2.0	Average Monthly	WQAM63
Ammonia-Nitrogen (Nov 1 – Apr 30)	3.5	Average Monthly	WQAM63
Iron, Dissolved	0.323	Average Monthly	PENTOXSD, Version 2.0c
Mercury, Total (ug/L)	0.054	Average Monthly	PENTOXSD, Version 2.0c
Selenium, Total	0.005	Average Monthly	PENTOXSD, Version 2.0c
Zinc, Total	0.104	Average Monthly	PENTOXSD, Version 2.0c
Copper, Total	0.012	Average Monthly	PENTOXSD, Version 2.0c
Cyanide, Free	0.006	Average Monthly	PENTOXSD, Version 2.0c

Best Professional Judgment (BPJ) Limitations

Comments: N/A

Anti-Backsliding

N/A

Additional Considerations:

Ultraviolet (UV) disinfection is used therefore Total Residual Chlorine (TRC) limits are not applicable. Routine monitoring of UV Transmittance will be at the same monitoring frequency that is used for TRC.

For pH, Dissolved Oxygen (DO) and UV Transmittance, a monitoring frequency 1/day has been imposed. In general, less frequent monitoring may be established only when the permittee demonstrates that there will be no discharge on days where monitoring is not required.

Nutrient monitoring is required to establish the nutrient load from the waste water treatment facility and the impacts that load may have on the quality of the receiving stream(s). A 1/quarter monitor and report requirement for Total N & Total P has been added to the permit as per Chapter 92.a.61.

Mass loading limits are applicable for publicly owned treatment works. Current policy requires average monthly mass loading limits be established for CBOD5, TSS, and NH_3-N and average weekly mass loading limits be established for CBOD5 and TSS. Average monthly mass loading limits (lbs/day) are based on the formula: design flow (MGD) x concentration limit (mg/L) x conversion factor (8.34).

Please note that changes were made to the Average Monthly & Average Weekly Mass Effluent Limitations for CBOD5, TSS and Ammonia Nitrogen. These changes were necessary to be consisted with rounding guidelines found in Chapter 5.C.2, Rounding-Off Mathematically Values, of the Department's Technical Guidance for the Development and Specification of Effluent Limitations, 362-0400-001.

For POTWs with design flows greater than 2,000 GPD influent BOD_5 and TSS monitoring must be established in the permit, and the monitoring should be consistent with the same frequency and sample type as is used for other effluent parameters.

Monitoring frequency for the proposed effluent limits are based upon Table 6-3, Self-Monitoring Requirements for Sewage Dischargers, from the Departments Technical Guidance for the Development and Specification of Effluent Limitations. Please note that Monitoring Requirements were changed for Flow to 2/week Metered to be consistent with the guidance.

Total Dissolved Solids (TDS) and its Major Constituents

Total Dissolved Solids (TDS) and its major constituents including sulfate, chloride, and bromide have emerged as pollutants of concern in several major watersheds in the Commonwealth. The conservative nature of these solids allows them to accumulate in surface waters and they may remain a concern even if the immediate downstream public water supply is not directly impacted. Bromide has been linked to formation of disinfection byproducts at increased levels in public water systems. In addition, as a consequence of actions associated with Triennial Review 13, the Environmental Quality Board has directed DEP to collect additional data related to sulfate, chloride, and 1,4-dioxane. Furthermore, in an August 2013 letter from Jon Capacasa of the Region III Water Protection Program to DEP (attached), EPA has expressed concern related to bromide and the importance of monitoring all point sources for bromide when it may be present.

Based on these concerns and under the authority of §92a.61, DEP has determined it should implement increased monitoring in NPDES permits for these parameters: TDS, sulfate, chloride, bromide, and 1,4-dioxane.

Increased monitoring in NPDES permits will only occur when the following conditions are met:

- Where the concentration of TDS in the discharge exceeds 1,000 mg/L, or the net TDS load from a discharge exceeds 20,000 lbs/day, and the discharge flow exceeds 0.1 MGD, Part A of the permit should include monitor and report for TDS, sulfate, chloride, and bromide. Discharges of 0.1 MGD or less should monitor and report for TDS, sulfate, chloride, and bromide if the concentration of TDS in the discharge exceeds 5,000 mg/L.

- Where the concentration of bromide in a discharge exceeds 1 mg/L and the discharge flow exceeds 0.1 MGD, Part A of the permit should include monitor and report for bromide. Discharges of 0.1 MGD or less should monitor and report for bromide if the concentration of bromide in the discharge exceeds 10 mg/L.

- Where the concentration of 1,4-dioxane (CAS 123-91-1) in a discharge exceeds 10 µg/L and the discharge flow exceeds 0.1 MGD, Part A of the permit should include monitor and report for 1,4-dioxane. Discharges of 0.1 MGD or less should monitor and report for 1,4-dioxane if the concentration of 1,4-dioxane in the discharge exceeds 100 µg/L.

Monitoring is not required for TDS, sulfate, chloride, bromide & 1,4-dioxane. Concentrations of bromide is less than 1 mg/L (application reports <0.1 mg/L), TDS is less than 1000 mg/L (application reports 436 mg/L) & 1,4-dioxane is less than 10 ug/L (application reports <5.0 ug/L).

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Whole Effluent Toxicity (WET)

For Outfall 001, ☐ **Acute** ☒ **Chronic** WET Testing was completed:

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

The dilution series used for the tests was: 100%, 97%, 93%, 47%, and 23%. The Target Instream Waste Concentration (TIWC) to be used for analysis of the results is: 93 %.

Summary of Four Most Recent Test Results

TST Data Analysis

(NOTE – Please see the attached DEP WET Analysis Spreadsheet).

Test Date	*Ceriodaphnia* Results (Pass/Fail)		*Pimephales* Results (Pass/Fail)	
	Survival	Reproduction	Survival	Growth
11/16/2014	PASS	PASS	PASS	PASS
11/10/2015	PASS	PASS	PASS	PASS
11/22/2016	PASS	PASS	PASS	PASS
11/07/2017	PASS	PASS	PASS	PASS

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

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

☐ **YES** ☒ **NO**

Comments: No

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

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

1. Determine IWC – Acute (IWCa):

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

[(1.25 MGD x 1.547) / ((0.1532 cfs x 1.0) + (1.25 MGD x 1.547))] x 100 = **92.66%**

Is IWCa < 1%? ☐ **YES** ☒ **NO (Chronic Test Required)**

Type of Test for Permit Renewal: **Chronic Testing**

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

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

[(1.25 MGD x 1.547) / ((0.1532 cfs x 1.0) + (1.25 MGD x 1.547))] x 100 = **92.66%**

3. Determine Dilution Series

(NOTE – check Attachment C of WET SOP for dilution series based on TIWCa or TIWCc, whichever applies).

Dilution Series = 100%, 97%, 93%, 47%, and 23%.

WET Limits

Has reasonable potential been determined? ☐ YES ☒ NO

Will WET limits be established in the permit? ☐ YES ☒ NO

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 36th Month.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Dissolved Iron	Report	Report	XXX	Report	Report	XXX	1/week	24-Hr Composite
Total Mercury (ug/L)	XXX	XXX	XXX	Report	Report	XXX	1/week	24-Hr Composite
Total Selenium	Report	Report	XXX	Report	Report	XXX	1/week	24-Hr Composite
Total Zinc	Report	Report	XXX	Report	Report	XXX	1/week	24-Hr Composite

Compliance Sampling Location: Outfall # 001

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: 37th Month through Permit Expiration Date.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Dissolved Iron	3.0	5.0	XXX	0.323	0.505	0.809	1/week	24-Hr Composite
Total Mercury (ug/L)	XXX	XXX	XXX	0.054	0.084	0.135	1/week	24-Hr Composite
Total Selenium	0.051	0.083	XXX	0.005	0.008	0.012	1/week	24-Hr Composite
Total Zinc	1.0	1.5	XXX	0.104	0.162	0.26	1/week	24-Hr Composite

Compliance Sampling Location: Outfall # 001

Proposed Effluent Limitations and Monitoring Requirements

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

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Instantaneous Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	2/week	Metered
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	6.0	XXX	XXX	XXX	1/day	Grab
CBOD5 Nov 1 - Apr 30	260.0	410.0 Wkly Avg	XXX	25.0	40.0 Wkly Avg	50	2/week	24-Hr Composite
CBOD5 May 1 - Oct 31	155.0	235.0 Wkly Avg	XXX	15.0	23.0 Wkly Avg	30	2/week	24-Hr Composite
BOD5 Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	2/week	24-Hr Composite
TSS	310.0	465.0 Wkly Avg	XXX	30.0	45.0 Wkly Avg	60	2/week	24-Hr Composite
TSS Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/week	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/week	Grab
UV Transmittance (%)	XXX	XXX	Report	XXX	XXX	XXX	1/day	Measured
Total Nitrogen	XXX	XXX	XXX	XXX	Report	XXX	1/quarter	24-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	36.0	XXX	XXX	3.5	XXX	7	2/week	24-Hr Composite
Ammonia-Nitrogen May 1 - Oct 31	20.0	XXX	XXX	2.0	XXX	4	2/week	24-Hr Composite

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	Daily Maximum	Instantaneous Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Total Phosphorus	XXX	XXX	XXX	XXX	Report	XXX	1/quarter	24-Hr Composite
Total Copper	0.125	0.188	XXX	0.012	0.018	0.029	1/week	24-Hr Composite
Free Cyanide	0.063	0.094	XXX	0.006	0.009	0.015	1/week	24-Hr Composite
Total Lead	Report	Report	XXX	Report	Report	XXX	1/week	24-Hr Composite

Compliance Sampling Location: Outfall # 001

TOXICS SCREENING ANALYSIS
WATER QUALITY POLLUTANTS OF CONCERN
VERSION 2.7

Facility: Big Sewickley Creek WWTP
Analysis Hardness (mg/L): 116.8
Stream Flow, Q_{7-10} (cfs): 0.153

NPDES Permit No.: PA0218413
Discharge Flow (MGD): 1.25

Outfall: 001
Analysis pH (SU): 7

	Parameter		Maximum Concentration in Application or DMRs (µg/L)	Most Stringent Criterion (µg/L)	Candidate for PENTOXSD Modeling?	Most Stringent WQBEL (µg/L)	Screening Recommendation
Group 1	Total Dissolved Solids		436000	500000	Yes		
	Chloride		144000	250000	Yes		
	Bromide	<	100	N/A	No		
	Sulfate		46300	250000	No		
Group 2	Total Aluminum		200	750	No		
	Total Antimony		0.8	5.6	No		
	Total Arsenic		2	10	No		
	Total Barium		118	2400	No		
	Total Beryllium		0.8	N/A	No		
	Total Boron		302	1600	No		
	Total Cadmium	<	0.08	0.304	No (Value < QL)		
	Total Chromium		2	N/A	No		
	Hexavalent Chromium	<	5	10.4	No		
	Total Cobalt		2	19	No		
	Total Copper		16	10.7	Yes	12.479	Establish Limits
	Free Available Cyanide	<	3.6	5.2	Yes	5.612	Establish Limits
	Total Cyanide			N/A			
	Dissolved Iron		200	300	Yes	323.764	Establish Limits
	Total Iron		26	1500	No		
	Total Lead		2	3.9	Yes	4.837	Monitor
	Total Manganese		20	1000	No		
	Total Mercury		0.03	0.05	Yes	0.054	Establish Limits
	Total Nickel		1	59.5	No		
	Total Phenols (Phenolics)	<	5	5	No (Value < QL)		
	Total Selenium		4	5.0	Yes	5.384	Establish Limits
	Total Silver		2	4.9	No		
	Total Thallium	<	0.8	0.24	No (Value < QL)		
	Total Zinc		77	136.7	Yes	136.7	Establish Limits
	Total Molybdenum		2	N/A	No		
Group 3	Acrolein	<	1	3	No (Value < QL)		
	Acrylonitrile	<	0.5	0.051	No (Value < QL)		
	Benzene	<	0.5	1.2	No (Value < QL)		
	Bromoform	<	0.5	4.3	No (Value < QL)		
	Carbon Tetrachloride	<	0.5	0.23	No (Value < QL)		
	Chlorobenzene	<	0.5	130	No (Value < QL)		
	Chlorodibromomethane	<	0.5	0.4	No (Value < QL)		
	Chloroethane	<	0.5	N/A	No		
	2-Chloroethyl Vinyl Ether	<	0.5	3500	No (Value < QL)		
	Chloroform	<	0.7	5.7	No		
	Dichlorobromomethane	<	0.5	0.55	No (Value < QL)		
	1,1-Dichloroethane	<	0.5	N/A	No		
	1,2-Dichloroethane	<	0.5	0.38	No (Value < QL)		
	1,1-Dichloroethylene	<	0.5	33	No (Value < QL)		
	1,2-Dichloropropane	<	0.5	2200	No (Value < QL)		
	1,3-Dichloropropylene	<	0.5	0.34	No (Value < QL)		
	1,4-Dioxane	<	5	N/A	No		
	Ethylbenzene	<	0.5	530	No (Value < QL)		
	Methyl Bromide	<	0.5	47	No (Value < QL)		
	Methyl Chloride	<	0.5	5500	No (Value < QL)		
	Methylene Chloride	<	0.5	4.6	No (Value < QL)		
	1,1,2,2-Tetrachloroethane	<	0.5	0.17	No (Value < QL)		
	Tetrachloroethylene	<	0.5	0.69	No (Value < QL)		
	Toluene	<	0.5	330	No (Value < QL)		
	1,2-trans-Dichloroethylene	<	0.5	140	No (Value < QL)		
	1,1,1-Trichloroethane	<	0.5	610	No (Value < QL)		
	1,1,2-Trichloroethane	<	0.5	0.59	No (Value < QL)		
	Trichloroethylene	<	0.5	2.5	No (Value < QL)		
	Vinyl Chloride	<	0.5	0.025	No (Value < QL)		
Group 4	2-Chlorophenol	<	1	81	No (Value < QL)		
	2,4-Dichlorophenol	<	1	77	No (Value < QL)		
	2,4-Dimethylphenol	<	1	130	No (Value < QL)		
	4,6-Dinitro-o-Cresol	<	1	13	No (Value < QL)		
	2,4-Dinitrophenol	<	1	69	No (Value < QL)		
	2-Nitrophenol	<	1	1600	No (Value < QL)		
	4-Nitrophenol	<	1	470	No (Value < QL)		
	p-Chloro-m-Cresol	<	1	30	No (Value < QL)		
	Pentachlorophenol	<	1	0.27	No (Value < QL)		
	Phenol	<	5	10400	No (Value < QL)		
	2,4,6-Trichlorophenol	<	1	1.4	No (Value < QL)		

Big Sewickley Creek STP Toxics Screening Analysis Spreadsheet (v 2.7), 5/7/2020

Group 5	Acenaphthene	<	1	17	No (Value < QL)		
	Acenaphthylene	<	1	N/A	No		
	Anthracene	<	1	8300	No (Value < QL)		
	Benzidine	<	5	0.000086	No (Value < QL)		
	Benzo(a)Anthracene	<	1	0.0038	No (Value < QL)		
	Benzo(a)Pyrene	<	1	0.0038	No (Value < QL)		
	3,4-Benzofluoranthene	<	1	0.0038	No (Value < QL)		
	Benzo(ghi)Perylene	<	1	N/A	No		
	Benzo(k)Fluoranthene	<	1	0.0038	No (Value < QL)		
	Bis(2-Chloroethoxy)Methane	<	1	N/A	No		
	Bis(2-Chloroethyl)Ether	<	1	0.03	No (Value < QL)		
	Bis(2-Chloroisopropyl)Ether	<	1	1400	No (Value < QL)		
	Bis(2-Ethylhexyl)Phthalate	<	3	1.2	No (Value < QL)		
	4-Bromophenyl Phenyl Ether	<	1	54	No (Value < QL)		
	Butyl Benzyl Phthalate	<	1	35	No (Value < QL)		
	2-Chloronaphthalene	<	1	1000	No (Value < QL)		
	4-Chlorophenyl Phenyl Ether	<	1	N/A	No		
	Chrysene	<	1	0.0038	No (Value < QL)		
	Dibenzo(a,h)Anthrancene	<	1	0.0038	No (Value < QL)		
	1,2-Dichlorobenzene	<	0.5	160	No (Value < QL)		
	1,3-Dichlorobenzene	<	0.5	69	No (Value < QL)		
	1,4-Dichlorobenzene	<	0.5	150	No (Value < QL)		
	3,3-Dichlorobenzidine	<	1	0.021	No (Value < QL)		
	Diethyl Phthalate	<	5.13	800	No		
	Dimethyl Phthalate	<	1	500	No (Value < QL)		
	Di-n-Butyl Phthalate	<	3	21	No (Value < QL)		
	2,4-Dinitrotoluene	<	1	0.05	No (Value < QL)		
	2,6-Dinitrotoluene	<	1	0.05	No (Value < QL)		
	Di-n-Octyl Phthalate	<	3	N/A	No		
	1,2-Diphenylhydrazine	<	1	0.036	No (Value < QL)		
	Fluoranthene	<	1	40	No (Value < QL)		
	Fluorene	<	1	1100	No (Value < QL)		
	Hexachlorobenzene	<	1	0.00028	No (Value < QL)		
	Hexachlorobutadiene	<	0.5	0.44	No (Value < QL)		
	Hexachlorocyclopentadiene	<	0.5	1	No (Value < QL)		
	Hexachloroethane	<	1	1.4	No (Value < QL)		
	Indeno(1,2,3-cd)Pyrene	<	1	0.0038	No (Value < QL)		
	Isophorone	<	1	35	No (Value < QL)		
	Naphthalene	<	1	43	No		
	Nitrobenzene	<	1	17	No (Value < QL)		
	n-Nitrosodimethylamine	<	1	0.00069	No (Value < QL)		
	n-Nitrosodi-n-Propylamine	<	1	0.005	No (Value < QL)		
	n-Nitrosodiphenylamine	<	1	3.3	No (Value < QL)		
	Phenanthrene	<	1	1	No (Value < QL)		
	Pyrene	<	1	830	No (Value < QL)		
	1,2,4-Trichlorobenzene	<	1	26	No		
Group 6	Aldrin	<		0.000049			
	alpha-BHC	<		0.0026			
	beta-BHC	<		0.0091			
	gamma-BHC	<		0.098			
	delta BHC	<		N/A			
	Chlordane	<		0.0008			
	4,4-DDT	<		0.00022			
	4,4-DDE	<		0.00022			
	4,4-DDD	<		0.00031			
	Dieldrin	<		0.000052			
	alpha-Endosulfan	<		0.056			
	beta-Endosulfan	<		0.056			
	Endosulfan Sulfate	<		N/A			
	Endrin	<		0.036			
	Endrin Aldehyde	<		0.29			
	Heptachlor	<		0.000079			
	Heptachlor Epoxide	<		0.000039			
	Toxaphene	<		0.0002			
	2,3,7,8-TCDD	<		0.000000005			
Group 7	Gross Alpha (pCi/L)	<		N/A			
	Total Beta (pCi/L)	<		N/A			
	Radium 226/228 (pCi/L)	<		N/A			
	Total Strontium	<		4000			
	Total Uranium	<		N/A			

PENTOXSD

Modeling Input Data

Stream Code	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope	PWS With (mgd)	Apply FC
36596	3.43	787.00	26.41	0.00000	0.00	☑

Stream Data

	LFY	Trib Flow	Stream Flow	WD Ratio	Rch Width	Rch Depth	Rch Velocity	Rch Trav Time	Tributary Hard	Tributary pH	Stream Hard	Stream pH	Analysis Hard	Analysis pH
	(cfsm)	(cfs)	(cfs)		(ft)	(ft)	(fps)	(days)	(mg/L)		(mg/L)		(mg/L)	
Q7-10	0.0058	0	0	18	27	1.5	0	0	116.8	7	0	0	0	0
Qh		0	0	0	0	0	0	0	100	7	0	0	0	0

Discharge Data

Name	Permit Number	Existing Disc Flow	Permitted Disc Flow	Design Disc Flow	Reserve Factor	AFC PMF	CFC PMF	THH PMF	CRL PMF	Disc Hard	Disc pH
		(mgd)	(mgd)	(mgd)						(mg/L)	
B Sewickley STP	PA0218413	0	1.25	0	0	0	0	0	0	132	7

Parameter Data

Parameter Name	Disc Conc	Trib Conc	Disc Daily CV	Disc Hourly CV	Steam Conc	Stream CV	Fate Coef	FOS	Crit Mod	Max Disc Conc
	(µg/L)	(µg/L)			(µg/L)					(µg/L)
COPPER	1E+07	0	0.5	0.5	0	0	0	0	1	0
CYANIDE, FREE	1E+07	0	0.5	0.5	0	0	0	0	1	0
DISSOLVED IRON	1E+07	0	0.5	0.5	0	0	0	0	1	0
LEAD	1E+07	0	0.5	0.5	0	0	0	0	1	0
MERCURY	1E+07	0	0.5	0.5	0	0	0	0	1	0
SELENIUM	1E+07	0	0.5	0.5	0	0	0	0	1	0
ZINC	1E+07	0	0.5	0.5	0	0	0	0	1	0

Stream Code	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope	PWS With (mgd)	Apply FC
36596	2.91	772.00	26.57	0.00000	0.00	☑

Stream Data

	LFY	Trib Flow	Stream Flow	WD Ratio	Rch Width	Rch Depth	Rch Velocity	Rch Trav Time	Tributary Hard	Tributary pH	Stream Hard	Stream pH	Analysis Hard	Analysis pH
	(cfsm)	(cfs)	(cfs)		(ft)	(ft)	(fps)	(days)	(mg/L)		(mg/L)		(mg/L)	
Q7-10	0.0058	0	0	18	27	1.5	0	0	100	7	0	0	0	0
Qh		0	0	0	0	0	0	0	100	7	0	0	0	0

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	AFC PMF	CFC PMF	THH PMF	CRL PMF	Disc Hard (mg/L)	Disc pH
		0	0	0	0	0	0	0	0	100	7

Parameter Data

Parameter Name	Disc Conc (µg/L)	Trib Conc (µg/L)	Disc Daily CV	Disc Hourly CV	Steam Conc (µg/L)	Stream CV	Fate Coef	FOS	Crit Mod	Max Disc Conc (µg/L)
COPPER	0	0	0.5	0.5	0	0	0	0	1	0
CYANIDE, FREE	0	0	0.5	0.5	0	0	0	0	1	0
DISSOLVED IRON	0	0	0.5	0.5	0	0	0	0	1	0
LEAD	0	0	0.5	0.5	0	0	0	0	1	0
MERCURY	0	0	0.5	0.5	0	0	0	0	1	0
SELENIUM	0	0	0.5	0.5	0	0	0	0	1	0
ZINC	0	0	0.5	0.5	0	0	0	0	1	0

PENTOXSD Analysis Results

Hydrodynamics

SWP Basin	Stream Code:	Stream Name:
20G	36596	BIG SEWICKLEY CREEK

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope	Depth (ft)	Width (ft)	WD Ratio	Velocity (fps)	Reach Trav Time (days)	CMT (min)
Q7-10 Hydrodynamics											
3.430	0.1532	0	0.1532	1.93375	0.0055	1.5	27	18	0.0515	0.6167	.039
2.910	0.1541	0	0.1541	NA	0	0	0	0	0	0	NA
Qh Hydrodynamics											
3.430	1.4416	0	1.4416	1.93375	0.0055	1.8534	27	14.568	0.0675	0.4711	.977
2.910	1.4492	0	1.4492	NA	0	0	0	0	0	0	NA

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number
3.43	B Sewickley STP	PA0218413

AFC

Q7-10: **CCT (min)** 0.039 **PMF** 1 **Analysis pH** 7 **Analysis Hardness** 130.884

Parameter	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
COPPER	0	0	0	0	17.318	18.04	19.469
	Dissolved WQC. Chemical translator of 0.96 applied.						
LEAD	0	0	0	0	86.461	115.008	124.118
	Dissolved WQC. Chemical translator of 0.752 applied.						
MERCURY	0	0	0	0	1.4	1.647	1.778
	Dissolved WQC. Chemical translator of 0.85 applied.						
SELENIUM	0	0	0	0	NA	NA	NA
ZINC	0	0	0	0	147.195	150.506	162.429
	Dissolved WQC. Chemical translator of 0.978 applied.						
CYANIDE, FREE	0	0	0	0	22	22	23.743
DISSOLVED IRON	0	0	0	0	NA	NA	NA

CFC

Q7-10: **CCT (min)** 0.039 **PMF** 1 **Analysis pH** 7 **Analysis Hardness** 130.884

Parameter	Stream Conc. (µg/L)	Stream CV	Trib Conc. (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
COPPER	0	0	0	0	11.272	11.741	12.671
	Dissolved WQC. Chemical translator of 0.96 applied.						
LEAD	0	0	0	0	3.369	4.482	4.837
	Dissolved WQC. Chemical translator of 0.752 applied.						
MERCURY	0	0	0	0	0.77	0.906	0.978
	Dissolved WQC. Chemical translator of 0.85 applied.						
SELENIUM	0	0	0	0	4.6	4.989	5.384
	Dissolved WQC. Chemical translator of 0.922 applied.						
ZINC	0	0	0	0	148.399	150.506	162.429
	Dissolved WQC. Chemical translator of 0.986 applied.						
CYANIDE, FREE	0	0	0	0	5.2	5.2	5.612
DISSOLVED IRON	0	0	0	0	NA	NA	NA

THH

Q7-10: **CCT (min)** 0.039 **PMF** NA **Analysis pH** NA **Analysis Hardness** NA

Parameter	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
COPPER	0	0	0	0	NA	NA	NA

PENTOXSD Analysis Results

Wasteload Allocations

RMI	Name	Permit Number							
3.43	**B Sewickley STP**	**PA0218413**							
	LEAD		0	0	0	0	NA	NA	NA
	MERCURY		0	0	0	0	0.05	0.05	0.054
	SELENIUM		0	0	0	0	NA	NA	NA
	ZINC		0	0	0	0	NA	NA	NA
	CYANIDE, FREE		0	0	0	0	140	140	151.09
	DISSOLVED IRON		0	0	0	0	300	300	323.764

CRL

Qh: **CCT (min)** 0.977 **PMF** 1

Parameter	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)
COPPER	0	0	0	0	NA	NA	NA
LEAD	0	0	0	0	NA	NA	NA
MERCURY	0	0	0	0	NA	NA	NA
SELENIUM	0	0	0	0	NA	NA	NA
ZINC	0	0	0	0	NA	NA	NA
CYANIDE, FREE	0	0	0	0	NA	NA	NA
DISSOLVED IRON	0	0	0	0	NA	NA	NA

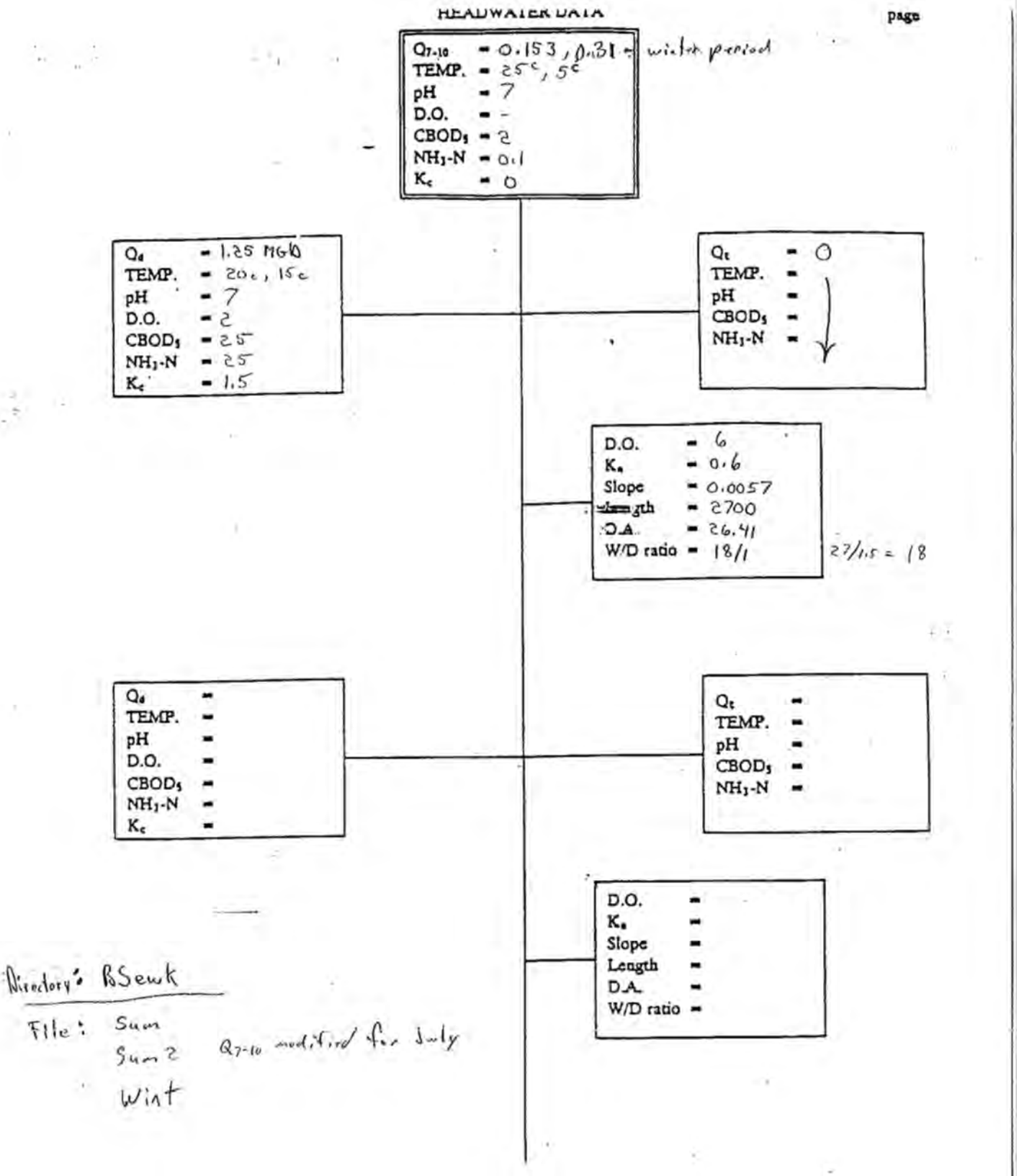
PENTOXSD Analysis Results

Recommended Effluent Limitations

SWP Basin	Stream Code:	Stream Name:
20G	36596	BIG SEWICKLEY CREEK

RMI	Name	Permit Number	Disc Flow (mgd)
3.43	B Sewickley STP	PA0218413	1.2500

Parameter	Effluent Limit (µg/L)	Governing Criterion	Max. Daily Limit (µg/L)	Most Stringent WQBEL (µg/L)	Most Stringent WQBEL Criterion
COPPER	12.479	AFC	19.469	12.479	AFC
CYANIDE, FREE	5.612	CFC	8.755	5.612	CFC
DISSOLVED IRON	323.764	THH	505.124	323.764	THH
LEAD	4.837	CFC	7.546	4.837	CFC
MERCURY	0.054	THH	0.084	0.054	THH
SELENIUM	5.384	CFC	8.4	5.384	CFC
ZINC	104.11	AFC	162.429	104.11	AFC


HEADWATER DATA
page
Q_{7-10} = 0.153, 0.31 = winter period
TEMP. = 25c, 5c
pH = 7
D.O. = -
$CBOD_5$ = 2
NH_3-N = 0.1
K_c = 0
Q_d = 1.25 MGD
TEMP. = 20c, 15c
pH = 7
D.O. = 2
$CBOD_5$ = 25
NH_3-N = 25
K_c = 1.5
Q_t = 0
TEMP. =
pH =
$CBOD_5$ =
NH_3-N =
D.O. = 6
K_a = 0.6
Slope = 0.0057
Length = 2700
D.A. = 26.41
W/D ratio = 18/1
27/1.5 = 18
Q_d =
TEMP. =
pH =
D.O. =
$CBOD_5$ =
NH_3-N =
K_c =
Q_t =
TEMP. =
pH =
$CBOD_5$ =
NH_3-N =
D.O. =
K_a =
Slope =
Length =
D.A. =
W/D ratio =
Directory: BSewk
File: Sum
Sum2 Q7-10 modified for July
Wint

USGS science for a changing world

Low-Flow Statistics for Pennsylvania Streams

Developed by the U.S. Geological Survey for the Pennsylvania Department of Environmental Protection

Pennsylvania Low-Flow Statistics - Query Results

LOW-FLOW STATISTICS

[All flow statistics in cubic feet per second (ft^3/s)]

Query run on 05/05/00

Mouse over or click on table headings to view definition of statistic

STREAM NAME: Big Sewickley Creek **GAGE OR BRIDGE SITE:** gage **STATION ID:** 03086100	**COUNTY:** ALLEGHENY **USGS QUAD:** Ambridge **PERIOD OF RECORD[1]:** 1968-78	**LATITUDE:** 40° 36' 27" **LONGITUDE:** 80° 09' 49" **DRAINAGE AREA (sq. mi.):** 15.6

$Q_{1,10}$	$Q_{7,10}$	$Q_{30,10}$	MEAN	MEDIAN	HARMONIC MEAN
**	0.09	0.13	17.27	7.60	1.14

FLOW DURATION TABLE (Probability of Exceedance)										
P5	P10	P20	P30	P40	P50	P60	P70	P80	P90	P95
65.30	41.00	25.60	17.30	11.90	7.60	4.90	3.10	1.60	0.58	0.29

[1]Period of Record for climatic year, April 1 through March 31

** Statistic has not been computed

$0.09\ cfs / 15.6\ mi^2 = 0.0058\ cfs/mi^2$

$Q_{30}/Q_7 = .13/.09 = 1.44$

RETURN TO PREVIOUS PAGE

RETURN TO START PAGE

```
 FILE: a:\bsewk\sum.wqm
Big Sewickley STP

             Default Data
a. Stream Values
   1  Q1-10/Q7-10 ratio.....................: .64
   2  Q30-10/Q7-10 ratio....................: 1.44
   3  Temperature...........................: 25
   4  pH....................................: 7
   5  C-BOD5................................: 2
   6  NH3-N.................................: .1
   7  D.O. Saturation (%)...................: .85
   8  D.O. Goal.............................: 6
   9  Width/Depth ratio.....................: 18
  10  KC...(Headwaters only!)...............: 0
  11  KN....................................: .6
b. Discharge Values (30-day avgs.)
  12  C-BOD5................................: 25
  13  NH3-N.................................: 25
  14  Effluent D.O..........................: 3
  15  Effluent Temp.........................: 20
  16  KC....................................: 1.5
  17  Balanced Technology(1=y 0=no).........: 0


(WQAM63.EXE)  Release 1.2     05-25-2000     09:04:42
```

2

FILE: a:\bsewk\sum.wqm
Big Sewickley STP

REACH # 1
Headwaters and Tributary data

No. of Reaches : 1

Rh	Q7-10 (cfs)	T (c)	pH (su)	DO (mg/l)	CBOD5 (mg/l)	NH3-N (mg/l)
HW	0.1530	25	7	7.12	2	.1
1	0.0000					

FILE: a:\bsewk\sum.wqm
Big Sewickley STP

Stream Characteristics

Rh	Q7-10 (cfs)	T (c)	pH (su)	DO (mg/l)	CBOD5 (mg/l)	NH3-N (mg/l)
1	.15	25	7	7.12	2	.1

Q 1-10/Q 7-10 = .64
Q 30-10/Q 7-10 = 1.44

(WQAM63.EXE) Release 1.2 05-25-2000 09:05:13

3

FILE: a:\bsewk\sum.wqm
Big Sewickley STP

DISCHARGE # 1
Discharger Data
Q7-10 Design Conditions

Rh	FLOW (MGD)	T (c)	pH (su)	DO (mg/l)	CBOD5 (mg/l)	NH3-N (mg/l)	KC (1/days)
1	1.2500	20	7	5	25	25	1.5

FILE: a:\bsewk\sum.wqm
Big Sewickley STP

REACH # 1
Reach Characteristics

Rh	D.O. GOAL	KN (/D)	RCH. SL. (FT/FT)	RCH. LEN. (FT.)	DRAIN AREA (MI^2)	W/D
1	6	.6	0.00570	2700	26.41	18

(WQAM63.EXE) Release 1.2 05-25-2000 09:05:33

4

FILE: a:\bsewk\sum.wqm
Big Sewickley STP

REACH # 1
Reach Characteristics

Rh	KR (/D)	TT (Days)
1	0	0

– Default to EPA velocity based equation

FILE: a:\bsewk\sum.wqm
Big Sewickley STP

NH3-N Discharge Allocations at Q30-10 (EMPR)

DIS	Q (mgd)	BASE. CONC. (mg/l)	MULT. CONC. (mg/l)	CRIT. RCH.	PCT. RED. (%)	NH3-N CRIT. (mg/l)
1	1.2500	2.05	2.05	0	0	1.85

(WQAM63.EXE) Release 1.2 05-25-2000 09:06:03

5

FILE: a:\bsewk\sum.wqm
Big Sewickley STP

NH3-N Discharge Allocations at Q1-10 (EMPR)

DIS	Q	BASE. CONC.	MULT. CONC.	CRIT. RCH.	PCT. RED.	NH3-N CRIT.
	(mgd)	(mg/l)	(mg/l)		(%)	(mg/l)
1	1.2500	9.98	9.98	0	0	9.51

FILE: a:\bsewk\sum.wqm
Big Sewickley STP

D.O. Allocations (EMPR)

DIS #	Q	---NH3-N--- IND. Conc.	CUM. Conc.	---CBOD5---- IND. Conc.	CUM. Conc.	CRIT. RCH.	PCT. REM.
	(MGD)	(mg/l)	(mg/l)	(mg/l)	(mg/l)		(%)
1	1.2500	2	2	15.6	15.6	0	0

(WQAM63.EXE) Release 1.2 05-25-2000 09:06:14

6

FILE: a:\bsewk\sum.wqm
Big Sewickley STP

(Total)Discharge	=	1.25	MGD				
Temp	=	20.4	pH	=	7	Width	= 15.51
CBOD-5	=	14.6	NH3-N	=	1.86	Depth	= 0.86
D.O.	=	6.08	D.O. Goal	=	6	Velocity	= 0.156
KC'	=	.924	KN	=	.6	W/D RATIO	= 18
KR	=	8.453	(TSIVOGLOU)				

Dis. 1 Rch. 1 Trvl Time: .2

Tr.Tm. (Days)	CBOD-5 (mg/l)	NH3-N (mg/l)	D.O. (mg/l)
0.020	14.33	1.84	6.08
0.040	14.06	1.82	6.09
0.060	13.80	1.79	6.10
0.080	13.54	1.77	6.12
0.100	13.29	1.75	6.14
0.120	13.04	1.73	6.17
0.140	12.80	1.71	6.20
0.160	12.56	1.69	6.23
0.180	12.33	1.66	6.27
0.200	12.10	1.64	6.31

no sag < 6 mg/l

FILE: a:\bsewk\sum.wqm
Big Sewickley STP

Summer

Effluent Limitations Display

DIS #	Q MGD	NH3-N TOX. 1 DAY	30 DAY	DISS. OXYGEN C-BOD5 30-DAY	NH3-N 30-DAY	EFF. D.O.
1	1.25	4.1	2	15.6	2	6

(WQAM63.EXE) Release 1.2 05-25-2000 09:06:36

7

FILE: a:\bsewk\wint.wqm
winter period analysis

REACH # 1
Headwaters and Tributary data

No. of Reaches : 1

Rh	Q7-10 (cfs)	T (c)	pH (su)	DO (mg/l)	CBOD5 (mg/l)	NH3-N (mg/l)
HW	0.3100	5	7	10.82	2	.1
1	0.0000					

FILE: a:\bsewk\wint.wqm
winter period analysis

Stream Characteristics

Rh	Q7-10 (cfs)	T (c)	pH (su)	DO (mg/l)	CBOD5 (mg/l)	NH3-N (mg/l)
1	.31	5	7	10.82	2	.1

Q 1-10/Q 7-10 = .64
Q 30-10/Q 7-10 = 1.36

(WQAM63.EXE) Release 1.2 05-25-2000 09:16:50

8

FILE: a:\bsewk\wint.wqm
winter period analysis

DISCHARGE # 1
Discharger Data
Q7-10 Design Conditions

Rh	FLOW (MGD)	T (c)	pH (su)	DO (mg/l)	CBOD5 (mg/l)	NH3-N (mg/l)	KC (1/days)
1	1.2500	15	7	6	25	6	1.5

FILE: a:\bsewk\wint.wqm
winter period analysis

REACH # 1
Reach Characteristics

Rh	D.O. GOAL	KN (/D)	RCH. SL. (FT/FT)	RCH. LEN. (FT.)	DRAIN AREA (MI^2)	W/D
1	6	.6	0.00570	2700	26.41	18

(WQAM63.EXE) Release 1.2 05-25-2000 09:17:28

9

FILE: a:\bsewk\wint.wqm
winter period analysis

REACH # 1
Reach Characteristics

Rh	KR (/D)	TT (Days)
1	0	0

- Default to EPA velocity based equation

FILE: a:\bsewk\wint.wqm
winter period analysis

NH3-N Discharge Allocations at Q30-10 (EMPR)

DIS	Q (mgd)	BASE. CONC. (mg/l)	MULT. CONC. (mg/l)	CRIT. RCH.	PCT. RED. (%)	NH3-N CRIT. (mg/l)
1	1.2500	3.85	3.85	0	0	3.18

(WQAM63.EXE) Release 1.2 05-25-2000 09:18:05

10

FILE: a:\bsewk\wint.wqm
winter period analysis

NH3-N Discharge Allocations at Q1-10 (EMPR)

DIS	Q	BASE. CONC.	MULT. CONC.	CRIT. RCH.	PCT. RED.	NH3-N CRIT.
	(mgd)	(mg/l)	(mg/l)		(%)	(mg/l)
1	1.2500	12.00	12.00	0	0	15.04

FILE: a:\bsewk\wint.wqm
winter period analysis

D.O. Allocations (EMPR)

DIS #	Q	---NH3-N--- IND. Conc.	CUM. Conc.	---CBOD5---- IND. Conc.	CUM. Conc.	CRIT. RCH.	PCT. REM.
	(MGD)	(mg/l)	(mg/l)	(mg/l)	(mg/l)		(%)
1	1.2500	3.9	3.9	25	25	0	0

(WQAM63.EXE) Release 1.2 05-25-2000 09:18:23

11

FILE: a:\bsewk\wint.wqm
winter period analysis

(Total)Discharge = 1.25 MGD

Temp	=	13.6	pH	=	7	Width	= 15.76
CBOD-5	=	21.82	NH3-N	=	3.37	Depth	= 0.88
D.O.	=	6.67	D.O. Goal	=	6	Velocity	= 0.163
KC'	=	1.479	KN	=	.6	W/D RATIO	= 18
KR	=	8.804	(TSIVOGLOU)				

Dis. 1 Rch. 1 Trvl Time: .192

Tr.Tm. (Days)	CBOD-5 (mg/l)	NH3-N (mg/l)	D.O. (mg/l)
0.019	21.36	3.35	6.52
0.038	20.92	3.33	6.40
0.058	20.48	3.30	6.32
0.077	20.05	3.28	6.27
0.096	19.63	3.26	6.23
0.115	19.21	3.24	6.22
0.135	18.81	3.21	6.22
0.154	18.42	3.19	6.23
0.173	18.03	3.17	6.25
0.192	17.65	3.14	6.28

FILE: a:\bsewk\wint.wqm
winter period analysis

Effluent Limitations Display

DIS #	Q MGD	NH3-N TOX. 1 DAY	30 DAY	DISS. OXYGEN C-BOD5 30-DAY	NH3-N 30-DAY	EFF. D.O.
1	1.25	7.7	3.9	25	3.9	6

7 3.5

Round down to nearest 0.5 mg/l, as per ammonia implementation guidance.

(WQAM63.EXE) Release 1.2 05-25-2000 09:18:49

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Ceriodaphnia
Endpoint	Reproduction
TIWC (decimal)	0.93
No. Per Replicate	1
TST b value	0.75
TST alpha value	0.2

Facility Name
Economy Borough MA - Big Sewickley Creek WWTP

Permit No.
PA0218413

Test Completion Date: 11/18/2014

Replicate No.	Control	TIWC
1	21	31
2	30	36
3	26	37
4	22	36
5	32	37
6	25	32
7	22	30
8	26	31
9	25	32
10	20	38
11		
12		
13		
14		
15		
Mean	24.900	34.000
Std Dev.	3.872	3.055
# Replicates	10	10

T-Test Result	11.4980
Deg. of Freedom	17
Critical T Value	0.8633
Pass or Fail	PASS

Test Completion Date: 11/10/2015

Replicate No.	Control	TIWC
1	4	37
2	34	37
3	36	37
4	40	36
5	35	40
6	31	42
7	38	39
8	36	38
9	36	36
10	32	31
11		
12		
13		
14		
15		
Mean	32.200	37.300
Std Dev.	10.250	2.908
# Replicates	10	10

T-Test Result	5.0594
Deg. of Freedom	16
Critical T Value	0.8647
Pass or Fail	PASS

Test Completion Date: 11/22/2016

Replicate No.	Control	TIWC
1	29	41
2	31	40
3	32	34
4	31	44
5	36	43
6	34	39
7	36	42
8	25	43
9	33	42
10	40	40
11		
12		
13		
14		
15		
Mean	32.700	40.800
Std Dev.	4.165	2.860
# Replicates	10	10

T-Test Result	12.1530
Deg. of Freedom	17
Critical T Value	0.8633
Pass or Fail	PASS

Test Completion Date: 11/7/2017

Replicate No.	Control	TIWC
1	25	27
2	24	28
3	26	29
4	29	33
5	26	33
6	26	35
7	28	32
8	27	17
9	26	35
10	27	33
11		
12		
13		
14		
15		
Mean	26.400	30.200
Std Dev.	1.430	5.412
# Replicates	10	10

T-Test Result	5.9610
Deg. of Freedom	11
Critical T Value	0.8755
Pass or Fail	PASS

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Ceriodaphnia
Endpoint	Survival
TIWC (decimal)	0.93
No. Per Replicate	1
TST b value	0.75
TST alpha value	0.2

Facility Name
Economy Borough MA - Big Sewickley Creek WWTP

Permit No.
PA0218413

Test Completion Date: 11/18/2014

Replicate No.	Control	TIWC
1	1	1
2	1	1
3	1	1
4	1	1
5	1	1
6	1	1
7	1	1
8	1	1
9	1	1
10	1	1
11		
12		
13		
14		
15		
Mean	1.000	1.000
Std Dev.	0.000	0.000
# Replicates	10	10
T-Test Result		
Deg. of Freedom		
Critical T Value		
Pass or Fail	PASS	

Test Completion Date: 11/10/2015

Replicate No.	Control	TIWC
1	0	1
2	1	1
3	1	1
4	1	1
5	1	1
6	1	1
7	1	1
8	1	1
9	1	1
10	1	1
11		
12		
13		
14		
15		
Mean	0.900	1.000
Std Dev.	0.316	0.000
# Replicates	10	10
T-Test Result		
Deg. of Freedom		
Critical T Value		
Pass or Fail	PASS	

Test Completion Date: 11/22/2016

Replicate No.	Control	TIWC
1	1	1
2	1	1
3	1	1
4	1	1
5	1	1
6	1	1
7	1	1
8	1	1
9	1	1
10	1	1
11		
12		
13		
14		
15		
Mean	1.000	1.000
Std Dev.	0.000	0.000
# Replicates	10	10
T-Test Result		
Deg. of Freedom		
Critical T Value		
Pass or Fail	PASS	

Test Completion Date: 11/7/2017

Replicate No.	Control	TIWC
1	1	1
2	1	1
3	1	1
4	1	1
5	1	1
6	1	1
7	1	1
8	1	0
9	1	1
10	1	1
11		
12		
13		
14		
15		
Mean	1.000	0.900
Std Dev.	0.000	0.316
# Replicates	10	10
T-Test Result		
Deg. of Freedom		
Critical T Value		
Pass or Fail	PASS	

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Pimephales
Endpoint	Survival
TIWC (decimal)	0.93
No. Per Replicate	10
TST b value	0.75
TST alpha value	0.25

Facility Name: Economy Borough MA - Big Sewickley Creek WWTP

Permit No.: PA0218413

Test Completion Date: 11/18/2014

Replicate No.	Control	TIWC
1	1	0.7
2	1	1
3	1	0.8
4	1	1
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	1.000	0.875
Std Dev.	0.000	0.150
# Replicates	4	4

T-Test Result	4.3376
Deg. of Freedom	3
Critical T Value	0.7649
Pass or Fail	PASS

Test Completion Date: 11/10/2015

Replicate No.	Control	TIWC
1	0.9	0.9
2	0.9	0.8
3	0.9	1
4	1	1
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.925	0.925
Std Dev.	0.050	0.096
# Replicates	4	4

T-Test Result	8.6068
Deg. of Freedom	4
Critical T Value	0.7407
Pass or Fail	PASS

Test Completion Date: 11/22/2016

Replicate No.	Control	TIWC
1	1	1
2	1	1
3	1	1
4	1	1
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	1.000	1.000
Std Dev.	0.000	0.000
# Replicates	4	4

T-Test Result	
Deg. of Freedom	
Critical T Value	
Pass or Fail	PASS

Test Completion Date: 11/7/2017

Replicate No.	Control	TIWC
1	1	1
2	1	1
3	1	1
4	1	1
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	1.000	1.000
Std Dev.	0.000	0.000
# Replicates	4	4

T-Test Result	
Deg. of Freedom	
Critical T Value	
Pass or Fail	PASS

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Pimephales
Endpoint	Growth
TIWC (decimal)	0.93
No. Per Replicate	10
TST b value	0.75
TST alpha value	0.25

Facility Name: Economy Borough MA - Big Sewickley Creek WWTP

Permit No.: PA0218413

Test Completion Date: 11/16/2014

Replicate No.	Control	TIWC
1	0.346	0.313
2	0.357	0.435
3	0.294	0.288
4	0.289	0.359
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.322	0.349
Std Dev.	0.035	0.065
# Replicates	4	4

T-Test Result	3.0878
Deg. of Freedom	4
Critical T Value	0.7407
Pass or Fail	PASS

Test Completion Date: 11/10/2015

Replicate No.	Control	TIWC
1	0.359	0.375
2	0.393	0.259
3	0.342	0.313
4	0.422	0.354
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.379	0.325
Std Dev.	0.036	0.051
# Replicates	4	4

T-Test Result	1.4213
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	PASS

Test Completion Date: 11/22/2016

Replicate No.	Control	TIWC
1	0.331	0.38
2	0.383	0.375
3	0.376	0.431
4	0.37	0.415
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.365	0.400
Std Dev.	0.023	0.027
# Replicates	4	4

T-Test Result	7.8384
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	PASS

Test Completion Date: 11/7/2017

Replicate No.	Control	TIWC
1	0.453	0.442
2	0.5056	0.44
3	0.411	0.416
4	0.299	0.433
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.417	0.433
Std Dev.	0.088	0.012
# Replicates	4	4

T-Test Result	3.5856
Deg. of Freedom	4
Critical T Value	0.7407
Pass or Fail	PASS

WET Summary and Evaluation

Facility Name	Big Sewickley Creek WWTP
Permit No.	PA0218413
Design Flow (MGD)	1.25
Q_{7-10} Flow (cfs)	0.153
PMF_a	1
PMF_c	1

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	11/18/14	11/10/15	11/22/16	11/7/17
Ceriodaphnia	Reproduction	PASS	PASS	PASS	PASS

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	11/18/14	11/10/15	11/22/16	11/7/17
Ceriodaphnia	Survival	PASS	PASS	PASS	PASS

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	11/18/14	11/10/15	11/22/16	11/7/17
Pimephales	Survival	PASS	PASS	PASS	PASS

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	11/16/14	11/10/15	11/22/16	11/7/17
Pimephales	Growth	PASS	PASS	PASS	PASS

Reasonable Potential? NO

Permit Recommendations

Test Type	**Chronic**
TIWC	**93** % Effluent
Dilution Series	**23, 47, 93, 97, 100** % Effluent
Permit Limit	**None**
Permit Limit Species	

Attachment K

Wetland Determination Report

WETLAND AND STREAM DELINEATION REPORT

BIG SEWICKLEY CREEK – WATER WITHDRAWAL
ECONOMY BOROUGH,
BEAVER COUNTY, PENNSYLVANIA

Prepared For:

PENNENERGY RESOURCES, LLC
1000 COMMERCE DRIVE
PARK PLACE ONE, SUITE 400
PITTSBURGH, PENNSYLVANIA 15275

Prepared By:

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
4350 NORTHERN PIKE, SUITE 141
MONROEVILLE, PENNSYLVANIA 15146

CEC Project 191-981

June 7, 2021
Revised May 1, 2023

TABLE OF CONTENTS

FIGURES

APPENDICES

1.0 INTRODUCTION

This report presents the findings of a wetland and stream delineation completed by Civil & Environmental Consultants, Inc. (CEC) for the Big Sewickley Creek – Water Withdrawal located in Economy Borough, Beaver County, Pennsylvania (Figure WDR-1). CEC conducted the delineation at the request of PennEnergy Resources, LLC.

The purpose of the delineation was to identify and delineate wetlands, streams, and other waterbodies within the proposed project area.

1.1 METHODOLOGY

The wetland and stream delineation was based on CEC's professional judgment and interpretation of the technical criteria presented in the 1987 *U.S. Army Corps of Engineers Wetlands Delineation Manual* (1987 Manual) and the 2012 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region Version 2.0* (2012 Regional Supplement). CEC completed the following scope of services to identify and delineate wetland and stream boundaries at the site:

1. Office Data Review: CEC personnel reviewed the U.S. Geological Survey (USGS) topographic mapping (Figure WDR-1), the U.S. Department of Agriculture (USDA)/Natural Resources Conservation Service (NRCS) Web Soil Survey (http://websoilsurvey.nrcs.usda.gov) (Figure WDR-2), and the U.S. Fish & Wildlife Service (USFWS) National Wetlands Inventory (NWI) Map (Figure WDR-2). These resources were used to establish site characteristics that could aid in the identification of potential wetlands and streams.

2. On-site Field Review: Qualified CEC biologists performed the delineation at the site on May 17 and June 2, 2021*; **and January 25, 2023***. The delineation boundary comprised approximately 2 acres. CEC delineated wetland boundaries using the routine on-site

determination method described in the 1987 Manual supplemented by the 2012 Regional Supplement and the ***2020*** National Wetland Plant List. First, plant communities present on the site were identified. The dominant plant species within each community were identified and a determination made on whether the plant community was dominated by hydrophytic (wetland) plants. Next, a representative test site was located within the plant community and soils were sampled using a tile spade to determine if hydric soil indicators were present. Lastly, the test site was reviewed to determine if indicators of wetland hydrology (ponding, soil saturation, etc.) were present. Wetland boundaries and test site locations were georeferenced using a Trimble TDC150 Global Positioning System (GPS) unit.

In addition to identifying wetlands, CEC identified streams within the delineation boundary that would likely be considered jurisdictional by state and federal regulatory agencies. Streams were classified as perennial, intermittent, and ephemeral as defined below:

- Perennial Stream - A perennial stream has flowing water year-round during a typical year. The water table is located above the streambed for most of the year. Groundwater is the primary source of water for stream flow. Runoff from rainfall is a supplementary source of water for stream flow;

- Intermittent Stream - An intermittent stream has flowing water during certain times of the year when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from rainfall is a supplementary source of water for stream flow; and

- Ephemeral Stream - An ephemeral stream has flowing water only during, and for a short duration after, precipitation events in a typical year. Ephemeral streambeds are located above the water table year-round. Groundwater is not a source for stream flow. Runoff from rainfall is the primary source of water for stream flow.

3. Data Collection: Wetland determination data forms for the routine on-site determination method were completed for test site locations to record the vegetation, soils, and hydrology observations used in making the wetland determination. Stream data forms were completed for streams to record hydrological, flow, water quality, and biological characteristics. Completed data forms are included in Appendix A. Photographs taken during the field work are included in Appendix B.

2.0 FINDINGS

2.1 OFFICE DATA REVIEW

The USDA/NRCS on-line soil mapping tool, *Web Soil Survey*, identifies two soil mapping units within the delineation boundary (Figure WDR-2). These soils are summarized in Table 1.

TABLE 1
SOILS INFORMATION[(1)]

Soil Mapping Unit Symbol	Soil Mapping Unit Name	Drainage Class	Hydric Soil List Designation
At	Atkins silt loam, 0 to 3 percent slopes, frequently flooded	Poorly drained	Hydric
Ph	Philo silt loam, 0 to 3 percent slopes, occasionally flooded	Moderately well drained	Hydric inclusions

[(1)] Web Soil Survey (http://websoilsurvey.nrcs.usda.gov), accessed 6/4/2021.

CEC reviewed the NWI mapping prepared for the Ambridge, Pennsylvania topographic quadrangle to determine if any NWI wetlands are located within the delineation boundary (Figure WDR-2). One riverine (R3UBH) NWI wetland is shown within the delineation boundary and corresponds to Big Sewickley Creek.

It is noted that NWI maps have been prepared by the USFWS based on high altitude infrared aerial photography and limited ground-truthing. Wetlands and deep-water habitats are identified on these maps and classified according to the system developed by Cowardin and co-workers (1979).

2.2 ON-SITE FIELD REVIEW

2.2.1 Wetlands

No wetlands were identified within the delineation boundary during the on-site field review (Figure WDR-3). A representative test site, TS-5, was reviewed. No indicators of wetland hydrology, hydric soils, or hydrophytic vegetation were observed.

2.2.2 Streams

Two streams were identified within the delineation boundary during the on-site field review (Figure WDR-3). Table 2 presents the approximate on-site lengths and drainage areas of the streams, CEC's assignments of the stream classifications, the Chapter 93 designations, and the corresponding photograph numbers.

TABLE 2
STREAM CHARACTERISTICS

Stream Name	On-Site Length (feet)	Drainage Area (acres)	Stream Classification	Chapter 93 Designation[(1)]	Photograph Number(s) (Appendix B)
Big Sewickley Creek	594	10,877	Perennial	TSF	3 ***through 6***
North Fork Big Sewickley Creek	123	5,429	Perennial	TSF	***7***
Total	**717**				

(1) From Title 25, PA Code Chapter 93. Trout Stocking (TSF) – Maintenance of stocked trout from February 15 to July 31 and maintenance and propagation of fish species and additional flora and fauna which are indigenous to a warm water habitat.

3.0 REGULATORY CONSIDERATIONS

Based on CEC's review of the project, impacts to the on-site streams and wetland will be avoided. PER is proposing to withdraw water from Big Sewickley Creek at this location for use with unconventional gas exploration activities. A Water Use and Withdrawal Plan (WU&WP) has been prepared and submitted to the Pennsylvania Department of Environmental Protection (PADEP) in accordance with the PADEP's Water Management Plan for Unconventional Gas Well Development (8000-PM-OOGM0087).

According to the WU&WP for this location, the proposed withdrawal of water from Big Sewickley Creek will not adversely affect wetlands or the existing and designated surface water uses (TSF), or the level of water quality needed to maintain and protect these uses.

4.0 CONCLUSIONS

CEC conducted the wetland and stream delineation on May 17 and June 2, 2021*; **and January 25, 2023***. Two streams, totaling 717 linear feet, were identified within the delineation boundary during the on-site field review. The locations of these features are shown on Figure WDR-3. No wetlands were identified within the delineation boundary during the on-site field review.

5.0 LEVEL OF CARE

CEC conducted the wetland delineation in a manner consistent with the criteria contained in the 1987 Manual and 2012 Regional Supplement and with the level of care and skill ordinarily exercised by members of the environmental consulting profession practicing contemporaneously under similar conditions in the locality of the project. It must be recognized the wetland delineation was based on field observations and CEC's professional interpretation of the criteria in the 1987 Manual and the 2012 Regional Supplement at the time of our field work. Wetland determinations may change subsequent to CEC's delineation based on changes in the regulatory criteria, seasonal variations in hydrology, alterations to drainage patterns, and other human activities and/or land disturbances.

6.0 REFERENCES

Cowardin, L. M., V. Carter, and F. C. Golet. 1979. *Classification of Wetlands and Deep Water Habitats of the United States.* U.S. Department of the Interior, Fish and Wildlife Service. Washington D. C. FWS/OBS-79/31.

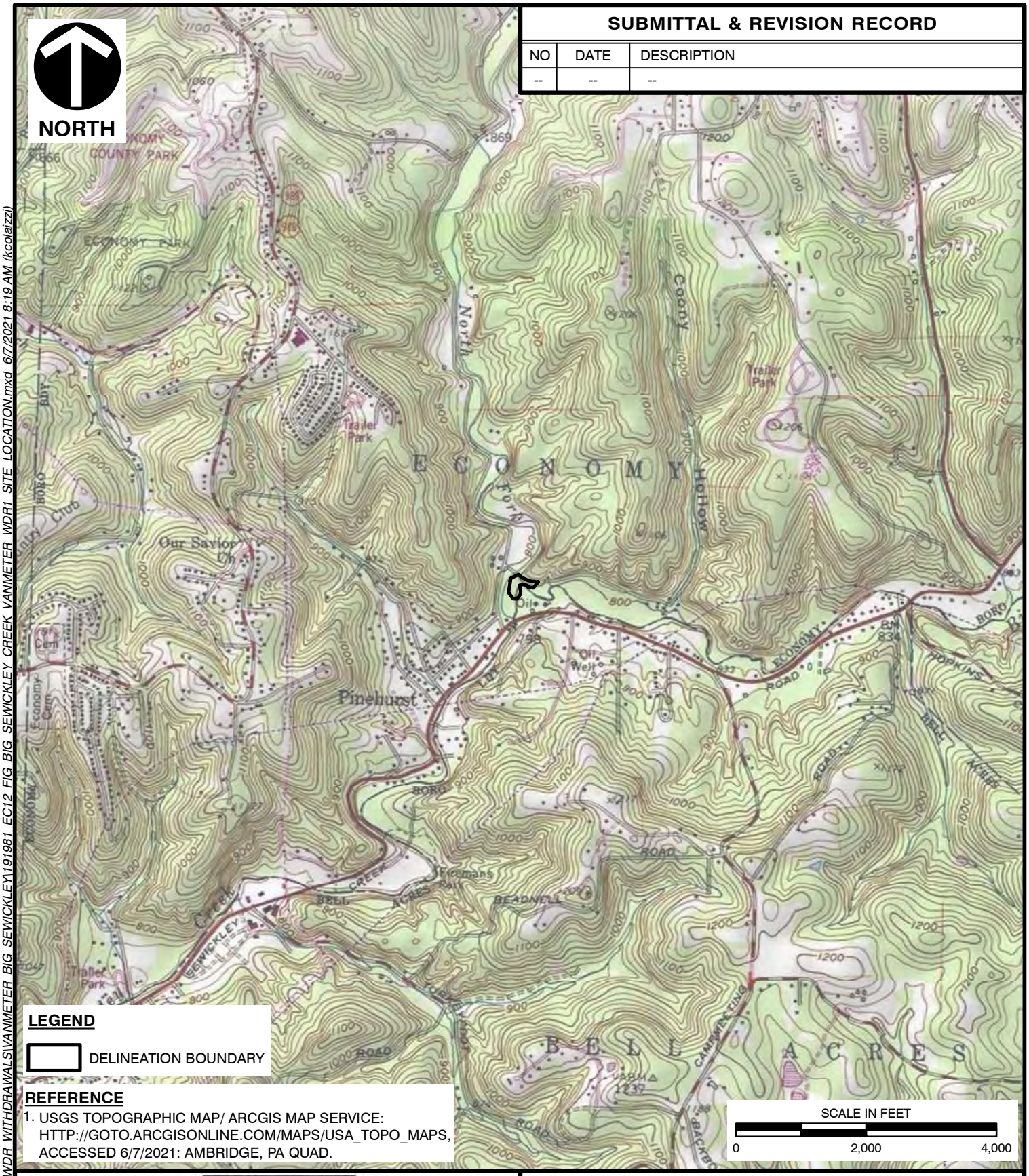
U.S. Army Corps of Engineers Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*, Technical Report Y-87-1, U.S. Army Engineer Waterway Experiment Station, Vicksburg, Mississippi.

U.S. Army Corps of Engineers. 2020. *National Wetland Plant List, Version 3.5*. http://wetland_plants.usace.army.mil. U.S. Army Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory, Hanover, NH.

Natural Resources Conservation Service (NRCS). 2012. Web Soil Survey. http://websoilsurvey.nrcs.usda.gov. (Accessed 6/4/2021).

U.S. Army Corps of Engineers. 2012. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region Version 2.0,* ERDC/EL TR-10-9, U.S. Army Engineer Research and Development Center, Vicksburg, Mississippi.

FIGURES



SUBMITTAL & REVISION RECORD

NO	DATE	DESCRIPTION
--	--	--

LEGEND

DELINEATION BOUNDARY

REFERENCE

1. USGS TOPOGRAPHIC MAP/ ARCGIS MAP SERVICE: HTTP://GOTO.ARCGISONLINE.COM/MAPS/USA_TOPO_MAPS, ACCESSED 6/7/2021: AMBRIDGE, PA QUAD.

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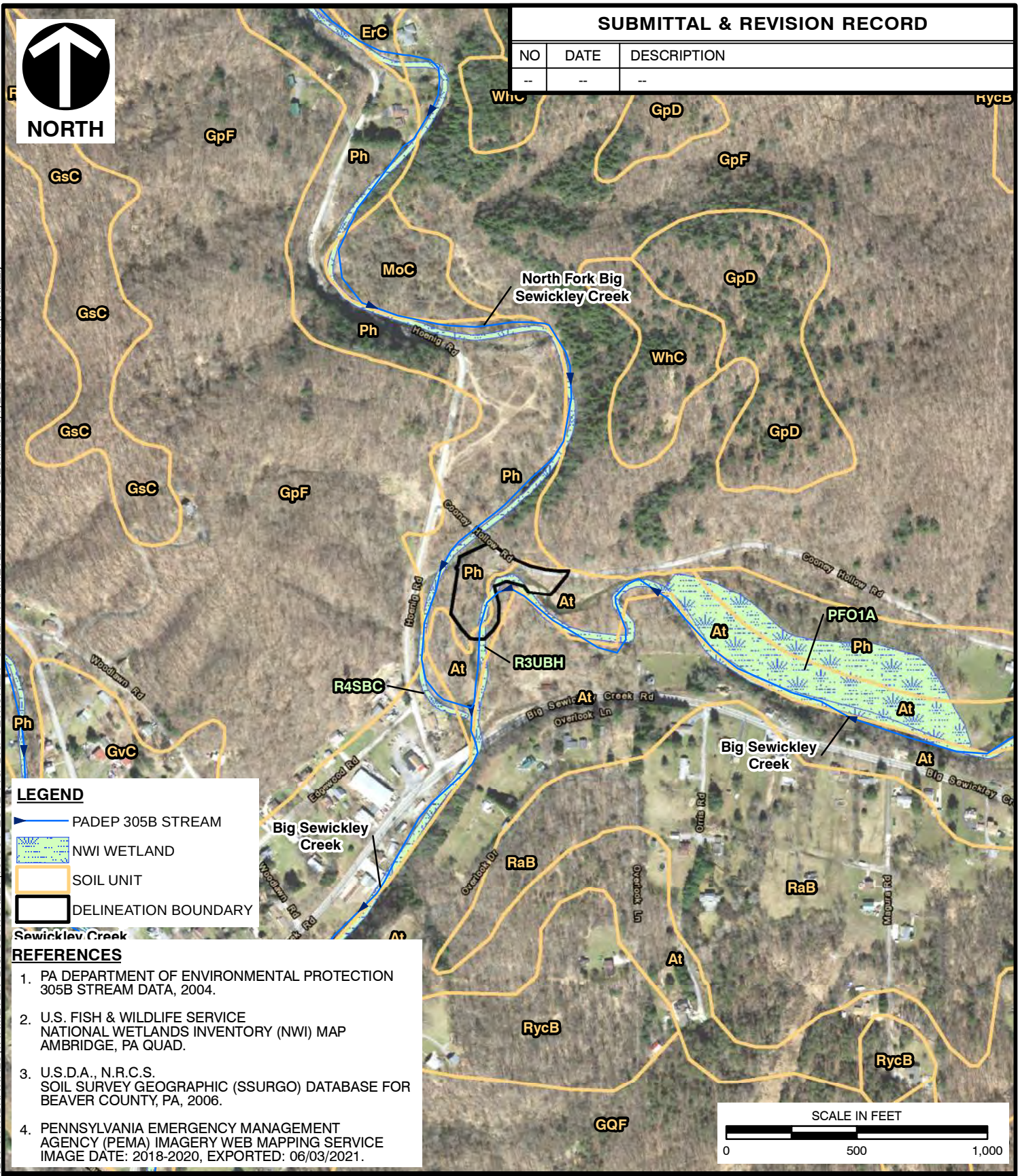
PENNENERGY RESOURCES, LLC
BIG SEWICKLEY CREEK - VANMETER
WATER WITHDRAWAL
ECONOMY BOROUGH,
BEAVER COUNTY, PENNSYLVANIA

SITE LOCATION MAP

DRAWN BY:	KMC	CHECKED BY:	SVP	APPROVED BY:	PAK*	FIGURE NO:	WDR-1
DATE:	06/07/2021	SCALE:	1 " = 2,000 '	PROJECT NO:	191-981	* Hand signature on file	

P:\2019\191-981\-GIS\Maps\EC12 WDR WITHDRAWALS\VANMETER BIG SEWICKLEY\191981 EC12 FIG BIG SEWICKLEY CREEK VANMETER WDR1 SITE LOCATION.mxd 6/7/2021 8:19 AM (kcolaizzi)



SUBMITTAL & REVISION RECORD

NO	DATE	DESCRIPTION
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LEGEND

- PADEP 305B STREAM
- NWI WETLAND
- SOIL UNIT
- DELINEATION BOUNDARY

REFERENCES

1. PA DEPARTMENT OF ENVIRONMENTAL PROTECTION 305B STREAM DATA, 2004.
2. U.S. FISH & WILDLIFE SERVICE NATIONAL WETLANDS INVENTORY (NWI) MAP AMBRIDGE, PA QUAD.
3. U.S.D.A., N.R.C.S. SOIL SURVEY GEOGRAPHIC (SSURGO) DATABASE FOR BEAVER COUNTY, PA, 2006.
4. PENNSYLVANIA EMERGENCY MANAGEMENT AGENCY (PEMA) IMAGERY WEB MAPPING SERVICE IMAGE DATE: 2018-2020, EXPORTED: 06/03/2021.

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WATER WITHDRAWAL
ECONOMY BOROUGH,
BEAVER COUNTY, PENNSYLVANIA

U.S. DEPARTMENT OF AGRICULTURE (USDA) SOILS AND NATIONAL WETLANDS INVENTORY (NWI) MAP

DRAWN BY:	KMC	CHECKED BY:	SVP	APPROVED BY:	PAK*	FIGURE NO:	WDR-2
DATE:	06/07/2021	SCALE:	1 " = 500 '	PROJECT NO:	191-981	* Hand signature on file	

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SUBMITTAL & REVISION RECORD

NO	DATE	DESCRIPTION
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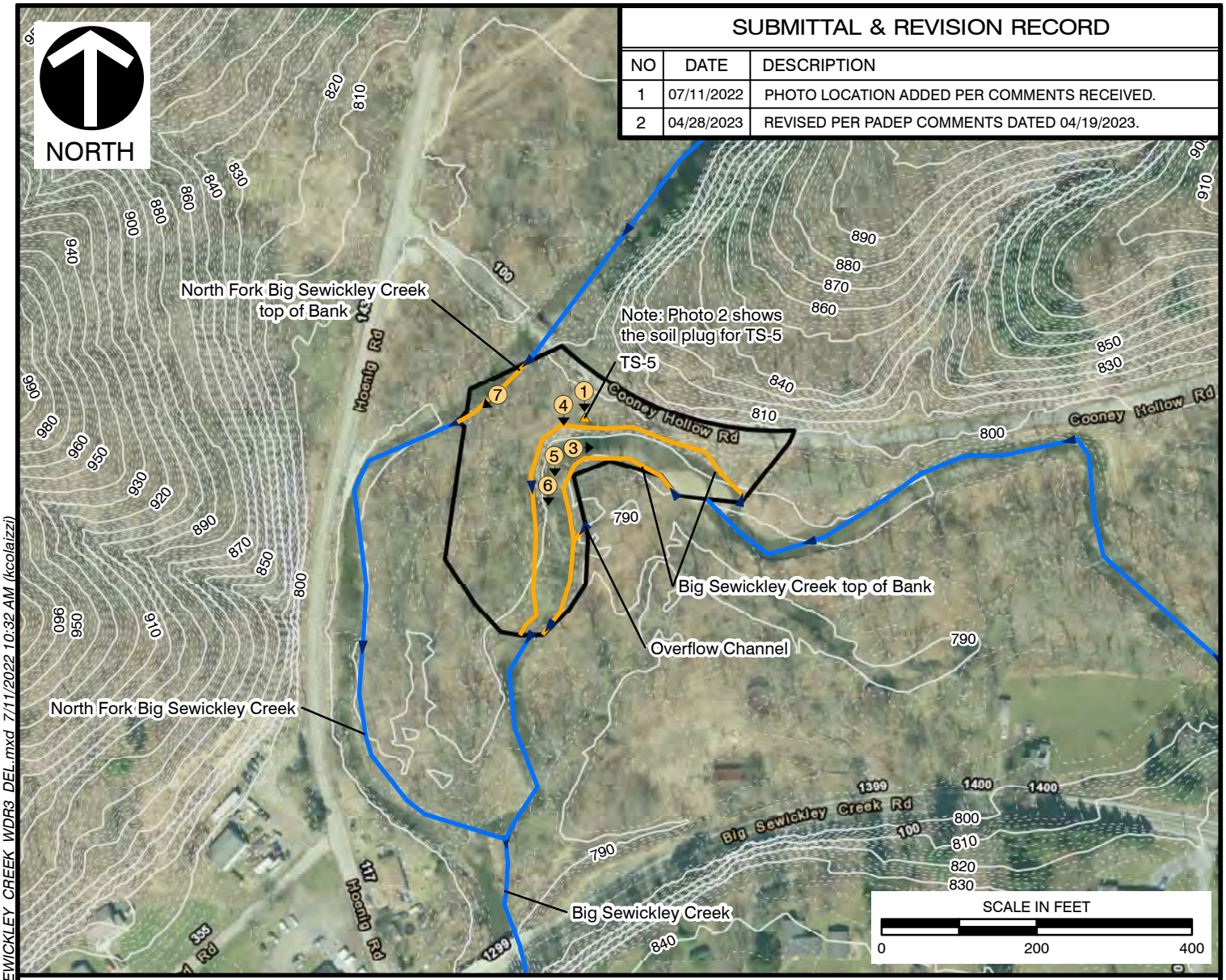
2	04/28/2023	REVISED PER PADEP COMMENTS DATED 04/19/2023.



LEGEND

- PHOTO LOCATION
- TEST SITE
- PERENNIAL STREAM
- PADEP 305B STREAM
- DELINEATION BOUNDARY
- INDEX CONTOUR
- INTERMEDIATE CONTOUR

REFERENCES

1. PA DEPARTMENT OF ENVIRONMENTAL PROTECTION 305B STREAM DATA, 2004.
2. PAMAP PROGRAM LIDAR DATA, 2' INTERVAL, 2006.
3. PENNSYLVANIA EMERGENCY MANAGEMENT AGENCY (PEMA) IMAGERY WEB MAPPING SERVICE IMAGE DATE: 2018-2020, EXPORTED: 06/03/2021.

NOTES

1. THE WETLAND AND STREAM DELINEATION WAS CONDUCTED BY CIVIL & ENVIRONMENTAL CONSULTANTS, INC. ON 05/17/2021 AND 06/02/2021.
2. CIVIL & ENVIRONMENTAL CONSULTANTS, INC. CONDUCTED THE WETLAND DELINEATION IN A MANNER CONSISTENT WITH THE CRITERIA CONTAINED IN THE 1987 U.S. ARMY CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL (1987 MANUAL) AND THE 2012 REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: EASTERN MOUNTAINS AND PIEDMONT REGION, VERSION 2.0 (2012 REGIONAL SUPPLEMENT), AND WITH THE LEVEL OF CARE AND SKILL ORDINARILY EXERCISED BY MEMBERS OF THE ENVIRONMENTAL CONSULTING PROFESSION PRACTICING CONTEMPORANEOUSLY UNDER SIMILAR CONDITIONS IN THE LOCALITY OF THE PROJECT. IT MUST BE RECOGNIZEDTHE WETLAND DELINEATION WAS BASED ON FIELD OBSERVATIONS AND CIVIL & ENVIRONMENTAL CONSULTANTS' PROFESSIONAL INTERPRETATION OF THE CRITERIA IN THE 1987 MANUAL AND THE 2012 REGIONAL SUPPLEMENT. WETLAND DETERMINATIONS MAY CHANGE SUBSEQUENT TO CIVIL & ENVIRONMENTAL CONSULTANTS' DELINEATION BASED ON CHANGES TO REGULATORY CRITERIA, CHANGES TO DRAINAGE, AND OTHER HUMAN ACTIVITIES AND/OR LAND DISTURBANCES.

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PENNENERGY RESOURCES, LLC
BIG SEWICKLEY CREEK
WATER WITHDRAWAL
ECONOMY BOROUGH,
BEAVER COUNTY, PENNSYLVANIA

WETLAND AND STREAM DELINEATION MAP

DRAWN BY:	KMC	CHECKED BY:	SVP	APPROVED BY:	PAK*	FIGURE NO:	WDR-3
DATE:	06/09/2021	SCALE:	1 " = 200 '	PROJECT NO:	191-981	* Hand signature on file	

P:\310-000\317-457\-GIS\Maps\EC03 WDR BIG SEWICKLEY CREEK\191981 EC12 FIG BIG SEWICKLEY CREEK WDR3 DEL.mxd 7/11/2022 10:32 AM (kcolaizzi)

APPENDIX A

COMPLETED DATA FORMS

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont

191-981

Project/Site: Big Sewickley Creek - VanMeter Water Withdrawal City/County: Beaver County Sampling Date: May 17, 2021

Applicant/Owner: PennEnergy Resources, LLC State: PA Sampling Point: TS-5

Investigator(s): DWL, ARS Section, Township, Range: Economy Borough

Landform (hillslope, terrace, etc.): Floodplain Local Relief (concave, convex, none): Concave Slope (%):

Subregion (LRR or MLRA): LRR N Lat: 40.609572 Long: -80.180178 Datum: NAD 83

Soil Map Unit Name: Ph - Philo silt loam, 0 to 3 percent, occasionally flooded NWI classification: N/A

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No X			
Hydric Soil Present?	Yes	No X	Is the Sampled Area within a Wetland?	Yes	No X
Wetland Hydrology Present?	Yes	No X		Upland	

Remarks:

Representative upland test site at a proposed water withdrawal location along the bank of Big Sewickley Creek.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

Surface Water (A1)	True Aquatic Plants (B14)	
High Water Table (A2)	Hydrogen Sulfide Odor (C1)	
Saturation (A3)	Oxidized Rhizospheres on Living Roots (C3)	
Water Marks (B1)	Presence of Reduced Iron (C4)	
Sediment Deposits (B2)	Recent Iron Reduction in Tilled Soils (C6)	
Drift Deposits (B3)	Thin Muck Surface (C7)	
Algal Mat or Crust (B4)	Other (Explain in Remarks)	
Iron Deposits (B5)		
Inundation Visible on Aerial Imagery (B7)		
Water-Stained Leaves (B9)		
Aquatic Fauna (B13)		

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- Sparsely Vegetated Concave Surface (B8)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Mircotopographic Relief (D4)
- FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	No X	Depth (inches):	
Water Table Present?	Yes	No X	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes	No X	Depth (inches):	

Wetland Hydrology Present? Yes No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Five Strata) - Use scientific names of plants. Sampling Point: TS-5

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0	= Total Cover	

Sapling Stratum: (Plot Size: 15)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0	= Total Cover	

Shrub Stratum: (Plot Size: 15)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0	= Total Cover	

Herb Stratum: (Plot size: 5)			
1. *Fallopia japonica*	45	Y	FACU
2. *Rumex obtusifolius*	10	N	FACU
3. *Taraxacum officinale*	10	N	FACU
4. *Lamium purpureum*	5	N	UPL
5. *Stellaria media*	5	N	UPL
6 *Glechoma hederacea*	15	Y	FACU
7. *Plantago major*	5	N	FACU
8. *Hydrophyllum canadense*	5	N	FACU
9.			
10.			
11.			
12.			
	100	= Total Cover	

Woody Vine Stratum: (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling - Woody plants, excluding woody vines, aproximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody plants, excluding woody vines, aproximately 3 to 20 ft (1 to 6 m) in height.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vines - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: TS-5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 4/2	100					Clay Loam	with gravel

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL= Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147,148)**
- ___ Thin Dark Surface (S9) **(MLRA147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: 5

Depth (inches): Rock

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

STREAM SURVEY DATA COLLECTION FORM

PROJECT 317-457
DATE 1/25/23
STREAM FIELD ID Stream 3
STREAM NAME Big Sewickley Creek
REVIEWER(S) DWE, ARS

Weather Conditions: ☒ Sunny ☐ Partly Cloudy ☐ Cloudy ☐ Rain
Any precipitation in the last 5 days? ☐ Yes ☒ No

Stream Type: ☒ Perennial ☐ Intermittent ☐ Ephemeral

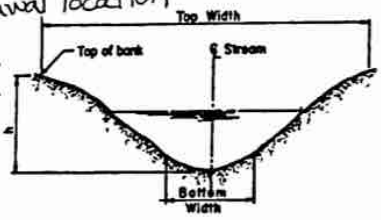
☒ Photographs taken Photograph numbers: 43 upstream 44 downstream ___ crossing
☒ Flagged (_____ total flags)
☒ GPS coordinates collected

Stream crossed/encroached by centerline or limit of disturbance:
☐ Yes ☒ No Crossing length _____ feet
Road crossing and type:
☐ Bridge ☐ Ford crossing ☐ Culvert (Diameter: ___)

Hydrological Characteristics:

Tributary is: ☒ Natural.
☐ Artificial (man-made). Explain:
☐ Manipulated (man-altered). Explain (rip/rap, gabions, stream channelized, filled, or truncated):

Stream channel properties with respect to top of bank (estimate): @withdrawal location
Average top of bank width (feet): 30-50' At centerline: 50'
Average top of bank depth (feet): 4-8' At centerline: 8'
Wetted width (feet): 20-35' At centerline: 35'
Wetted depth (feet): 1-4' At centerline: 4'
Average side slopes: Vertical (1:1 or less); 2:1; 3:1; 4:1 or more
Ordinary High Water Mark (OHWM), if observed:



Primary tributary substrate composition (check all that apply):

X Silt	X Gravel (0.25" to 2")	_____ Bedrock
X Sand	X Cobble (2" to 10")	_____ Vegetation (_____%)
_____ Clay	X Boulder (>10")	_____ Other. Explain:

Flow Characteristics:

Water present: ☐ No water, streambed dry ☐ Streambed moist ☐ Standing water ☒ Flowing water
If flow present, estimate stage at time of survey: ☐ High ☒ Normal ☐ Low
Bank erosion: ☒ Extensive ☐ Moderate ☐ Little / None

Tributary has (check all that apply): ☒ Defined bed and banks ☐ Poorly defined bed and banks

Water Quality Characteristics

General watershed or riparian area characteristics: (Roadside)
☒ forested ☐ open field ☐ farmland ☐ wetland ☒ mixed use ☐ industrial ☐ mining ☐ residential

Stream Shading: ☐ 75 - 100% ☐ 50 - 74% ☐ 25 - 49% ☒ 0 - 24%
Wetland fringe: ☐ Yes (☐ Abutting or ☐ Adjacent) ☒ No
Wetland ID:

Biological Characteristics:

Macroinvertebrates observed? ☒ Yes ☐ No Describe: Caddisflies
Fish or wildlife observed? ☐ Yes ☒ No Describe:

Other Observations and Comments:

Stream flows through a forested valley and continues both upstream and downstream of the delineation boundary. The proposed water withdrawal location is near a pull off just south of Cooney Hollow Road. The max pool depth is approximately 4' and the substrate is predominantly cobble and gravel.

STREAM SURVEY DATA COLLECTION FORM

Big Sewickley Creek - VanMeter Water Withdrawal

PROJECT 191981

DATE 6/2/21

STREAM FIELD ID STREAM 2 SOUTH (adjacent to Big Sewickley Creek proposed withdrawal location)

STREAM NAME NORTH FORK BIG SEWICKLEY CREEK

REVIEWER(S) CRR, DWL

Weather Conditions: ☐ Sunny ☐ Partly Cloudy ☑ Cloudy ☐ Rain

Any precipitation in the last 5 days? ☑ Yes ☐ No

Stream Type: ☑ Perennial ☐ Intermittent ☐ Ephemeral

☒ Photographs taken Photograph numbers: ___ upstream ___ downstream ___ crossing

☐ Flagged (_____ total flags)

☒ GPS coordinates collected

Stream crossed/encroached by centerline or limit of disturbance: ☐ Yes ☐ No Crossing length _____ feet

Road crossing and type: ☐ Bridge ☐ Ford crossing ☐ Culvert (Diameter: ___)

Hydrological Characteristics:

Tributary is: ☑ Natural.

☐ Artificial (man-made). Explain:

☐ Manipulated (man-altered). Explain (rip/rap, gabions, stream channelized, filled, or truncated):

Stream channel properties with respect to top of bank (estimate):

Average top of bank width (feet): 20-35 At centerline: -

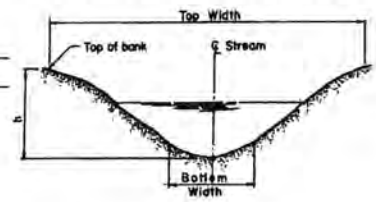
Average top of bank depth (feet): 2-5 At centerline: -

Wetted width (feet): 10-20 At centerline: -

Wetted depth ([redacted]): 1-12 in. At centerline: -

Average side slopes: Vertical (1:1 or less); 2:1; 3:1; 4:1 or more

Ordinary High Water Mark (OHWM), if observed:



Primary tributary substrate composition (check all that apply):

✓ Silt ✓ Gravel (0.25" to 2") _____ Bedrock

✓ Sand ✓ Cobble (2" to 10") _____ Vegetation (_____%)

_____ Clay ✓ Boulder (>10") _____ Other. Explain:

Flow Characteristics:

Water present: ☐ No water, streambed dry ☐ Streambed moist ☐ Standing water ☑ Flowing water

If flow present, estimate stage at time of survey: ☐ High ☑ Normal ☐ Low

Bank erosion: ☐ Extensive ☐ Moderate ☑ Little / None

Tributary has (check all that apply): ☑ Defined bed and banks ☐ Poorly defined bed and banks

Water Quality Characteristics

General watershed or riparian area characteristics:

☑ forested ☐ open field ☐ farmland ☐ wetland ☐ mixed use ☐ industrial ☐ mining ☐ residential

Stream Shading: ☐ 75 - 100% ☑ 50 - 74% ☐ 25 - 49% ☐ 0 - 24%

Wetland fringe: ☐ Yes (☐ Abutting or ☐ Adjacent) ☑ No

Wetland ID:

Biological Characteristics:

Macroinvertebrates observed? ☑ Yes ☐ No Describe: STONEFLY, CADDIS, MAYFLY, WATER PENNY

Fish or wildlife observed? ☑ Yes ☐ No Describe: MALLARDS, FISH

Other Observations and Comments:

CONFLUENCES WITH Big Sewickley Creek OUTSIDE BOUNDARY

APPENDIX B

PHOTOGRAPHS

PHOTOGRAPHS
BIG SEWICKLEY CREEK - WATER WITHDRAWAL
PENNENERGY RESOURCES, LLC

Photo 1: Test Site 5, non-wetland.
Facing south - May 17, 2021

Photo 2: Test Site 5, soil plug.
May 17, 2021

Photo 3: Big Sewickley Creek.
Facing upstream - May 17, 2021

Photo 4: Big Sewickley Creek.
Facing downstream - May 17, 2021

Photo 5: Big Sewickley Creek - Withdrawal Location.
Facing downstream - April 27, 2023

Photo 6: Big Sewickley Creek - Withdrawal Location.
Facing downstream - April 27, 2023

PHOTOGRAPHS
BIG SEWICKLEY CREEK - WATER WITHDRAWAL
PENNENERGY RESOURCES, LLC

Photo *7*: North Fork Big Sewickley Creek.
Facing downstream - June 2, 2021

Attachment L

Reuse Plan

WASTEWATER SOURCE REDUCTION STRATEGY

1000 Commerce Drive
Park Place One
Suite 100
Pittsburgh, PA 15275

(412) 275-3200

Revision Date
January 2, 2019

PennEnergy Resources, LLC
Wastewater Source Reduction Strategy

PennEnergy Resources, LLC (PennEnergy) intends to utilize this Wastewater Source Reduction Strategy (Reuse Plan) for their fracturing, production, exploration, drilling and completion operations of natural gas wells located in western Pennsylvania. This plan identifies the methods and procedures used in attempt to maximize the recycling and reuse of flowback water and production fluids per 25 Pa Code Chapter 95.10(b).

No wastewater will be discharged into waters of the Commonwealth from any source associated with fracturing, production, field exploration, drilling or completion of a natural gas well without first obtaining a National Pollutant Discharge Elimination System (NPDES) permit, authorized by the PADEP under 25 Pa Code Chapter 92 and will comply with the requirement set forth in 25 Pa Code Chapter 95 Section 10 Subsection b(3).

PennEnergy will complete a characterization of their wastewater streams including chemical analyses, Total Dissolved Solids (TDS) concentrations and monthly generation rate of flowback and production fluid at each natural gas well.

When possible, PennEnergy will recycle and reuse flowback and production water for use on subsequent fracturing and completion operations or for other beneficial uses approved under Chapter 287. When feasible, PennEnergy will utilize flowback and production water that has been treated and supplied by a third part contactor for use in their natural gas operations. These third party contactors include but are not limited to the following; Reserve Environmental Services, LLC, 1090 Freeport Road, Suite 2, Pittsburgh, Pennsylvania; (412) 784-3399. PennEnergy intends to recycle and reuse flowback and production water in order to reduce the amount of fresh water used in their natural gas operations.

PennEnergy will quantify the amount of flowback and production fluid generated by each well which has been recycled or reused in fracturing other gas wells or for other beneficial uses approved under Chapter 287.

PennEnergy will conduct annual reviews of this reuse plan and update as needed. This reuse plan will be available to the Pennsylvania Department of Environmental Protection (PADEP) upon request.