pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0092355**
Facility Type	**Municipal**	APS ID	**845775**
Major / Minor	**Minor**	Authorization ID	**1362634**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Belle Vernon Municipal Authority**	Facility Name	**Belle Vernon Municipal Authority STP**
Applicant Address	10 Main Street PO Box 181	Facility Address	10 Main Street
	Belle Vernon, PA 15012-0181		Belle Vernon, PA 15012
Applicant Contact	Guy Kruppa	Facility Contact	Guy Kruppa
Applicant Phone	(724) 929-8138	Facility Phone	(724) 929-8138
Client ID	37841	Site ID	254630
Ch 94 Load Status	Not Overloaded	Municipality	Belle Vernon Borough
Connection Status		County	Fayette
Date Application Received	June 30, 2021	EPA Waived?	Yes
Date Application Accepted	September 7, 2021	If No, Reason	
Purpose of Application	NPDES permit renewal application.		

Summary of Review

The PA Department of Environmental Protection (PADEP/Department) received an NPDES permit renewal application from KLH Engineers, Inc. (Consultant) on June 30, 2021 on behalf of Belle Vernon Municipal Authority (Permittee) for permittee's Belle Vernon Municipal Authority STP (facility). The facility a minor STP with an average annual design flow of 0.95 MGD, Hydraulic design capacity of 0.95 MGD, and organic loading capacity of 1,615 lbs. BOD5/day. The treated effluent is discharged through Outfall 001 into Monongahela River (WWF) at RMI 43.3 in state watershed 19-C. The existing permit will expire on December 31, 2021. The terms and conditions of the existing permit were automatically extended since the renewal application was received at least 180 days prior to expiration date. Renewal NPDES permit applications under Clean Water program are not covered by PADEP's PDG per 021-2100-001.

This fact sheet is developed in accordance with 40 CFR §124.56.

Changes in this renewal: Quarterly E. Coli monitoring added, minimum DO limit is changed to 5.0 mg/l, UV dosage monitoring is updated to UV transmittance monitoring.

Sludge use and disposal description and location(s): Dewatered sludge is landfilled.

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
√		Reza H. Chowdhury, E.I.T. / Project Manager	September 14, 2021
√		Pravin C. Patel, P.E. / Environmental Engineer Manager /s/	September 20, 2021

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.95
Latitude	40º 7' 39"	Longitude	-79º 52' 32"
Quad Name	California	Quad Code	1806
Wastewater Description:	Sewage Effluent		
Receiving Waters	Monongahela River (WWF)	Stream Code	37185
NHD Com ID	99410080	RMI	43.78
Drainage Area	5,190 mi^2	Yield (cfs/mi^2)	0.08
Q_{7-10} Flow (cfs)	132.0	Q_{7-10} Basis	Please see below
Elevation (ft)	743.66	Slope (ft/ft)	
Watershed No.	19-C	Chapter 93 Class.	WWF
Existing Use	**WWF**	Existing Use Qualifier	Ch. 93
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)	7.7	WQN0702, median Jul-Sep 1999-2019
Temperature (°C)	25	WQN0702, median Jul-Sep 1999-2018
Hardness (mg/L)	116	WQN0702, median Jul-Sep 1999-2019
Other:		

Nearest Downstream Public Water Supply Intake		Charleroi Borough Municipal Authority	
PWS Waters	Monongahela River	Flow at Intake (cfs)	
PWS RMI	43.02	Distance from Outfall (mi)	0.76

Changes Since Last Permit Issuance: None

Other Comments:

Streamflow:

Streamflow will be correlated with the USGS's web-based GIS application (https://streamstats.usgs.gov/ss/) accessed on September 7, 2021. Q_{7-10} and Q_{30-10} values at Outfall 001 were found to be 400 cfs and 468 cfs respectively. The drainage area at Outfall 001 was found to be 5,190 mi^2 from StreamStats.

Q_{7-10} runoff rate = 400 cfs/ 5190 mi^2 = 0.08 cfs/mi^2
Q_{30-10}/Q_{7-10} = 468 cfs/400 cfs = 1.17
Default Q_{1-10}: Q_{7-10} of 0.64 from 391-2000-007 will be used in modeling, if needed.

DEP's SOP (BPMPSM-PMT-033, revised Oct 1, 2020) section II.B.4 states that where a facility is eligible for technology-based limits of $CBOD_5$ exceeding 25 mg/l, application managers will evaluate a WQBEL for $CBOD_5$ as follows:

a. *Model the discharge using Toxics Management Spreadsheet (TMS)*
b. *Multiply the acute partial mix factor by the Q_{7-10} of the receiving waters*
c. *Run the WQM 7.0 model using the adjusted Q_{7-10} and apply the WQBEL in the permit, if less than the technology-based limits*

d. Establish the average monthly concentration limit for TSS at the same concentration as for $CBOD_5$ using BPJ, if the $CBOD_5$ limit is a WQBEL

The TMS model suggested a PMFa of 3.5%. A partial mixing factor, according to DEP's technical guidance (391-2000-011), is used to describe the factional portion of the stream that mixes with the discharge at the criteria compliance times. The partial mix factor is a value between 0 and 1; 1 presenting complete mixing and less than 1 represents there is incomplete mixing between the discharge and the stream. U.S. EPA's NPDES Permit Writers Manual (EPA Doc ID: EPA-833-K-10-001) stated that dilution can't be more than 1/3rd of the critical low flow. Considering both aspects, the permit writer decided to use 1/3rd of Q_{7-10} as available dilution. Therefore, the revised Q_{7-10} will be **400 * 0.33 or 132.0 cfs**.

PWS Intake:
The nearest downstream public water supply is Charleroi Borough Municipal Authority, on Monongahela River at RMI 43.02. Its approximately 0.76 miles downstream of Outfall 001.

Wastewater Characteristics:
A median pH of 6.9 S.U. from daily DMR during July-August 2021 and September 2020 and a default temperature of 20^0C (per 391-2000-013) will be used for modeling, if needed.

Background data:
Background stream data was collected from WQN0702. The median pH for July-September from 1999-2019 is 7.7 S.U., median temperature for July-September 1999-2018 is 25°C, and median hardness for July-September from 1999-2019 is 116 mg/l.

303d Listed Streams:
The receiving stream is not attaining its Fish Consumption designated use due to PCBs from unknown source. Monongahela River TMDL was finalized in April 9, 2001 after collecting edible portion of fish tissues. There is no WLA in the TMDL, all loads were assigned to non-point sources or LA.

Antidegradation (93.4):
The effluent limits for this discharge have been developed to ensure that existing in-stream water uses and the level of water quality necessary to protect the existing uses are maintained and protected. The receiving streams are designated as Warm Water Fishes (WWF). No High-Quality stream or Exceptional Value water is impacted by this discharge; therefore, no Antidegradation Analysis is performed for the discharge.

Treatment Facility Summary

Treatment Facility Name: Belle Vernon STP

WQM Permit No.	Issuance Date
465S23-A1	12/21/2008
465S23	8/23/2007

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary	Contact Stabilization	UV	0.95

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.95	1,615	Not Overloaded	Centrifugation	Landfill

Changes Since Last Permit Issuance: None

Treatment Plant Description

Belle Vernon MA is a 0.95 MGD Minor Sewer Facility (MISF2) located in Belle Vernon Borough, Fayette County which discharges treated sewage through outfall 001 into Monongahela River in watershed 19-C. This a contact stabilization UV disinfection system. The treatment plant consists of influent bar screening, contact tanks, RAS returned through the re-aeration and contact tanks, final clarifiers, and UV disinfection. Sludge treated by an aerobic digester, sludge concentration tank, and dewatering by a centrifuge. Supernatant and filtrate returned to the influent tank.

The flow contributions to the treatment facility are listed below:

Municipalities served	Flow contribution (%)	Type of Sewer System	
		Separate (%)	Combined (%)
Belle Vernon Borough, Fayette Co	20	95*	5*
Washington Township, Fayette Co	40	100	0
North Belle Vernon, Westmoreland Co	<0.5	100	0

* The facility completed separation of its sewage from stormwater and has no active CSO outfall. The consultant confirmed via email that all flows to the facility is 100% separate.

Per the renewal application, there is no significant or categorical industrial facility that discharges into the collection system.

Per PADEP's inspection on June 14, 2017, the treatment train consists of the following treatment units:

- One bar screen
- Two primary clarifiers
- Two aeration tanks
- Two digesters
- Two return lines
- One centrifuge
- Two UV disinfection trains
- Two influent flow meters

50% H_2O_2 is used for odor control, injected into force main at a rate of 1.0 gal/hr.

Biosolids Management:
Sludge is treated by an aerobic digester, sludge holding tank, and dewatered by a centrifuge. Dewatered sludge is landfilled in Kelly Run Landfill and USA South Hills Landfill operated by Waste Management. In 2020, a total of 66.1 dry tons of sludge was landfilled.

Summary of Inspection:
10/19/2017: RTPT conducted. The facility was checked during a boat patrol in Pool #4 of the Monongahela River. The effluent appeared clear and sheen free.

06/14/2017: CEI conducted. No violation identified during the inspection.

Compliance History

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

Parameter	JUL-21	JUN-21	MAY-21	APR-21	MAR-21	FEB-21	JAN-21	DEC-20	NOV-20	OCT-20	SEP-20	AUG-20
Flow (MGD) Average Monthly	0.453	0.228	0.488	0.418	0.585	0.601	0.485	0.563	0.261	0.407	0.394	0.401
Flow (MGD) Daily Maximum	1.11	1.35	1.41	0.855	1.17	2.3	1.75	1.73	1.05	1.40	0.899	1.2
pH (S.U.) Minimum	6.8	6.7	6.9	6.7	6.8	6.8	6.7	6.9	7.0	6.8	6.8	6.8
pH (S.U.) Maximum	7.2	6.9	7.2	7.1	7.1	7.1	6.9	7.1	7.1	7.1	7.2	7.1
DO (mg/L) Minimum	5.5	6.9	6.5	6.6	6.8	6.0	6.0	8.5	8.4	6.6	6.5	6.4
CBOD5 (lbs./day) Average Monthly	32.9	16.5	37.7	12.7	35.1	58.2	33.59	15.5	8.7	13.2	9.86	10.0
CBOD5 (lbs/day) Weekly Average	36.3	22.8	57.0	16.5	67.8	71.7	87.4	18.8	10.9	19.3	16.4	10.0
CBOD5 (mg/L) Average Monthly	8.7	8.7	9.26	3.7	7.2	11.6	8.3	3.3	4.0	3.9	3.0	3.0
CBOD5 (mg/L) Weekly Average	9.6	12.0	14.0	4.73	13.9	14.3	21.6	4.0	5.0	5.7	5.0	3.0
BOD5 (lbs/day) Influent Average Monthly	432.8	393.2	630.4	784.8	883.6	458.9	518.1	138.0	285.3	563.1	499.4	528.7
BOD5 (lbs/day) Influent Weekly Average	521.7	922.7	810.4	976.7	1254.6	687.1	708.3	1221.5	461.7	679.2	647.7	585.6
BOD5 (mg/L) Influent Average Monthly	114.5	206.7	154.8	225.0	181.0	91.5	128.0	138.0	131.0	165.8	151.9	158.0
BOD5 (mg/L) Influent Weekly Average	138.0	485.0	199.0	280.0	257.0	137.0	175.0	260.0	212.0	200.0	197.0	175.0
TSS (lbs/day) Average Monthly	44.6	15.6	32.6	19.2	62.4	112.8	78.1	24.9	10.9	32.2	83.2	35.1
TSS (lbs/day) Influent Average Monthly	207.9	171.8	348.2	455.2	475.4	247.3	720.4	639.0	228.7	533.2	443.8	371.4
TSS (lbs/day) Influent Weekly Average	279.7	270.1	594.6	572.1	810.3	431.3	1999.4	1014.8	466.1	1100.4	670.7	414.9

TSS (lbs/day) Weekly Average	86.9	22.8	44.8	24.4	87.8	140.4	149.8	28.2	15.2	67.9	131.5	53.5
TSS (mg/L) Average Monthly	11.8	8.25	8.0	5.5	12.8	22.5	19.3	5.3	5.0	9.5	25.3	10.5
TSS (mg/L) Influent Average Monthly	55.0	90.3	85.5	130.5	97.4	49.3	178.0	136.0	105.0	157.0	135.0	111.0
TSS (mg/L) Influent Weekly Average	74.0	142.0	146.0	164.0	166.0	86.0	494.0	216.0	214.0	324.0	204.0	124.0
TSS (mg/L) Weekly Average	23.0	12.0	11.0	7.0	18.0	28.0	37.0	6.0	7.0	20.0	40.0	16.0
Fecal Coliform (No./100 ml) Geometric Mean	10.0	7.85	5.0	10.0	5.0	5.8	10.0	645.0	1584.0	346.7	128.0	29.8
UV Transmittance (%) Average Monthly	95.0	88.0	88.0	85.0	89.0	85.0	88.0	88.0	85.0	88.0	90.0	85.0
UV Transmittance (%) Weekly Average	90.0	95.0	94.0	90.0	95.0	91.0	90.0	90.0	90.0	92.5	95.0	95.0
Total Nitrogen (mg/L) Daily Maximum		19.7			3.1			3.1			3.3	
Ammonia (lbs/day) Average Monthly	21.9	17.1	56.2	46.7	51.2	27.6	14.6	8.5	1.74	2.7	2.6	2.7
Ammonia (mg/L) Average Monthly	5.8	9.01	13.8	13.4	10.5	5.5	3.6	1.8	0.8	0.8	0.8	0.8
Total Phosphorus (mg/L) Daily Maximum		2.7			0.13			0.42			0.35	

Compliance history: No DMR violation reported during last 12 months.

Existing Limits

The table below summarizes effluent limitations and monitoring requirements specified in the existing final NPDES permit that was in effect between January 1, 2017 to December 31, 2021.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Recorded
pH (S.U.)	XXX	XXX	6.0	XXX	9.0 Max	XXX	1/day	Grab
Dissolved Oxygen	XXX	XXX	4.0	XXX	XXX	XXX	1/day	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	198	297	XXX	25	37.5	50	1/week	8-Hr Composite
Biochemical Oxygen Demand (BOD5) Influent	Report	Report	XXX	Report	Report	XXX	1/week	8-Hr Composite
Total Suspended Solids Influent	Report	Report	XXX	Report	Report	XXX	1/week	8-Hr Composite
Total Suspended Solids	237	357	XXX	30	45	60	1/week	8-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	1/week	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/week	Grab
Total Nitrogen	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/quarter	8-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	Report	XXX	XXX	Report	XXX	XXX	1/week	8-Hr Composite
Ammonia-Nitrogen May 1 - Oct 31	198	XXX	XXX	25	XXX	50	1/week	8-Hr Composite
Total Phosphorus	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/quarter	8-Hr Composite
Ultraviolet light dosage (%)	XXX	XXX	XXX	Report	Report	XXX	1/day	Measured

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** .95
Latitude 40º 7' 39" **Longitude** -79º 52' 32"
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)
Total Suspended Solids	30	Average Monthly	133.102(b)(1)	92a.47(a)(1)
	45	Average Weekly	133.102(b)(2)	92a.47(a)(2)
pH	6.0 – 9.0 S.U.	Min – Max	133.102(c)	95.2(1)
Fecal Coliform (5/1 – 9/30)	200 / 100 ml	Geo Mean	-	92a.47(a)(4)
Fecal Coliform (5/1 – 9/30)	1,000 / 100 ml	IMAX	-	92a.47(a)(4)
Fecal Coliform (10/1 – 4/30)	2,000 / 100 ml	Geo Mean	-	92a.47(a)(5)
Fecal Coliform (10/1 – 4/30)	10,000 / 100 ml	IMAX	-	92a.47(a)(5)
Total Residual Chlorine	0.5	Average Monthly	-	92a.48(b)(2)

Comments: These standards apply, subject to Water Quality Analysis and BPJ where applicable.

Water Quality-Based Limitations

WQM 7.0:

WQM 7.0 version 1.0b is a water quality model designed to assist DEP to determine appropriate effluent limits for $CBOD_5$, NH_3-N and DO. The model simulates two basic processes. In the NH_3-N module, the model simulates the mixing and degradation of NH_3-N in the stream and compares calculated instream NH_3-N concentrations to NH_3-N water quality criteria. In the D.O. module, the model simulates the mixing and consumption of D.O. in the stream due to the degradation of $CBOD_5$ and NH_3N and compares calculated instream D.O. concentrations to D.O. water quality criteria. Since WQM 7.0 assumes immediate and complete mix between the discharge and stream flow, Q_{7-10} was adjusted, as shown on page 3, to examine allowable wasteload allocations under appropriate mixing conditions. The model was utilized for this permit renewal by using adjusted Q_{7-10} and historic background water quality levels of the river, if available. The following data were used in the attached computer model of the stream:

- Discharge pH 6.9 (median Jul-Aug 2021, Sep 2020 DMR data)
- Discharge Temperature 20°C (Default per 391-2000-013)
- Discharge Hardness 100 mg/l (Default)
- Stream pH 7.7 (median WQN0702, Jul-Sep 1999-2019)
- Stream Temperature 25°C (median WQN0702, Jul-Sep 1999-2018)
- Stream Hardness 116 mg/l (median WQN0702, Jul-Sep 1999-2019)

The following nodes were considered in modeling:

Node 1: Belle Vernon MA Outfall 001 at Monongahela River (037185)
Elevation: 743.66 ft (USGS National Map viewer, 09/07/2021)
Drainage Area: 5190 mi^2 (StreamStats Version 3.0, 09/07/2021)
River Mile Index: 43.78 (PA DEP eMapPA)
Low Flow Yield: 0.08 cfs/mi^2
Discharge Flow: 0.95 MGD

Node 2: At confluence with Speers Run (039817) at Monongahela River RMI 43.72

	Elevation:	743.6 ft (USGS National Map viewer, 09/07/2021)
	Drainage Area:	5200 mi^2 (StreamStat Version 3.0, 09/07/2021)
	River Mile Index:	43.72 (PA DEP eMapPA)
	Low Flow Yield:	0.08 cfs/mi^2
	Discharge Flow:	0.0 MGD
Node 3:	At confluence with Maple Creek (039806) at Monongahela River RMI 42.94	
	Elevation:	743.32 ft (USGS National Map viewer, 09/07/2021)
	Drainage Area:	5210 mi^2 (StreamStat Version 3.0, 09/07/2021)
	River Mile Index:	42.94 (PA DEP eMapPA)
	Low Flow Yield:	0.08 cfs/mi^2
	Discharge Flow:	0.0 MGD

NH_3-N:
WQM 7.0 suggested NH_3-N limit of 25.0 mg/l as monthly average and 50.0 mg/l as IMAX limit during summer to protect water quality standards. These values are the same as existing permitted limits. Recent DMR data show that the plant is meeting the permit limits. The average monthly mass loading is calculated to be 198 lbs./day, which is the same as existing permit. PADEP's SOP BCW-PMT-033 stated that for renewal permits, if WQM modeling results for summer indicates that an average monthly limit of 25 mg/l is acceptable, the application manager will generally establish a year-round monitoring requirement for NH_3-N, at a minimum. Therefore, current summer numeric limits and winter monitoring limits will be carried over in this renewal since none of the exceptions stated in 40 CFR §402(o)(2) are satisfied to justify backsliding.

$CBOD_5$:
The WQM 7.0 model suggests a monthly average $CBOD_5$ limit of 25 mg/l. The average monthly and average weekly mass loadings were calculated as 198 lbs/day and 297 lbs/day respectively. These limits are the same as current permit and will be carried over in this renewal. Recent DMR data shows that the facility is consistently meeting the limits.

Dissolved Oxygen (DO):
The existing permit has a minimum DO of 4.0 mg/l. Per Pa Code 25 Ch.93.7, a minimum DO of 5.0 is required for WWF. This is also supported by WQM 7.0 output. Therefore, the minimum DO limit will be changed to 5.0 mg/l.

Toxics:
Facilities with design flow less than 1.0 MGD or minor facilities not receiving flows from industrial/commercial contributors are not required to report toxics in the application. In absence of any toxics data, a reasonable potential analysis couldn't be performed.

TDS and its constituents:
PADEP's Toxic Management Spreadsheet (TMS) V1.3 was utilized to determine the effects of TDS, Sulfate, Chloride, and Bromide on the Charleroi Boro's PWS intake which is in very close proximity. The modeling results indicate no concern from TDS and its constituents. Therefore, no monitoring will be applied during this permit term.

Additional Considerations

Fecal Coliform:
The recent coliform guidance in 25 Pa. code § 92a.47.(a)(4) requires a summer technology limit of 200/100 ml as a geometric mean and an instantaneous maximum not greater than 1,000/100ml and § 92a.47.(a)(5) requires a winter limit of 2,000/100ml as a geometric mean and an instantaneous maximum not greater than 10,000/100ml. These are existing limits that will be carried over in this renewal.

E. Coli:
DEP's SOP titled "Establishing Effluent Limitations for Individual Sewage Permits (BCW-PMT-033, revised March 24, 2021) recommends quarterly E. Coli monitoring for minor sewage dischargers with a design flow of ≥ 0.05 MGD and <1.0 MGD. This requirement will be applied from this permit term.

pH:
The TBEL for pH is above 6.0 and below 9.0 S.U. (40 CFR §133.102(c) and Pa Code 25 § 95.2(1)) which are existing limits and will be carried over.

Total Suspended Solids (TSS):
There is no water quality criterion for TSS. The existing limits of 30 mg/L average monthly, 45 mg/l average weekly, and 60 mg/L instantaneous maximum will remain in the permit based on the minimum level of effluent quality attainable by secondary treatment, 25 Pa. Code § 92a.47 and 40CFR 133.102(b). The mass based average monthly and weekly average limits are calculated to be 237 lbs./day and 356 lbs./day respectively, which are the same as existing permit and will be carried over in this renewal.

UV monitoring: The existing permit has daily monitoring requirement for UV Dosage in %. % is not a compatible unit for Dosage. A conversation with the consultant indicated that the facility can record/report UV Transmittance. The only available unit for UV Transmittance is %. Therefore, the UV dosage will be changed to UV Transmittance with unit as %.

Flow, Influent BOD_5 and TSS Monitoring Requirement:
The requirement to monitor the volume of effluent will remain in the draft permit per 40 CFR § 122.44(i)(1)(ii). Influent BOD_5 and TSS monitoring requirements are established in the permit per the requirements set in Pa Code 25 Chapter 94.

Best Professional Judgement (BPJ):
Total Phosphorus:
PADEP's SOP BCW-PMT-033 suggests monitoring requirement, at a minimum, for facilities with design flow greater than 2,000 GPD. Existing quarterly monitoring requirement will be carried over in this renewal.

Monitoring Frequency and Sample Types:
Otherwise specified above, the monitoring frequency and sample type of compliance monitoring for existing parameters are recommended by DEP's SOP and Permit Writers Manual and/or on a case-by-case basis using best professional judgment (BPJ).

Total Nitrogen:
PADEP's SOP BCW-PMT-033 suggests monitoring requirement, at a minimum, for facilities with design flow greater than 2,000 GPD. This requirement is applied for all facilities meeting the flow criteria.

Anti-Backsliding
The proposed limits are at least as stringent as are in existing permit, unless otherwise stated; therefore, anti-backsliding is not applicable.

Proposed Effluent Limitations and Monitoring Requirements

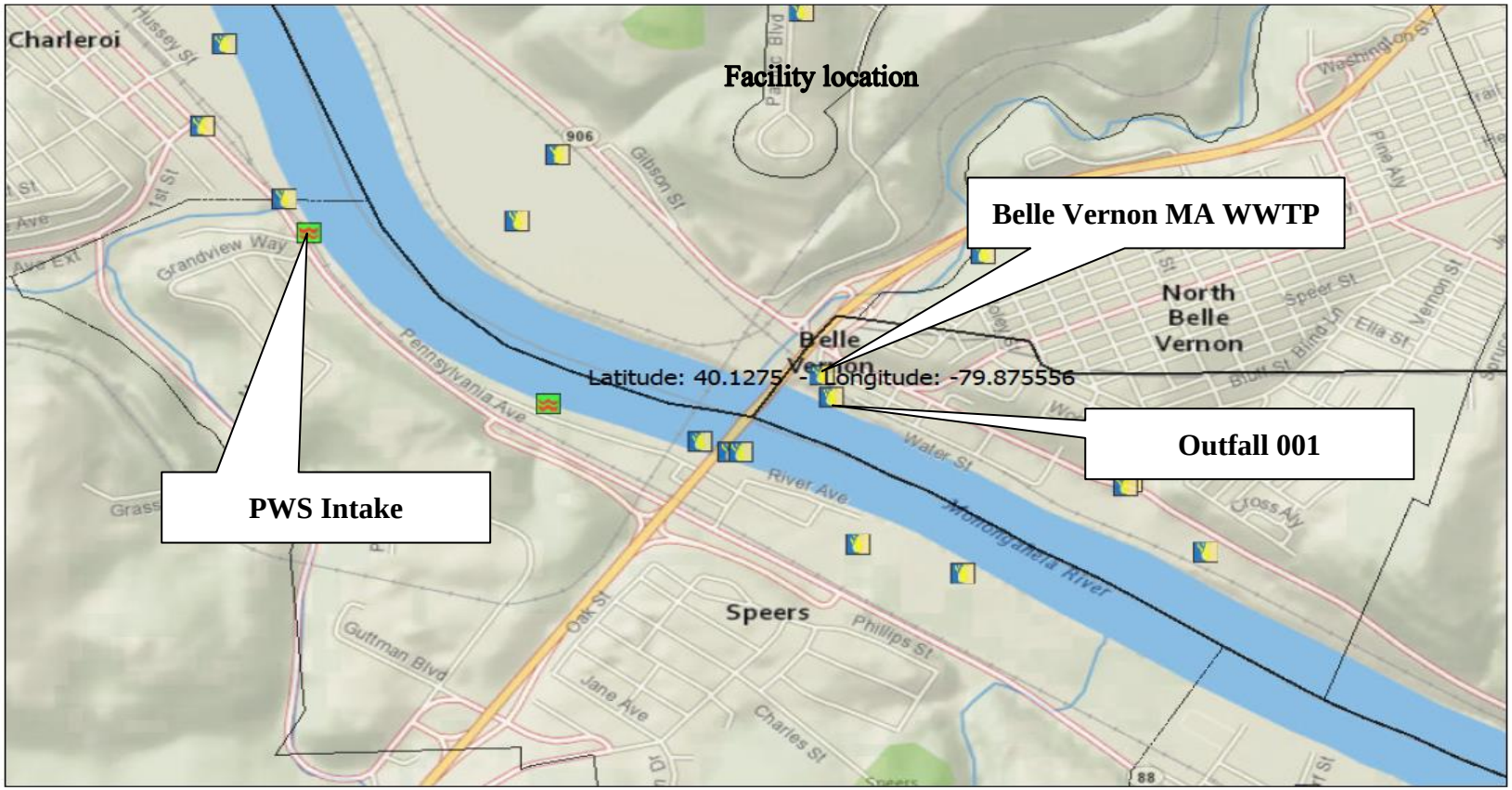
The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants).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

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Daily Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Recorded
pH (S.U.)	XXX	XXX	6.0	XXX	9.0 Daily Max	XXX	1/day	Grab
DO	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
CBOD5	198	297	XXX	25	37.5	50	1/week	8-Hr Composite
BOD5 Raw Sewage Influent	Report	Report	XXX	Report	Report	XXX	1/week	8-Hr Composite
TSS Raw Sewage Influent	Report	Report	XXX	Report	Report	XXX	1/week	8-Hr Composite
TSS	237	357	XXX	30	45	60	1/week	8-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	1/week	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/week	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	Report	XXX	Report Daily Max	1/quarter	Grab
UV Transmittance (%)	XXX	XXX	Report	XXX	XXX	XXX	1/day	Measured
Total Nitrogen	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/quarter	8-Hr Composite
Ammonia Nov 1 - Apr 30	Report	XXX	XXX	Report	XXX	XXX	1/week	8-Hr Composite
Ammonia May 1 - Oct 31	198	XXX	XXX	25	XXX	50	1/week	8-Hr Composite
Total Phosphorus	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/quarter	8-Hr Composite

Compliance Sampling Location: At Outfall 001
Other Comments: None

Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment)
☒	Toxics Management Spreadsheet (see Attachment)
☐	TRC Model Spreadsheet (see Attachment)
☐	Temperature Model Spreadsheet (see Attachment)
☐	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
☐	Technical Guidance for the Development and Specification of Effluent Limitations, 362-0400-001, 10/97.
☐	Policy for Permitting Surface Water Diversions, 362-2000-003, 3/98.
☐	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 362-2000-008, 11/96.
☐	Technology-Based Control Requirements for Water Treatment Plant Wastes, 362-2183-003, 10/97.
☐	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 362-2183-004, 12/97.
☐	Pennsylvania CSO Policy, 385-2000-011, 9/08.
☐	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
☐	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 391-2000-002, 4/97.
☐	Determining Water Quality-Based Effluent Limits, 391-2000-003, 12/97.
☐	Implementation Guidance Design Conditions, 391-2000-006, 9/97.
☐	Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 391-2000-007, 6/2004.
☐	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 391-2000-008, 10/1997.
☐	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 391-2000-010, 3/99.
☐	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 391-2000-011, 5/2004.
☐	Implementation Guidance for Section 93.7 Ammonia Criteria, 391-2000-013, 11/97.
☐	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 391-2000-014, 4/2008.
☐	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 391-2000-015, 11/1994.
☐	Implementation Guidance for Temperature Criteria, 391-2000-017, 4/09.
☐	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 391-2000-018, 10/97.
☐	Implementation Guidance for Application of Section 93.5(e) for Potable Water Supply Protection Total Dissolved Solids, Nitrite-Nitrate, Non-Priority Pollutant Phenolics and Fluorides, 391-2000-019, 10/97.
☐	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 391-2000-021, 3/99.
☐	Implementation Guidance for the Determination and Use of Background/Ambient Water Quality in the Determination of Wasteload Allocations and NPDES Effluent Limitations for Toxic Substances, 391-2000-022, 3/1999.
☐	Design Stream Flows, 391-2000-023, 9/98.
☐	Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 391-2000-024, 10/98.
☐	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 391-3200-013, 6/97.
☐	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
☒	SOP: BCW-PMT-033
☐	Other:



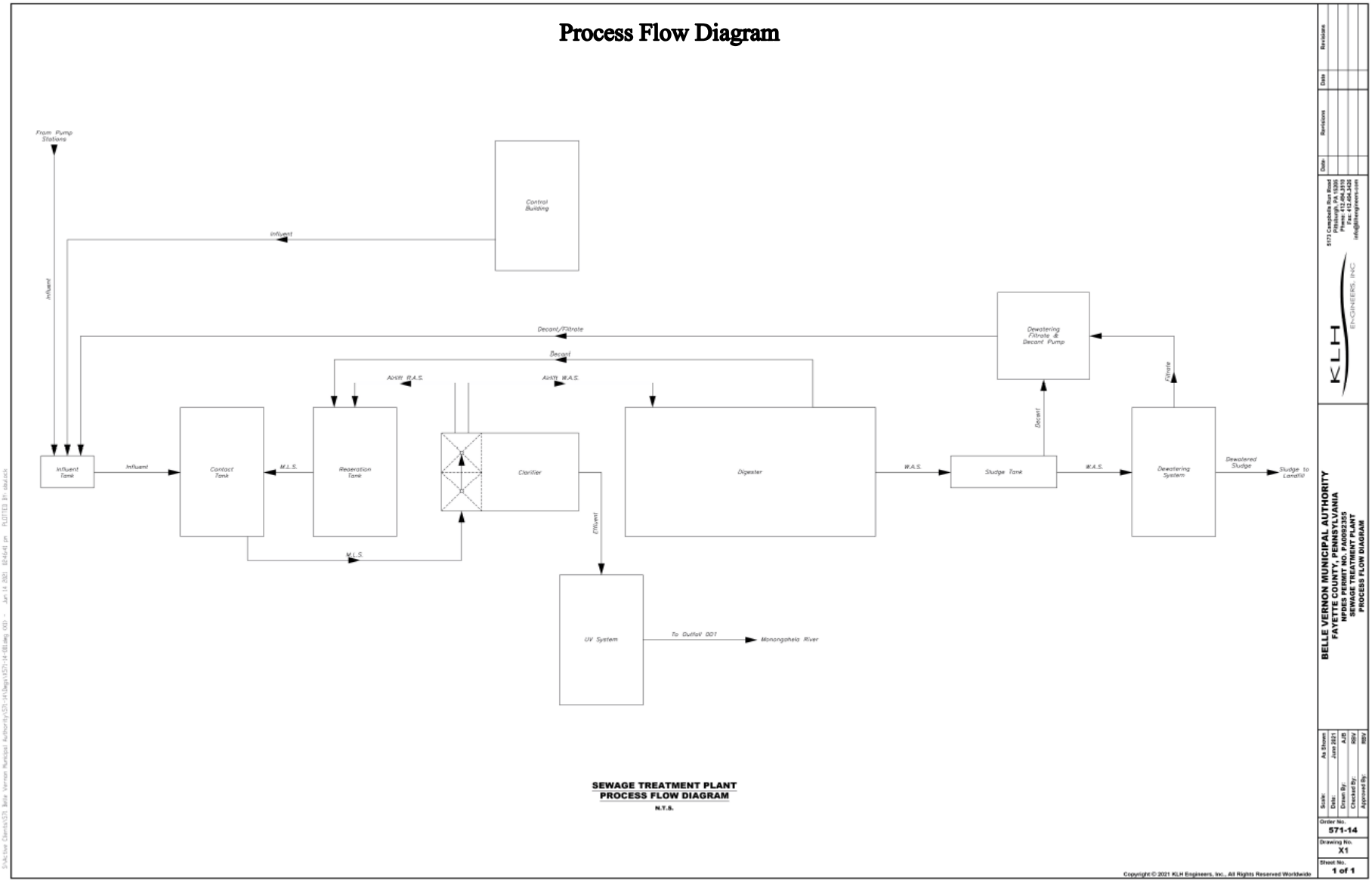
September 9, 2021

1:18,056
0 0.1 0.2 0.4 mi
0 0.17 0.35 0.7 km

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community, Sources: Esri,

Copyright PA DEP

Process Flow Diagram



Belle Vernon MA WWTP NPDES Permit #: PA0092355 Belle Vernon Borough, Fayette County		Reza H Chowdhury Project Manager September 09, 2021

PA0092355 at 001

Region ID: PA
Workspace ID: PA20210908021641377000
Clicked Point (Latitude, Longitude): 40.12608, -79.87597
Time: 2021-09-07 22:17:03 -0400

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	5190	square miles
ELEV	Mean Basin Elevation	1845	feet

Low-Flow Statistics Parameters [99.9 Percent (5190 square miles) Low Flow Region 4]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	5190	square miles	2.26	1400
ELEV	Mean Basin Elevation	1845	feet	1050	2580

Low-Flow Statistics Disclaimers [99.9 Percent (5190 square miles) Low Flow Region 4]

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

Low-Flow Statistics Flow Report [99.9 Percent (5190 square miles) Low Flow Region 4]

Statistic	Value	Unit
7 Day 2 Year Low Flow	687	ft^3/s
30 Day 2 Year Low Flow	912	ft^3/s
7 Day 10 Year Low Flow	400	ft^3/s
30 Day 10 Year Low Flow	468	ft^3/s
90 Day 10 Year Low Flow	696	ft^3/s

Low-Flow Statistics Citations

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

Permit No. PA0092355

PA0092355 at Node 2

Region ID: PA
Workspace ID: PA20210908022042109000
Clicked Point (Latitude, Longitude): 40.12783, -79.88245
Time: 2021-09-07 22:21:04 -0400

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	5200	square miles
ELEV	Mean Basin Elevation	1844	feet

Low-Flow Statistics Parameters [99.9 Percent (5200 square miles) Low Flow Region 4]

Permit No. PA0092355

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	5200	square miles	2.26	1400
ELEV	Mean Basin Elevation	1844	feet	1050	2580

Low-Flow Statistics Disclaimers [99.9 Percent (5200 square miles) Low Flow Region 4]

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

Low-Flow Statistics Flow Report [99.9 Percent (5200 square miles) Low Flow Region 4]

Statistic	Value	Unit
7 Day 2 Year Low Flow	688	ft^3/s
30 Day 2 Year Low Flow	913	ft^3/s
7 Day 10 Year Low Flow	401	ft^3/s
30 Day 10 Year Low Flow	469	ft^3/s
90 Day 10 Year Low Flow	697	ft^3/s

Low-Flow Statistics Citations

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

Permit No. PA0092355

PA0092355 at Node 3

Region ID: PA
Workspace ID: PA20210908022427527000
Clicked Point (Latitude, Longitude): 40.13443, -79.89017
Time: 2021-09-07 22:24:50 -0400

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	5210	square miles
ELEV	Mean Basin Elevation	1842	feet

Low-Flow Statistics Parameters [99.9 Percent (5210 square miles) Low Flow Region 4]

https://streamstats.usgs.gov/ss/ 9/7/2021

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	5210	square miles	2.26	1400
ELEV	Mean Basin Elevation	1842	feet	1050	2580

Low-Flow Statistics Disclaimers [99.9 Percent (5210 square miles) Low Flow Region 4]

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

Low-Flow Statistics Flow Report [99.9 Percent (5210 square miles) Low Flow Region 4]

Statistic	Value	Unit
7 Day 2 Year Low Flow	689	ft^3/s
30 Day 2 Year Low Flow	914	ft^3/s
7 Day 10 Year Low Flow	401	ft^3/s
30 Day 10 Year Low Flow	470	ft^3/s
90 Day 10 Year Low Flow	698	ft^3/s

Low-Flow Statistics Citations

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

Permit No. PA0092355

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
19A	37185	MONONGAHELA RIVER	43.780	743.66	5190.00	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.080	132.00	0.00	0.000	0.000	0.0	0.00	0.00	25.00	7.70	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Belle Vernon MA	PA0092355	0.9500	0.9500	0.9500	0.000	20.00	6.90

Parameter Data

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

Permit No. PA0092355

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
19A	37185	MONONGAHELA RIVER	43.720	743.60	5200.00	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.080	0.00	0.00	0.000	0.000	0.0	0.00	0.00	25.00	7.70	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
		0.0000	0.0000	0.0000	0.000	0.00	7.00

Parameter Data

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

Permit No. PA0092355

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
19A	37185	MONONGAHELA RIVER	42.940	743.32	5210.00	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.080	0.00	0.00	0.000	0.000	0.0	0.00	0.00	25.00	7.70	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
		0.0000	0.0000	0.0000	0.000	0.00	7.00

Parameter Data

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

Permit No. PA0092355

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
19A	37185	MONONGAHELA RIVER

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Reach Trav Time (days)	Analysis Temp (°C)	Analysis pH
Q7-10 Flow												
43.780	132.00	0.00	132.00	1.4697	0.00019	1.268	244.56	192.88	0.43	0.009	24.94	7.68
43.720	132.80	0.00	132.80	1.4697	0.00007	1.302	252.72	194.12	0.41	0.117	24.95	7.68
Q1-10 Flow												
43.780	84.48	0.00	84.48	1.4697	0.00019	NA	NA	NA	0.34	0.011	24.91	7.66
43.720	84.99	0.00	84.99	1.4697	0.00007	NA	NA	NA	0.32	0.149	24.92	7.66
Q30-10 Flow												
43.780	154.44	0.00	154.44	1.4697	0.00019	NA	NA	NA	0.47	0.008	24.95	7.68
43.720	155.38	0.00	155.38	1.4697	0.00007	NA	NA	NA	0.45	0.107	24.95	7.68

Permit No. PA0092355

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	☑
WLA Method	EMPR	Use Inputted W/D Ratio	☐
Q1-10/Q7-10 Ratio	0.64	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.17	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	5		

Permit No. PA0092355

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
19A	37185	MONONGAHELA RIVER

NH3-N Acute Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
43.780	Belle Vernon MA	3.28	50	3.28	50	0	0
43.720		NA	NA	3.28	NA	NA	NA

NH3-N Chronic Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
43.780	Belle Vernon MA	.92	25	.92	25	0	0
43.720		NA	NA	.91	NA	NA	NA

Dissolved Oxygen Allocations

RMI	Discharge Name	CBOD5		NH3-N		Dissolved Oxygen		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
43.78	Belle Vernon MA	25	25	25	25	5	5	0	0
43.72		NA	NA	NA	NA	NA	NA	NA	NA

Permit No. PA0092355

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
19A	37185	MONONGAHELA RIVER

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
43.780	0.950	24.945	7.675
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
244.558	1.268	192.879	0.430
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.25	0.182	0.28	1.024
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
8.207	0.428	Tsivoglou	5
Reach Travel Time (days)			
0.009			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.001	2.25	0.28	7.55
0.002	2.25	0.27	7.55
0.003	2.25	0.27	7.55
0.003	2.25	0.27	7.55
0.004	2.25	0.27	7.55
0.005	2.25	0.27	7.55
0.006	2.25	0.27	7.55
0.007	2.25	0.27	7.55
0.008	2.25	0.27	7.55
0.009	2.25	0.27	7.55

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
43.720	0.950	24.945	7.675
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
252.722	1.302	194.117	0.408
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.25	0.163	0.27	1.024
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.550	0.146	Tsivoglou	5
Reach Travel Time (days)			
0.117			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.012	2.24	0.27	7.53
0.023	2.24	0.26	7.51
0.035	2.23	0.26	7.49
0.047	2.23	0.26	7.47
0.058	2.22	0.26	7.45
0.070	2.22	0.25	7.42
0.082	2.21	0.25	7.40
0.093	2.20	0.25	7.39
0.105	2.20	0.24	7.37
0.117	2.19	0.24	7.35

Permit No. PA0092355

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
19A	37185	MONONGAHELA RIVER

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
43.780	Belle Vernon MA	PA0092355	0.950	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			5

Permit No. PA0092355

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.3, March 2021

Discharge Information

Instructions | Discharge | Stream

Facility: **Belle Vernon MA** NPDES Permit No.: **PA0092355** Outfall No.: **001**

Evaluation Type: **Major Sewage / Industrial Waste** Wastewater Description: **Treated sewage**

Discharge Characteristics								
Design Flow (MGD)*	Hardness (mg/l)*	pH (SU)*	Partial Mix Factors (PMFs)				Complete Mix Times (min)	
			AFC	CFC	THH	CRL	Q_{7-10}	Q_h
0.95	100	7						

					0 if left blank		0.5 if left blank		0 if left blank			1 if left blank	
	Discharge Pollutant	Units	Max Discharge Conc		Trib Conc	Stream Conc	Daily CV	Hourly CV	Stream CV	Fate Coeff	FOS	Criteria Mod	Chem Transl
Group 1	Total Dissolved Solids (PWS)	mg/L		449									
	Chloride (PWS)	mg/L		148									
	Bromide	mg/L		2									
	Sulfate (PWS)	mg/L		67.8									
	Fluoride (PWS)	mg/L											
Group 2	Total Aluminum	µg/L											
	Total Antimony	µg/L											
	Total Arsenic	µg/L											
	Total Barium	µg/L											
	Total Beryllium	µg/L											
	Total Boron	µg/L											
	Total Cadmium	µg/L											
	Total Chromium (III)	µg/L											
	Hexavalent Chromium	µg/L											
	Total Cobalt	µg/L											
	Total Copper	µg/L											
	Free Cyanide	µg/L											
	Total Cyanide	µg/L											
	Dissolved Iron	µg/L											
	Total Iron	µg/L											
	Total Lead	µg/L											
	Total Manganese	µg/L											
	Total Mercury	µg/L											
	Total Nickel	µg/L											
	Total Phenols (Phenolics) (PWS)	µg/L											
	Total Selenium	µg/L											
	Total Silver	µg/L											
	Total Thallium	µg/L											
	Total Zinc	µg/L											
	Total Molybdenum	µg/L											
	Acrolein	µg/L	<										
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<										
	Benzene	µg/L	<										
	Bromoform	µg/L	<										

Permit No. PA0092355

Group 3	Carbon Tetrachloride	µg/L	<											
	Chlorobenzene	µg/L												
	Chlorodibromomethane	µg/L	<											
	Chloroethane	µg/L	<											
	2-Chloroethyl Vinyl Ether	µg/L	<											
	Chloroform	µg/L	<											
	Dichlorobromomethane	µg/L	<											
	1,1-Dichloroethane	µg/L	<											
	1,2-Dichloroethane	µg/L	<											
	1,1-Dichloroethylene	µg/L	<											
	1,2-Dichloropropane	µg/L	<											
	1,3-Dichloropropylene	µg/L	<											
	1,4-Dioxane	µg/L	<											
	Ethylbenzene	µg/L	<											
	Methyl Bromide	µg/L	<											
	Methyl Chloride	µg/L	<											
	Methylene Chloride	µg/L	<											
	1,1,2,2-Tetrachloroethane	µg/L	<											
	Tetrachloroethylene	µg/L	<											
	Toluene	µg/L	<											
	1,2-trans-Dichloroethylene	µg/L	<											
	1,1,1-Trichloroethane	µg/L	<											
	1,1,2-Trichloroethane	µg/L	<											
	Trichloroethylene	µg/L	<											
	Vinyl Chloride	µg/L	<											
Group 4	2-Chlorophenol	µg/L	<											
	2,4-Dichlorophenol	µg/L	<											
	2,4-Dimethylphenol	µg/L	<											
	4,6-Dinitro-o-Cresol	µg/L	<											
	2,4-Dinitrophenol	µg/L	<											
	2-Nitrophenol	µg/L	<											
	4-Nitrophenol	µg/L	<											
	p-Chloro-m-Cresol	µg/L	<											
	Pentachlorophenol	µg/L	<											
	Phenol	µg/L	<											
	2,4,6-Trichlorophenol	µg/L	<											
Group 5	Acenaphthene	µg/L	<											
	Acenaphthylene	µg/L	<											
	Anthracene	µg/L	<											
	Benzidine	µg/L	<											
	Benzo(a)Anthracene	µg/L	<											
	Benzo(a)Pyrene	µg/L	<											
	3,4-Benzofluoranthene	µg/L	<											
	Benzo(ghi)Perylene	µg/L	<											
	Benzo(k)Fluoranthene	µg/L	<											
	Bis(2-Chloroethoxy)Methane	µg/L	<											
	Bis(2-Chloroethyl)Ether	µg/L	<											
	Bis(2-Chloroisopropyl)Ether	µg/L	<											
	Bis(2-Ethylhexyl)Phthalate	µg/L	<											
	4-Bromophenyl Phenyl Ether	µg/L	<											
	Butyl Benzyl Phthalate	µg/L	<											
	2-Chloronaphthalene	µg/L	<											
	4-Chlorophenyl Phenyl Ether	µg/L	<											
	Chrysene	µg/L	<											
	Dibenzo(a,h)Anthrancene	µg/L	<											
	1,2-Dichlorobenzene	µg/L	<											
	1,3-Dichlorobenzene	µg/L	<											
	1,4-Dichlorobenzene	µg/L	<											
	3,3-Dichlorobenzidine	µg/L	<											
	Diethyl Phthalate	µg/L	<											
	Dimethyl Phthalate	µg/L	<											
	Di-n-Butyl Phthalate	µg/L	<											
	2,4-Dinitrotoluene	µg/L	<											

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

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Toxics Management Spreadsheet
Version 1.3, March 2021

Stream / Surface Water Information

Belle Vernon MA, NPDES Permit No. PA0092355, Outfall 001

Instructions | Discharge | Stream

Receiving Surface Water Name: **Monongahela River**

No. Reaches to Model: 1

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

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi²)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	037185	43.78	743.66	5190			Yes
End of Reach 1	037185	43.72	743.6	5200			Yes

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

Location	RMI	LFY (cfs/mi²)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	43.78	0.08										116	7.6		
End of Reach 1	43.72	0.08													

Q_h

Location	RMI	LFY (cfs/mi²)	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	43.78														
End of Reach 1	43.72														

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Toxics Management Spreadsheet
Version 1.3, March 2021

Model Results

Belle Vernon MA, NPDES Permit No. PA0092355, Outfall 001

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

☐ ***Hydrodynamics***

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 6.484 PMF: 0.035 Analysis Hardness (mg/l): 114.52 Analysis pH: 7.49

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	

☑ ***CFC*** CCT (min): 720 PMF: 0.241 Analysis Hardness (mg/l): 115.77 Analysis pH: 7.58

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	

☑ ***THH*** CCT (min): 720 PMF: 0.241 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	500,000	500,000	N/A	
Chloride (PWS)	0	0		0	250,000	250,000	N/A	
Sulfate (PWS)	0	0		0	250,000	250,000	N/A	

☑ ***CRL*** CCT (min): 720 PMF: 0.362 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	

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Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	

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

No. Samples/Month: 4

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

☑ ***Other Pollutants without Limits or Monitoring***

The following pollutants do not require effluent limits or monitoring based on water quality because reasonable potential to exceed water quality criteria was not determined and the discharge concentration was less than thresholds for monitoring, or the pollutant was not detected and a sufficiently sensitive analytical method was used (e.g., <= Target QL).

Pollutants	Governing WQBEL	Units	Comments
Total Dissolved Solids (PWS)	N/A	N/A	PWS Not Applicable
Chloride (PWS)	N/A	N/A	PWS Not Applicable
Bromide	N/A	N/A	No WQS
Sulfate (PWS)	N/A	N/A	PWS Not Applicable