pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0087955**
Facility Type	**Municipal**	APS ID	**31746**
Major / Minor	**Minor**	Authorization ID	**1374705**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Cassville Water & Sewer Authority** **Huntingdon County**	Facility Name	**Cassville STP**
Applicant Address	PO Box 48 Cassville, PA 16623-0048	Facility Address	16893 Sportsman Club Road Cassville, PA 16623
Applicant Contact	Mark Whitsel	Facility Contact	Rodney Thomas
Applicant Phone	(814) 448-2365	Facility Phone	(814) 448-4948
Client ID	120455	Site ID	496153
Ch 94 Load Status	Not Overloaded	Municipality	Cass Township
Connection Status	No Limitations	County	Huntingdon
Date Application Received	October 29, 2021	EPA Waived?	Yes
Date Application Accepted	November 2, 2021	If No, Reason	

Purpose of Application: NPDES permit renewal.

Summary of Review

On behalf of Cassville Water and Sewer Authority, Stiffler McGraw and Associates, Inc. has applied to the Pennsylvania Department of Environmental Protection (DEP) for reissuance of its National Pollutant Discharge Elimination System (NPDES) permit. This permit renewal application was received on October 29, 2021. The permit was last reissued on April 28, 2017, authorizing discharge of treated sewage from the existing treatment plant located in Cass Township, Huntingdon County into UNT to UNT to UNT to Little Trough Creek. The permit expired on April 30, 2022.

Cassville Water and Sewer Authority owns operates and maintains the wastewater treatment plant located in Cassville Borough, Cass township, Huntingdon County. The collection system has 100% sewers from Cassville Borough. The facility has a design average annual flow and hydraulic capacity design of 0.03 MGD.

The WQM Permit Nos. 3199401 & 3199401 03-1 were issued on July 7, 1999 & April 15, 2003.

The treatment plant utilizes Ultraviolet disinfection.

Sludge use and disposal description and location(s): N/A due to the sludge is hauled away to Spring Creek Township WWTP.

Changes from the previous permit: Unit of Fecal Coliform changed from CFU/100 ml to No./100 ml. The E. Coli. monitoring and report requirements will add to the permit.

Based on the review outline in this fact sheet, it is recommended that the permit be drafted and published in the Pennsylvania Bulletin for public comments for 30 days.

Approve	Deny	Signatures	Date
X		*Hilaryle* Hilary H. Le / Environmental Engineering Specialist	April 15, 2022
X		/s/ Daniel W. Martin, P.E. / Environmental Engineer Manager	May 9, 2022

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	001	Design Flow (MGD)	.03
Latitude	40º 18' 0.72"	Longitude	-78º 1' 33.83"
Quad Name	Cassville	Quad Code	
Wastewater Description:	Sewage Effluent		
Receiving Waters	UNT to UNT to UNT to Little Trough Creek (TSF)	Stream Code	13553
NHD Com ID	65841009	RMI	0.15 mile
Drainage Area	0.66 mi.^{2}	Yield (cfs/mi^2)	See comment below
Q_{7-10} Flow (cfs)	See comments below	Q_{7-10} Basis	USGS StreamStats
Elevation (ft)		Slope (ft/ft)	
Watershed No.	11-D	Chapter 93 Class.	TSF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment			
Source(s) of Impairment			
TMDL Status		Name	
Nearest Downstream Public Water Supply Intake	Newport Boro Water Authority, Perry County		
PWS Waters	Juniata River	Flow at Intake (cfs)	
PWS RMI	12.74 miles	Distance from Outfall (mi)	Approximate 119.0 miles

Changes Since Last Permit Issuance: none

Drainage Area

The discharge is to UNT to UNT to UNT to Little Trough Creek at RMI 0.15 miles. A drainage area upstream of the discharge is estimated to be 0.66 mi.^{2}, according to USGS PA StreamStats available at https://streamstats.usgs.gov/ss/.

Stream Flow

The nearest downstream USGS Stream gage is 01562000 on Raystown Branch Juniata River at Saxton, PA. The drainage area at this Stream gage is 754 mi.^{2}. Stream data provided Q_{7-10}, to be 44.8 cfs, respectively. The drainage area at discharge point is found to be 0.66 mi^2 according to USGS PA StreamStats available at https://streamstats.usgs.gov/ss/) which results in a Q_{7-10} low flow yield of 0.06 cfs/mi.^{2}. This information is used to obtain a chronic or 30-day (Q_{30-10}), and an acute or 1-day (Q_{1-10}) exposure stream flow for the discharge point as follows (Guidance No. 391-2000-023):

Low Flow Yield = 44.8 cfs / 754 mi.^{2} ≈ 0.06 cfs/mi.^{2}

Q_{7-10} discharge = 0.06 cfs/mi.^{2} x D.A discharge = 0.06 cfs/mi.^{2} x 0.66 mi.^{2} = 0.04 cfs

Q_{30-10} = 1.36 * 0.04 cfs ≈ 0.05 cfs

Q_{1-10} = 0.64 * 0.04 cfs ≈ 0.03 cfs

The resulting dilution ratio (under Q_{7-10} conditions) is: Q_{stream} / $Q_{discharge}$ = 0.04 cfs / [0.03 MGD * (1.55 cfs/MGD)] = 0.86:1

UNT to UNT to UNT to Little Trough Creek

25 Pa. Code § 93.9o classifies UNT to UNT to UNT Little Trough Creek as Trout-Stocking Fish (TSF) surface water. Based on the 2020 Integrated Report, Little Trough Creek, assessment unit ID 7436, is not impaired. A TMDL currently does not exist for this stream segment, therefore, no TMDL has been taken into consideration during this review.

Public Water Supply

The nearest downstream public water supply intake is for Newport Borough Water System in Perry County on the Juniata River, approximately 119.0 miles downstream of this discharge. Considering distance and dilution, the discharge is not expected to impact the water supply.

Treatment Facility Summary				

Treatment Facility Name: Cassville STP

WQM Permit No.	Issuance Date	Description
3199401	7/7/1999	New permit
3199401 03-1	4/15/2003	Addition of a post aeration tank

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary With Ammonia Reduction	Extended Aeration	Ultraviolet	0.03

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.03	52	Not Overloaded	Aerobic Digestion	Other WWTP

Changes Since Last Permit Issuance: None

The WWTP train is:

Fine Bar Screen (1) ⇒ Equalization Tank (1) ⇒ Aeration Tanks (4) ⇒ Clarifiers (2) ⇒ Ultraviolet System (1) ⇒ Post-Aeration Tank (1) ⇒ Sludge Digesters (2) ⇒ Discharge

The system incorporates the chemical addition of soda ash (for pH control).

The Township has some commercial wastewater contributors such as gas station, general store-restaurant, car wash, two churches, car dealership-garage, and medical center.

Compliance History	
Summary of DMRs:	The DMRs reported from March 1, 2021 to February 28, 2022 is summarized in the Table below (Pages # 4 & 5).
Summary of Inspections:	1/21/2022: Mr. Clark, DEP WQS, conducted a compliance evaluation inspection. There were violations noted during inspection: failure to maintain records for at least 3 years. The effluent looked clear and all field test results were within the permit limits. Updated on 2/2/2022, Mr. Clark spoke on the phone with certified operator Mr. Rodney Thomas. Mr. Thomas explained that the records were given to the Authority secretary and that she misplaced them due to the maintain records problems. Mr. Thomas will be contacting the secretary to inquire about the records. 10/24/2019: Mr. Clark, DEP WQS, conducted a compliance evaluation inspection. There were no violations noted during the inspection. The effluent was clear. Field test results were within permit limits. 10/11/2018: Mr. Clark, DEP WQS, conducted a compliance evaluation inspection. There were no violations noted during the inspection. The recommendations were to adjust effluent sampler refrigerator temperature and submit a revised lab accreditation supplemental form. The effluent was clear. Field test results were within permit limits. 10/17/2017: Mr. Clark, DEP WQS, conducted a compliance evaluation inspection. There were no violations noted during the inspection. The effluent was clear. Field test results were within permit limits.
Other Comments:	There are currently 4 open violations associated to the permittee or the facility.

Other Comments:

Compliance History

DMR Data for Outfall 001 (from March 1, 2021 to February 28, 2022)

Parameter	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21	SEP-21	AUG-21	JUL-21	JUN-21	MAY-21	APR-21	MAR-21
Flow (MGD) Average Monthly	0.037	0.020	0.020	0.013	0.011	0.025	0.011	0.011	0.010	0.015	0.020	0.027
Flow (MGD) Daily Maximum	0.079	0.045	0.097	0.021	0.026	0.093	0.042	0.023	0.016	0.031	0.054	0.076
pH (S.U.) Instantaneous Minimum	6.9	6.9	6.6	6.8	6.6	6.7	6.7	6.7	6.7	6.8	6.6	6.8
pH (S.U.) Instantaneous Maximum	7.5	7.5	7.5	7.65	7.5	7.8	7.8	7.6	7.7	7.8	7.5	7.3
DO (mg/L) Daily Minimum	6.8	6.8	7.2	8.2	8.3	5.8	6.1	6.8	6.4	7.0	7.0	7.2
CBOD5 (lbs/day) Average Monthly	< 0.7	< 0.8	0.3	< 0.4	< 0.2	< 0.4	< 0.3	< 0.3	< 0.5	< 0.4	< 0.4	< 0.9
CBOD5 (lbs/day) Weekly Average	1.1	< 1.1	0.4	< 0.4	< 0.3	< 0.5	< 0.3	< 0.4	0.7	0.6	0.5	< 1.3
CBOD5 (mg/L) Average Monthly	< 4.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 6.0	< 4.0	< 3.0	< 3.0
CBOD5 (mg/L) Weekly Average	5.0	4.0	3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	9.0	6.0	< 3.0	< 3.0
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	29	18	19	21	16	26	13	29	24	19	20	13
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	36	22	21	23	16	37	15	33	29	21	30	15
BOD5 (mg/L) Raw Sewage Influent Average Monthly	182	87	197	155	198	212	152	326	285	204	66	60.8
TSS (lbs/day) Average Monthly	1.8	2.8	1.8	2.0	1.2	1.3	0.8	0.7	1.1	1.3	1.8	1.9
TSS (lbs/day) Raw Sewage Influent Average Monthly	1.8	14	12	15	8	18	7	11	8	11	20	8
TSS (lbs/day) Raw Sewage Influent Daily Maximum	2.5	18	15	15	10	30	10	12	9	14	36	10
TSS (lbs/day) Weekly Average	2.5	4.0	2.0	2.7	1.6	2.3	0.8	0.9	1.5	1.3	2.5	3.0

TSS (mg/L) Average Monthly	11.0	11.0	18.0	14.0	16.0	9.0	9.0	8.0	14.0	14.0	12.0	6.0
TSS (mg/L) Raw Sewage Influent Average Monthly	11	60	123	112	106	131	81	128	96	123	58	34
TSS (mg/L) Weekly Average	12.0	12.0	20.0	19.0	21.0	14.0	10	8.0	18.0	16.0	14.0	7.0
Fecal Coliform (No./100 ml) Geometric Mean	1	1.0	1	2	2	4	5	4	< 2	< 2	< 4.0	6
Fecal Coliform (No./100 ml) Instantaneous Maximum	1	1.0	1	2	3	4.1	13.1	4.1	4	< 4.0	< 4.0	8
Nitrate-Nitrite (mg/L) Average Quarterly			< 23.67			16.81			20.42			11.05
Nitrate-Nitrite (lbs) Total Quarterly			184			48.8			200.2			240.3
Total Nitrogen (mg/L) Average Quarterly			24.17			< 17.35			< 20.92			11.6
Total Nitrogen (lbs) Total Quarterly			184			< 50.4			209.3			252.5
Total Nitrogen (lbs) Total Annual						< 650						
Ammonia (lbs/day) Average Monthly	< 0.008	< 0.01	< 0.005	< 0.006	< 0.004	< 0.006	< 0.009	< 0.004	< 0.004	< 0.1	< 0.007	< 0.01
Ammonia (mg/L) Average Monthly	< 0.0475	< 0.0475	< 0.0475	< 0.0475	< 0.0475	< 0.0475	< 0.1	< 0.0475	< 0.0475	< 0.9388	< 0.0475	< 0.0475
Ammonia (mg/L) Average Quarterly			< 0.0475			< 0.0475			< 0.0475			< 0.0475
Ammonia (lbs) Total Quarterly			0.368			< 0.1			< 0.46			< 0.9
Ammonia (lbs) Total Annual						< 5						
TKN (mg/L) Average Quarterly			0.5			< 0.54			< 0.5			0.50
TKN (lbs) Total Quarterly			3.68			< 1.5			< 4.55			10.8
Total Phosphorus (mg/L) Average Quarterly			3.78			4.57			1.18			1.64
Total Phosphorus (lbs) Total Quarterly			2.76			12.2			9.1			36.0
Total Phosphorus (lbs) Total Annual						121						

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.03
Latitude 40º 18' 0.69" **Longitude** -78º 1' 33.78"
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: Total residual chlorine is not applied this facility.

Water Quality-Based Limitations

Ammonia (NH_3-N):
NH_3N calculations are based on the Department's Implementation Guidance of Section 93.7 Ammonia Criteria, dated 11/4/97 (ID No. 391-2000-013). The following data is necessary to determine the in-stream NH_3-N criteria used in the attached WQM 7.0 computer model of the stream:

*	Discharge pH	=	7.0	(Default)
*	Discharge Temperature	=	20°C	(Default)
*	Stream pH	=	7.0	(Default)
*	Stream Temperature	=	20ºC	(Default)
*	Background NH_3-N	=	0 mg/L	(Default)

Regarding NH_3-N limits, the attached computer printout of the WQM 7.0 stream model (version 1.1) indicates that a limit of 4.08 mg/L as a monthly average and 8.16 mg/L IMAX are necessary to protect the aquatic life from toxicity effects at the point of discharge. However, the existing limits of 4.0 mg/L monthly average & 8.0 mg/L IMAX are more stringent and will remain in the proposed permit. Per anti-backsliding policy, the existing winter average monthly limit of 12.0 mg/L & IMAX limit of 24.0 mg/L will remain in place. Recent DMRs and inspection reports show that the facility has been consistently achieving these limits. Mass limits are calculated as follows:

Summer average monthly mass limit: 4.0 mg/L x 0.03 MGD x 8.34 = 1.00 lbs/day
Winter average monthly mass limit: 12.0 mg/L x 0.03 MGD x 8.34 = 3.00 lbs/day

Carbonaceous Biochemical Oxygen Demand ($CBOD_5$):
The attached computer printout of the WQM 7.0 stream model (ver. 1.1) indicates that a monthly average limit of 25.0 mg/l, or secondary treatment, is adequate to protect the water quality of the stream. The existing permit 25.0 mg/L as AML, 40.0 mg/L as weekly average limit (AWL), & 50.0 mg/L as IMAX will be in the proposed permit. Recent DMRs and inspection reports show that the facility has typically been achieving concentrations below this limit. Mass limits are calculated as follows:

Average monthly mass limit: 25.0 mg/L x 0.03 MGD x 8.34 = 6.26 (6.3) lbs/day
Average weekly mass limit: 40.0 mg/L x 0.03 MGD x 8.34 = 10.0 lbs/day

Total Suspended Solids (TSS):
The existing technology-based limits of 30.0 mg/L average monthly, 45.0 mg/L weekly average, and 60.0 mg/L instantaneous maximum will remain in the proposed permit based on the minimum level of effluent quality attainable by secondary treatment based on 25 Pa. Code § 92a.47. Recent DMRs and inspection reports show that the facility has been consistently achieving these limits. Mass limits are calculated as follows:

Average monthly mass limit: 30.0 mg/L x 0.03 MGD x 8.34 = 7.51 (7.5) lbs/day
Average weekly mass limit: 45.0 mg/L x 0.03 MGD x 8.34 = 11.26 (11.3) lbs/day

Dissolved Oxygen (D.O.):
The D.O. goal is 6.0 mg/L. However, a minimum D.O. of 5.0 mg/L is required per 25 Pa. Code § 93.7. It is recommended that this limit be maintained in the proposed permit to ensure the protection of water quality standards. This approach is consistent with DEP's current Standard Operating Procedure (SOP) No. BPNPSM-PMT-033 and has been applied to other point source dischargers throughout the state.

pH:
The effluent discharge pH should remain above 6.0 and below 9.0 standard units according to 25 Pa. Code § 95.2(1).

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.

E. Coli:
As recommended by DEP's SOP No. BPNPSM-PMT-033, a routine monitoring for E. Coli will be included in the proposed permit under 25 Pa. Code § 92a.61. This requirement applies to all sewage dischargers greater than 0.002 MGD in their new and reissued permits. A monitoring frequency of 1/year will be included in the permit to be consistent with the recommendation from this SOP.

UV:
DEP currently does not recognize the UV intensity in % as a valid effluent parameter. DEP's SOP No. BCW-PMT-033, revised March 24, 2021, version 1.9, recommends the following permitting approach under such circumstances:

> *For existing facilities that are unable to monitor and report on UV system operation in one of the standard units listed above, a parameter of "UV Functional" may be reported on the Daily Effluent Monitoring Form (3800-FM-BCQ0435). Permittees reporting using this method will select the "UV Functional" parameter with Units of "Y/N" on the Limits worksheet and report values of "1" for Yes (UV Functional) and "< 1" for No (UV Not Functional).*

Therefore, the Part C.I.E. Condition - Ultraviolet (UV) System Monitoring Requirements, will be included the paragraph below in the permit.

"The permittee shall report operation of the ultraviolet (UV) disinfection system on a daily basis using the Daily Effluent Form (3800-FM-BCQ0435) and parameter named "UV Functional". The permittee shall report values of "1" for Yes (i.e., the UV system is functional) and "< 1" for No (i.e., the UV system is not functional). The UV system shall be considered functional when all components that are necessary for disinfection to achieve effluent limitations in Part A of this permit are operating properly."

Raw Sewage Influent Monitoring:
As a result of negotiation with EPA, influent monitoring of TSS and BOD_5 are required for any POTWs; therefore, influent sampling of BOD_5 and TSS will be remain in the proposed permit. A 24-hr composite sample type will be required to be consistent with the proposed sampling frequency for TSS and BOD_5 in the effluent.

Toxics:
DEP utilizes a Toxics Management Spreadsheet (last modified on March 2021 ver. 1.3) to facilitate calculations necessary for completing a reasonable potential analysis and determining WQBELs for toxic pollutants. The effluent testing information renewal application (page # 7) indicates that there are no toxic pollutants of concern.

Total Phosphorus:
Local total phosphorus limits are not applicable to this facility since there is no known nutrient related impairment noted in Juniata sub-watershed. A travel time study was conducted for this facility during its proposal of discharge to see whether this facility is within three-days travel time distance from Lake Raystown. The travel time study was conducted in 1997

and 1998 and concluded that this facility is about 3.5 days travel from the lake hence no phosphorus limits were necessary.

Chesapeake Bay Strategy:
Phase 2 WIP identifies Cassville WWTP as a non-significant Phase 5 facility. DEP's SOP mentioned that for facilities with design flows > 2,000 GPD will include monitoring, at a minimum, for Total Nitrogen and Total Phosphorus, with a monitoring frequency specified in DEP's technical guidance. Therefore, 1/quarter TN species (such as Ammonia-Nitrogen, Nitrate-Nitrite as N, Total Kjeldahl Nitrogen, and Total Nitrogen) and TP monitoring requirements will remain in the proposed permit.

Stormwater:
There is no known stormwater outfall associated with this facility.

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. No High-Quality Waters are impacted by this discharge. No Exceptional Value Waters are impacted by this discharge.

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

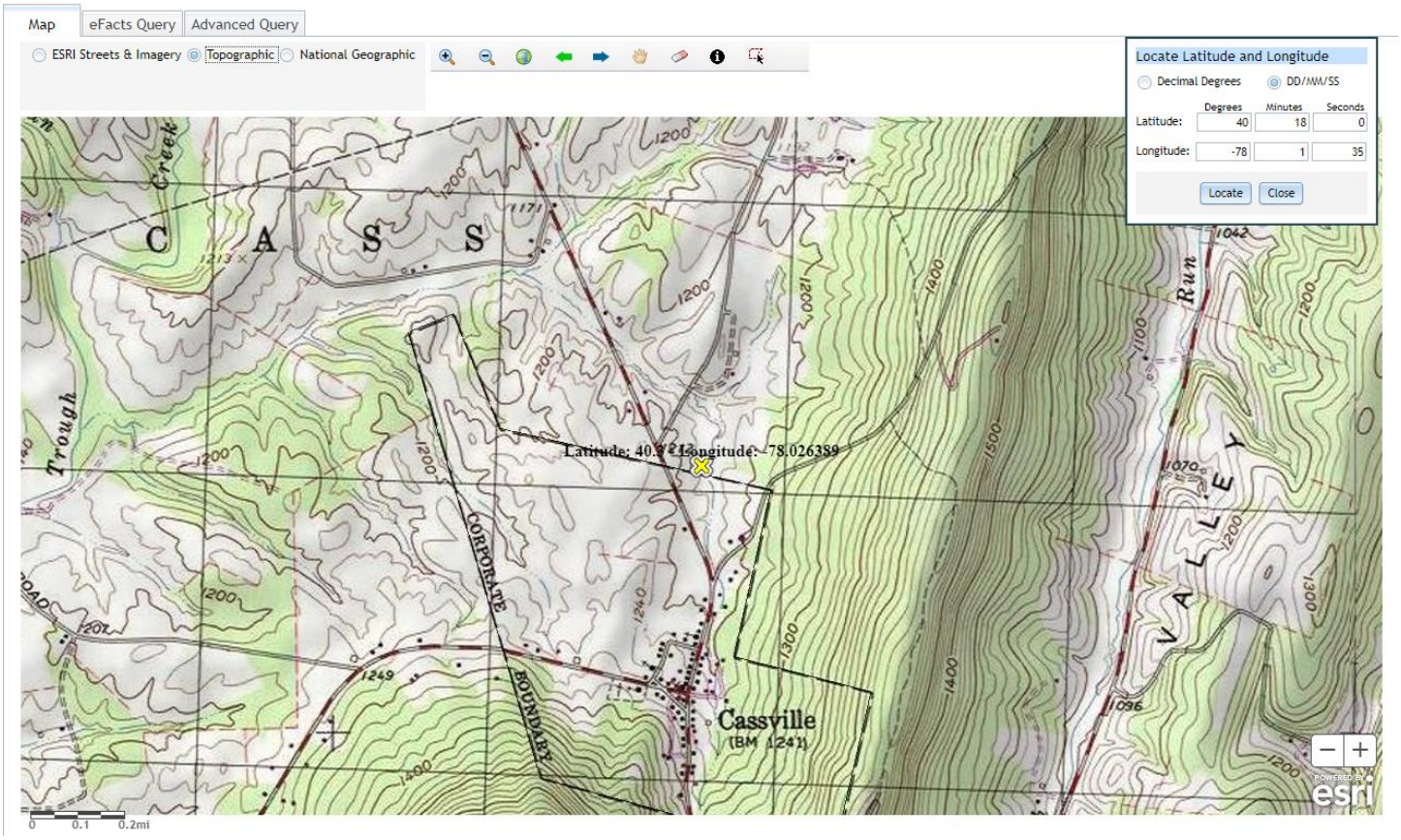
303(d) Listed Streams:
The discharge from this facility is to a stream segment that is attaining its designated use(s).

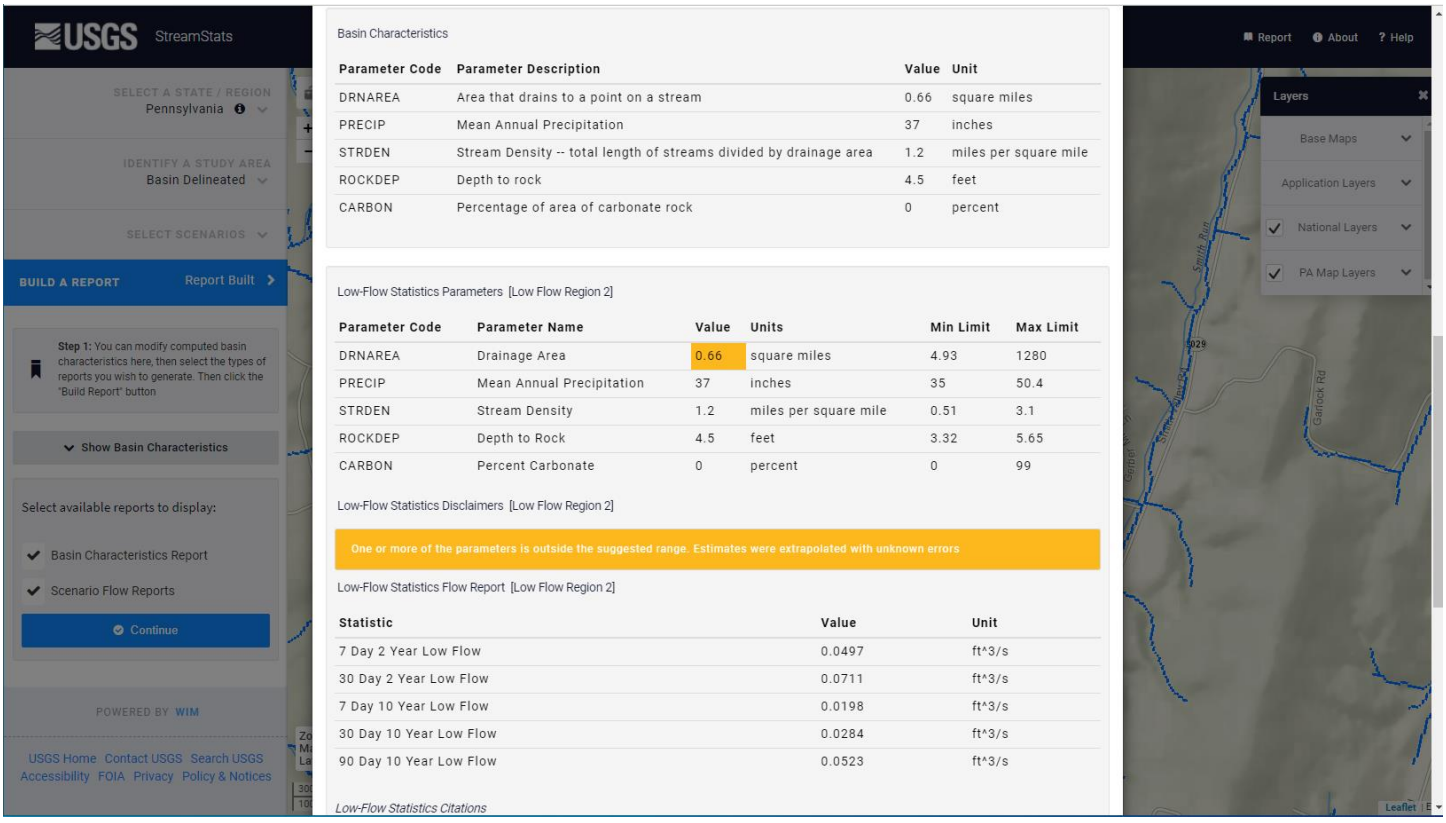
<u>WQM 7.0 Data</u>:

*	Discharge pH	=	7.0	(Default)
*	Discharge Temperature	=	20°C	(Default)
*	Stream pH	=	7.0	(Default)
*	Stream Temperature	=	20°C	(Default)
*	Background NH_3-N	=	0 mg/L	(Default)

Node 1: Cassville water and Sewer Authority Outfall 001 (13553)
Elevation: 1170 ft (USGS National Map Viewer)
Drainage Area: 0.66 $mi.^2$ (USGS PA StreamStats)
River Mile Index: 0.15 (PA DEP eMapPA)
Low Yield: 0.06 $cfs/mi.^2$
Discharge Flow: 0.03 MGD

Node 2: Just before confluence with UNT 13552
Elevation: 1165 ft (USGS National Map Viewer)
Drainage Area: 0.71 $mi.^2$ (USGS PA StreamStats)
River Mile Index: 0.001 (PA DEP eMapPA)
Low Yield: 0.06 $cfs/mi.^2$
Discharge Flow: 0.000 MGD





Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.66	square miles
PRECIP	Mean Annual Precipitation	37	inches
STRDEN	Stream Density -- total length of streams divided by drainage area	1.2	miles per square mile
ROCKDEP	Depth to rock	4.5	feet
CARBON	Percentage of area of carbonate rock	0	percent

Low-Flow Statistics Parameters [Low Flow Region 2]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.66	square miles	4.93	1280
PRECIP	Mean Annual Precipitation	37	inches	35	50.4
STRDEN	Stream Density	1.2	miles per square mile	0.51	3.1
ROCKDEP	Depth to Rock	4.5	feet	3.32	5.65
CARBON	Percent Carbonate	0	percent	0	99

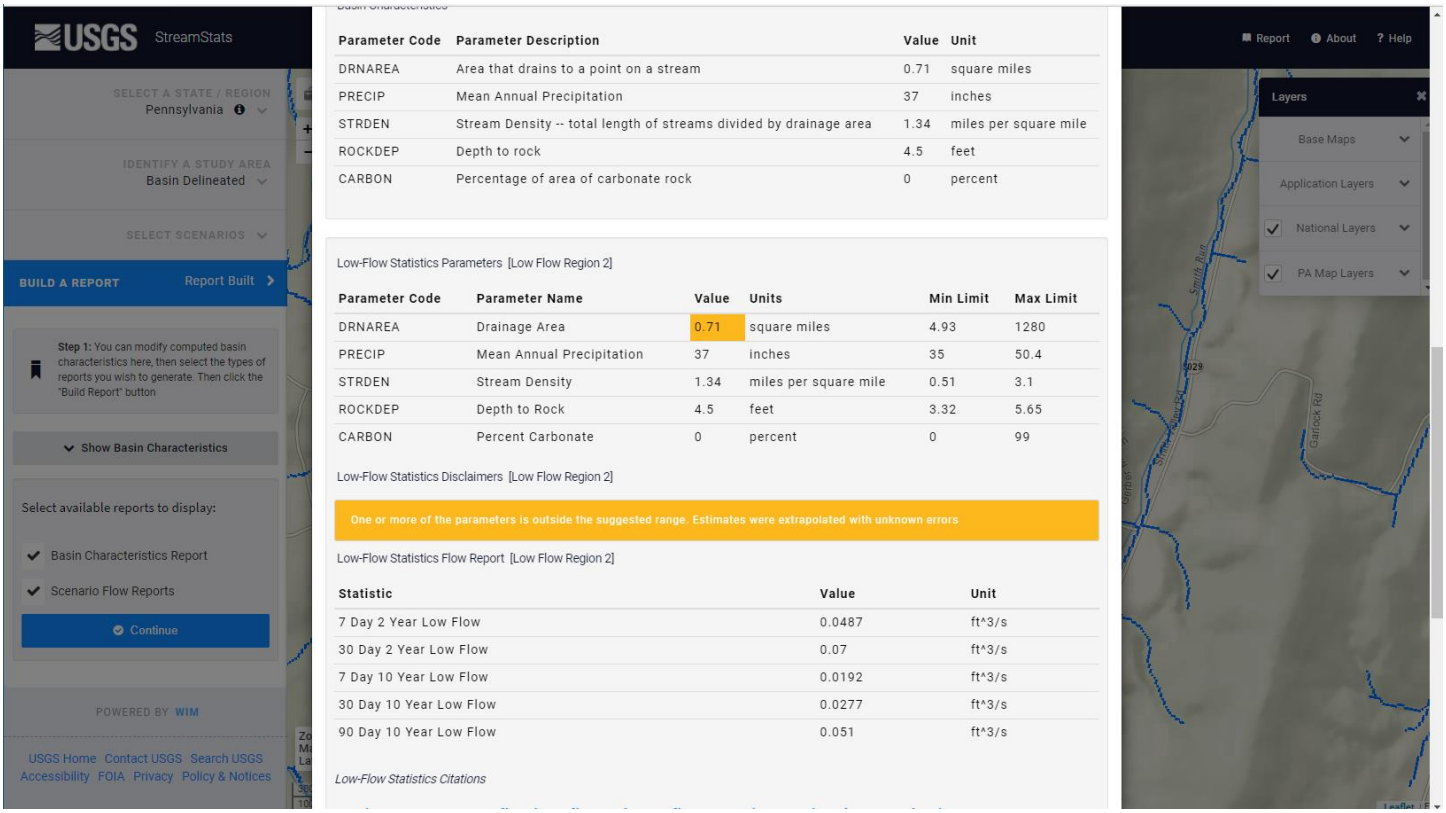
Low-Flow Statistics Disclaimers [Low Flow Region 2]

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

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

Statistic	Value	Unit
7 Day 2 Year Low Flow	0.0497	ft^3/s
30 Day 2 Year Low Flow	0.0711	ft^3/s
7 Day 10 Year Low Flow	0.0198	ft^3/s
30 Day 10 Year Low Flow	0.0284	ft^3/s
90 Day 10 Year Low Flow	0.0523	ft^3/s

Low-Flow Statistics Citations



Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.71	square miles
PRECIP	Mean Annual Precipitation	37	inches
STRDEN	Stream Density -- total length of streams divided by drainage area	1.34	miles per square mile
ROCKDEP	Depth to rock	4.5	feet
CARBON	Percentage of area of carbonate rock	0	percent

Low-Flow Statistics Parameters [Low Flow Region 2]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.71	square miles	4.93	1280
PRECIP	Mean Annual Precipitation	37	inches	35	50.4
STRDEN	Stream Density	1.34	miles per square mile	0.51	3.1
ROCKDEP	Depth to Rock	4.5	feet	3.32	5.65
CARBON	Percent Carbonate	0	percent	0	99

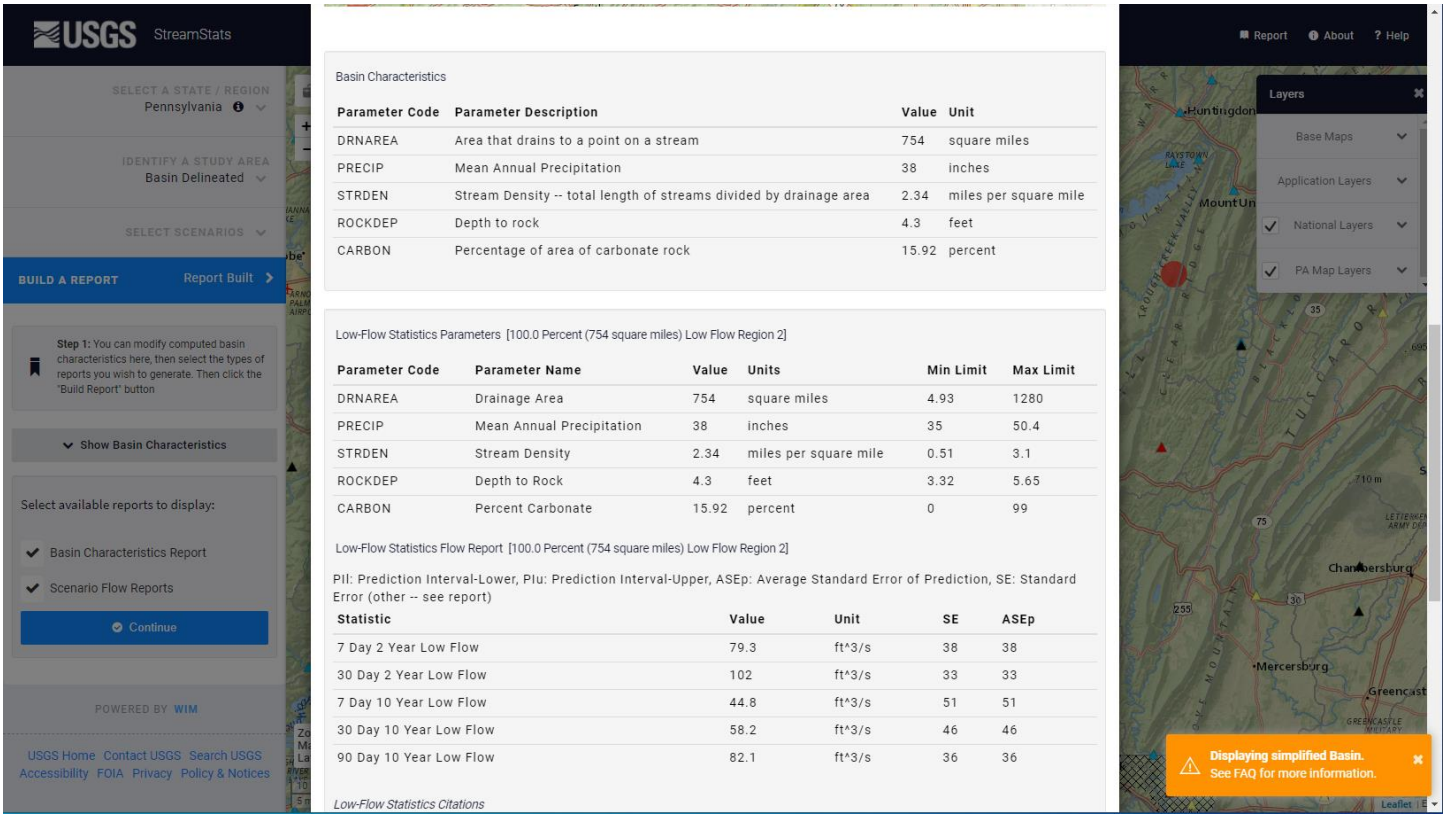
Low-Flow Statistics Disclaimers [Low Flow Region 2]

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

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

Statistic	Value	Unit
7 Day 2 Year Low Flow	0.0487	ft^3/s
30 Day 2 Year Low Flow	0.07	ft^3/s
7 Day 10 Year Low Flow	0.0192	ft^3/s
30 Day 10 Year Low Flow	0.0277	ft^3/s
90 Day 10 Year Low Flow	0.051	ft^3/s

Low-Flow Statistics Citations



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	754	square miles
PRECIP	Mean Annual Precipitation	38	inches
STRDEN	Stream Density -- total length of streams divided by drainage area	2.34	miles per square mile
ROCKDEP	Depth to rock	4.3	feet
CARBON	Percentage of area of carbonate rock	15.92	percent

Low-Flow Statistics Parameters [100.0 Percent (754 square miles) Low Flow Region 2]

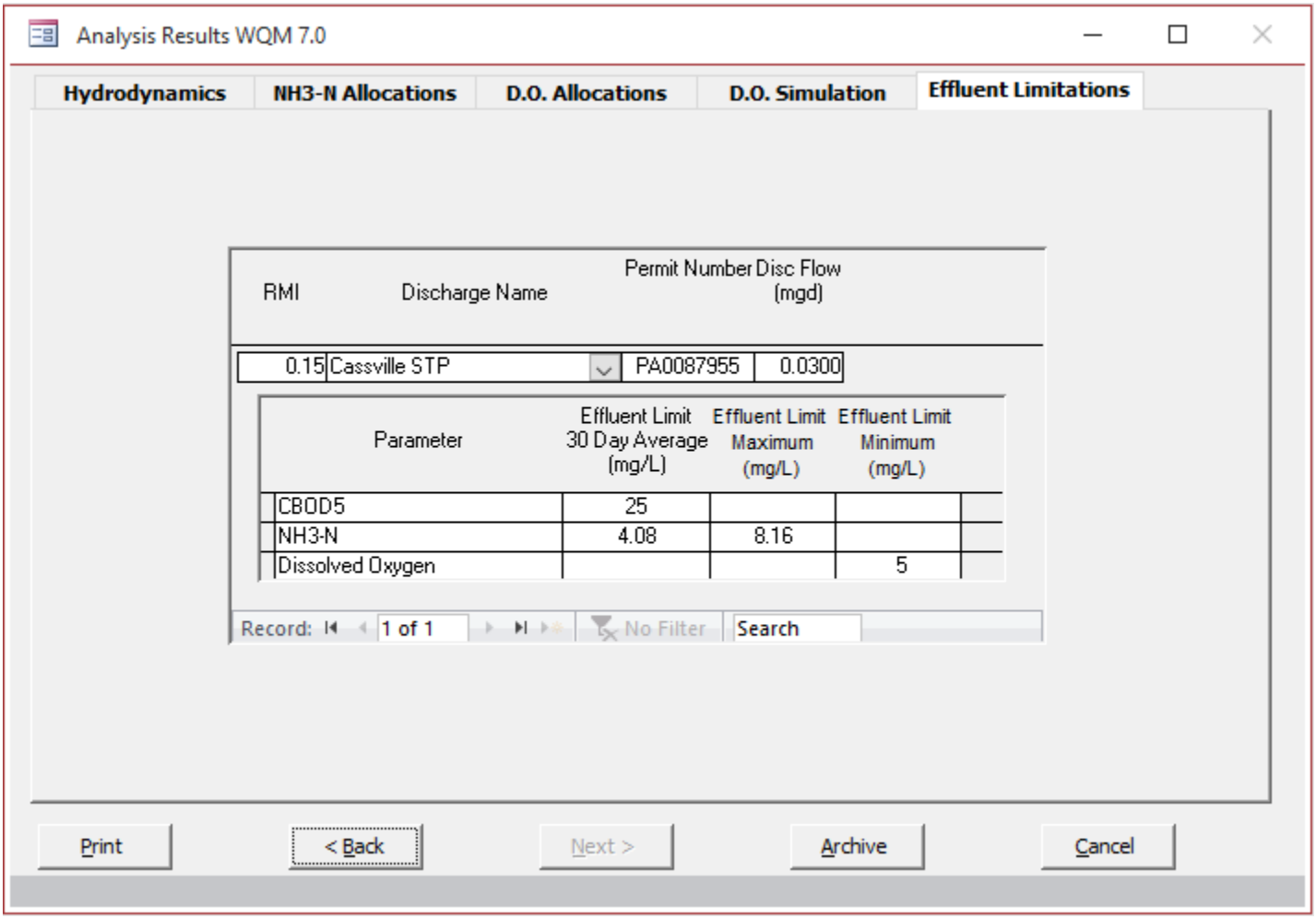
Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	754	square miles	4.93	1280
PRECIP	Mean Annual Precipitation	38	inches	35	50.4
STRDEN	Stream Density	2.34	miles per square mile	0.51	3.1
ROCKDEP	Depth to Rock	4.3	feet	3.32	5.65
CARBON	Percent Carbonate	15.92	percent	0	99

Low-Flow Statistics Flow Report [100.0 Percent (754 square miles) Low Flow Region 2]

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
7 Day 2 Year Low Flow	79.3	ft^3/s	38	38
30 Day 2 Year Low Flow	102	ft^3/s	33	33
7 Day 10 Year Low Flow	44.8	ft^3/s	51	51
30 Day 10 Year Low Flow	58.2	ft^3/s	46	46
90 Day 10 Year Low Flow	82.1	ft^3/s	36	36

Low-Flow Statistics Citations


Analysis Results WQM 7.0
Hydrodynamics
NH3-N Allocations
D.O. Allocations
D.O. Simulation
Effluent Limitations
RMI
Discharge Name
Permit Number
Disc Flow (mgd)
0.15
Cassville STP
PA0087955
0.0300
Parameter
Effluent Limit 30 Day Average (mg/L)
Effluent Limit Maximum (mg/L)
Effluent Limit Minimum (mg/L)
CBOD5
25
NH3-N
4.08
8.16
Dissolved Oxygen
5
Record: 1 of 1
No Filter
Search
Print
< Back
Next >
Archive
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rptEffLimits

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
11D	13563	Trib 13563 of Little Trough Creek

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Eff. Limit 30-day Avg. (mg/L)	Eff. Limit Maximum (mg/L)	Eff. Limit Minimum (mg/L)
0.150	Cassville STP	PA0087955	0.030	CBOD5	25		
				NH3-N	4.08	8.16	
				Dissolved Oxygen			5

Wednesday, April 13, 2022 Version 1.1 Page 1 of 1

Page: 1 No Filter

rpt_WLA

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
11D	13563	Trib 13563 of Little Trough Creek

NH3-N Acute Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
0.150	Cassville STP	16.76	25.91	16.76	25.91	0	0

NH3-N Chronic Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
0.150	Cassville STP	1.89	4.08	1.89	4.08	0	0

Dissolved Oxygen Allocations

		CBOD5		NH3-N		Dissolved Oxygen			
RMI	Discharge Name	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Critical Reach	Percent Reduction
0.15	Cassville STP	25	25	4.08	4.08	5	5	0	0

Wednesday, April 13, 2022 Version 1.1 Page 1 of 1

Page: 1 No Filter

rptDOSim

WQM 7.0 D.O. Simulation

SWP Basin	Stream Code	Stream Name
11D	13563	Trib 13563 of Little Trough Creek

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
0.150	0.030	20.000	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WD Ratio**	**Reach Velocity (fps)**
4.198	0.345	12.182	0.059
Reach CBOD5 (mg/L)	**Reach Kr (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
14.41	1.368	2.20	0.700
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.493	29.496	Owens	6
Reach Travel Time (days)			
0.153			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.015	14.11	2.18	6.89
0.031	13.81	2.15	7.07
0.046	13.52	2.13	7.24
0.061	13.23	2.11	7.38
0.077	12.95	2.08	7.48
0.092	12.68	2.06	7.56
0.107	12.41	2.04	7.62
0.123	12.15	2.02	7.67
0.138	11.89	2.00	7.72
0.153	11.64	1.98	7.75

Wednesday, April 13, 2022 Version 1.1 Page 1 of 1

Page: 1 No Filter

rptModelSpecs

WQM 7.0 Modeling Specifications

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

Wednesday, April 13, 2022 Version 1.1 Page 1 of 1

Page: 1 No Filter

rptHydro

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
11D	13553	Trib 13553 of Little Trough Creek

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope (ft/ft)	Depth (ft)	Width (ft)	WD Ratio	Velocity (fps)	Reach Trav Time (days)	Analysis Temp (°C)	Analysis pH
Q7-10 Flow												
0.150	0.04	0.00	0.04	.0464	0.00636	.345	4.2	12.18	0.05	0.153	20.00	7.00
Q1-10 Flow												
0.150	0.03	0.00	0.03	.0464	0.00636	NA	NA	NA	0.05	0.170	20.00	7.00
Q30-10 Flow												
0.150	0.05	0.00	0.05	.0464	0.00636	NA	NA	NA	0.05	0.141	20.00	7.00

Wednesday, April 13, 2022 Version 1.1 Page 1 of 1

Page: 1 No Filter

rptGeneral

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
11D	13553	Trib 13553 of Little Trough Creek	0.150	1170.00	0.66	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	0.060	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Cassville STP	PA0087955	0.0300	0.0300	0.0300	0.000	20.00	7.00

Parameter Data

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

Wednesday, April 13, 2022 Version 1.1 Page 1 of 2

Page: 1 No Filter

rptGeneral

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
11D	13553	Trib 13553 of Little Trough Creek	0.001	1165.00	0.71	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	0.060	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Cassville STP	PA0087955	0.0000	0.0000	0.0000	0.000	20.00	7.00

Parameter Data

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

Wednesday, April 13, 2022 Version 1.1 Page 2 of 2

Page: 2 No Filter

Existing Effluent Limitations and Monitoring Requirements

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
D.O.	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
$CBOD_5$	6.3	10.0	XXX	25.0	40.0	50	2/month	24-Hr Composite
BOD_5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/month	24-Hr Composite
TSS	7.5	11.3	XXX	30.0	45.0	60	2/month	24-Hr Composite
TSS Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/month	24-Hr Composite
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/month	Grab
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/month	Grab
Ammonia May 1 - Oct 31	1.0	XXX	XXX	4.0	XXX	8	2/month	24-Hr Composite
Ammonia Nov 1 - Apr 30	3.0	XXX	XXX	12.0	XXX	24	2/month	24-Hr Composite

Existing Effluent Limitations and Monitoring Requirements

Outfall 001, Chesapeake Bay Requirements,

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Monthly	Annual	Monthly	Monthly Average	Maximum	Instant. Maximum		
Ammonia--N	Report Total Qrtly	Report	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	24-Hr Composite
Kjeldahl--N	Report Total Qrtly	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	24-Hr Composite
Nitrate-Nitrite as N	Report Total Qrtly	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	24-Hr Composite
Total Nitrogen	Report Total Qrtly	Report	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	Calculation
Total Phosphorus	Report Total Qrtly	Report	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	24-Hr Composite

Proposed Effluent Limitations and Monitoring Requirements

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

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
D.O.	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
$CBOD_5$	6.3	10.0	XXX	25.0	40.0	50.0	2/month	24-Hr Composite
BOD_5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/month	24-Hr Composite
TSS	7.5	11.3	XXX	30.0	45.0	60.0	2/month	24-Hr Composite
TSS Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/month	24-Hr Composite
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	2/month	Grab
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2,000 Geo Mean	XXX	10,000	2/month	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/year	Grab
Ammonia May 1 - Oct 31	1.0	XXX	XXX	4.0	XXX	8.0	2/month	24-Hr Composite
Ammonia Nov 1 - Apr 30	3.0	XXX	XXX	12.0	XXX	24.0	2/month	24-Hr Composite

Compliance Sampling Location:

Other Comments:

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, Chesapeake Bay Requirements, 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
	Monthly	Annual	Monthly	Monthly Average	Maximum	Instant. Maximum		
Ammonia--N	Report Total Qrtly	Report	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	24-Hr Composite
Kjeldahl--N	Report Total Qrtly	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	24-Hr Composite
Nitrate-Nitrite as N	Report Total Qrtly	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	24-Hr Composite
Total Nitrogen	Report Total Qrtly	Report	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	Calculation
Total Phosphorus	Report Total Qrtly	Report	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	24-Hr Composite

Compliance Sampling Location:

Other Comments:

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:
☐	Other: