

Application Type Amendment, Major
 Facility Type Municipal
 Major / Minor Major

**NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE**

Application No. PA0104442 A-1
 APS ID 990268
 Authorization ID 1268069

Applicant and Facility Information

Applicant Name	<u>Breakneck Creek Regional Authority</u>	Facility Name	<u>Breakneck Creek STP</u>
Applicant Address	<u>1166 Mars Evans City Road</u> <u>Mars, PA 16046-2216</u>	Facility Address	<u>1166 Mars Evans City Road</u> <u>Mars, PA 16046-2216</u>
Applicant Contact	<u>Michael Davidson</u>	Facility Contact	<u></u>
Applicant Phone	<u>(724) 625-1699</u>	Facility Phone	<u></u>
Client ID	<u>44306</u>	Site ID	<u>259094</u>
Ch 94 Load Status	<u>Not Overloaded</u>	Municipality	<u>Adams Township</u>
Connection Status	<u>No Limitations</u>	County	<u>Butler</u>
Date Application Received	<u>March 1, 2019</u>	EPA Waived?	<u>No</u>
Date Application Accepted	<u>April 4, 2019</u>	If No, Reason	<u>Major Facility</u>
Purpose of Application	<u>NPDES Permit amendment to upgrade the plant from 3.0 MGD to 4.5 MGD.</u>		

Summary of Review

The permittee wishes to upgrade their plant for future growth to increase the hydraulic design capacity. The need to upgrade the plant was based on projections regarding future growth identified in the Official Sewage Facilities Plan Update submitted to the Department in December 2018. The Plan Update was approved by the Department on March 5, 2019.

Any expanded flow from this discharge will further potentially contribute to Breakneck Creek being effluent-dominated by this discharge and potentially causing adverse impacts to aquatic life in Breakneck Creek. Thus, more stringent effluent limitations are being imposed in an attempt to protect the stream from further degradation.

There are currently no open violations listed in EFACTS for this permittee (7/26/2019).

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		Adam J. Pesek, E.I.T. / Environmental Engineering Specialist	
X		Justin C. Dickey, P.E. / Environmental Engineer Manager	

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	<u>001</u>	Design Flow (MGD)	<u>4.5</u>
Latitude	<u>40° 43' 18.45"</u>	Longitude	<u>80° 1' 36.66"</u>
Quad Name	<u>Mars</u>	Quad Code	<u>1305</u>
Wastewater Description: <u>Treated domestic sewage</u>			
Receiving Waters	<u>Breakneck Creek</u>	Stream Code	<u>35016</u>
NHD Com ID	<u>126220319</u>	RMI	<u>8.1</u>
Drainage Area	<u>19.829</u>	Yield (cfs/mi ²)	<u>0.0428</u>
Q ₇₋₁₀ Flow (cfs)	<u>0.848</u>	Q ₇₋₁₀ Basis	<u>USGS #03049000 (1977 – 2011)</u>
Elevation (ft)	<u>973</u>	Slope (ft/ft)	<u>0.00158</u>
Watershed No.	<u>20-C</u>	Chapter 93 Class.	<u>WWF</u>
Existing Use	<u></u>	Existing Use Qualifier	<u></u>
Exceptions to Use	<u></u>	Exceptions to Criteria	<u></u>
Assessment Status	<u>Impaired</u>		
Cause(s) of Impairment	<u>Cause Unknown, Siltation</u>		
Source(s) of Impairment	<u>Source Unknown, Urban Runoff/Storm Sewers</u>		
TMDL Status	<u></u>	Name	<u></u>
Background/Ambient Data		Data Source	
pH (SU)	<u>7.81</u>	Department sample upstream of discharge on 8/31/2006	
Temperature (°C)	<u>25</u>	Default (WWF)	
Hardness (mg/L)	<u>100</u>	Default	
Other: NH ₃ -N	<u>0.1</u>	Default	
Nearest Downstream Public Water Supply Intake	<u>PA American Water Company – Ellwood</u>		
PWS Waters	<u>Connoquenessing Creek</u>	Flow at Intake (cfs)	<u>67</u>
PWS RMI	<u>0.01</u>	Distance from Outfall (mi)	<u>33.1</u>

Changes Since Last Permit Issuance: Stream pH and discharge coordinates were revised.

Other Comments: An emergency Sanitary Sewer Overflow (002) exists but cannot be expressly acknowledged in the NPDES Permit because bypassing of secondary treatment is prohibited. It originates prior to headworks and does have its own chlorination system. Stormwater Outfalls 003 and 004 also discharge to Breakneck Creek:

Outfall No.	<u>003</u>	RMI	<u>8.2</u>
Latitude	<u>40° 43' 19"</u>	Longitude	<u>80° 1' 31"</u>

Outfall No.	<u>004</u>	RMI	<u>8.1</u>
Latitude	<u>40° 43' 17 "</u>	Longitude	<u>80° 1' 40"</u>

Treatment Facility Summary				
Treatment Facility Name: Breakneck Creek STP				
WQM Permit No.		Issuance Date		
1091403		April 12, 1991		
1002401 A-1		March 4, 2013		
Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary With Ammonia And Phosphorus	Sequencing Batch Reactor	Ultraviolet	3.0
Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
3.0	5504	Not Overloaded	Aerobic Digestion	Landfill

Changes Since Last Permit Issuance:

Other Comments: A WQM Permit/Amendment is expected after the permit is drafted/finalized. Little is known about the proposed upgrades to the plant to accommodate the increased design hydraulic capacity of the plant at this time. The consult indicated though that it will utilize UV disinfection, the design hydraulic capacity will be 4.5 MGD, and the design organic capacity will be 11,450 lbs/day.

Compliance History

DMR Data for Outfall 001 (from June 1, 2018 to May 31, 2019)

Parameter	MAY-19	APR-19	MAR-19	FEB-19	JAN-19	DEC-18	NOV-18	OCT-18	SEP-18	AUG-18	JUL-18	JUN-18
Flow (MGD) Average Monthly	2.134	1.989	1.716	2.083	1.885	2.301	2.074	1.768	1.974	1.589	1.519	1.612
Flow (MGD) Daily Maximum	8.259	3.228	2.359	3.693	2.833	3.084	3.174	2.554	3.666	1.970	1.691	1.893
pH (S.U.) Minimum	6.5	6.4	6.4	6.3	6.4	6.5	6.4	6.6	6.7	6.8	6.7	6.6
pH (S.U.) Maximum	7.0	7.0	6.8	6.9	6.8	7.1	6.9	7.1	8.3	7.1	7.1	7.0
DO (mg/L) Minimum	6.9	8.1	8.5	8.1	7.8	7.8	6.2	7.4	6.4	7.3	7.4	7.4
CBOD5 (lbs/day) Average Monthly	< 86	< 59	< 41	< 72	< 52	< 70	< 77	< 44	< 56	< 83	< 82	< 66
CBOD5 (lbs/day) Weekly Average	336	< 84	< 44	106	< 62	< 119	< 115	< 51	< 70	137	118	112
CBOD5 (mg/L) Average Monthly	< 5	< 4	< 3	< 4	3	< 5	< 4	< 3	< 3	< 6	< 6	< 5
CBOD5 (mg/L) Weekly Average	13	< 6	< 3	5	< 4	< 9	< 6	3	< 4	10	10	8
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	1730	2166	1740	3415	2568	1724	2711	1385	2107	2922	2814	2390
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	3827	2941	2925	9388	4365	3465	6093	2230	4361	4190	5449	3234
BOD5 (mg/L) Raw Sewage Influent Average Monthly	118	156	127	164	172	110	148	97	122	218	221	174
TSS (lbs/day) Average Monthly	< 149	< 70	69	< 103	< 79	< 76	< 88	< 71	< 84	< 67	< 64	< 67
TSS (lbs/day) Raw Sewage Influent Average Monthly	3152	2480	2287	3540	2746	2362	1779	1680	2216	2480	2036	3136

**NPDES Permit Fact Sheet
Breakneck Creek STP**

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TSS (lbs/day) Raw Sewage Influent Daily Maximum	4048	3306	2987	8932	4017	3480	3599	2936	3896	3433	3648	5016
TSS (lbs/day) Weekly Average	560	< 73	< 73	< 122	< 97	< 88	< 90	< 86	< 96	< 71	< 68	< 72
TSS (mg/L) Average Monthly	< 8	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
TSS (mg/L) Raw Sewage Influent Average Monthly	216	178	166	180	178	162	105	121	135	183	161	234
TSS (mg/L) Weekly Average	21	< 5	< 5	< 6	< 5	< 5	< 5	< 5	< 6	< 5	< 5	< 5
Total Dissolved Solids (lbs/day) Average Quarterly			16730			7358			6419			6954
Total Dissolved Solids (mg/L) Average Quarterly			691			406			507			502
Fecal Coliform (CFU/100 ml) Geometric Mean	2	3	2	6	5	5	11	10	35	48	33	7
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	5	14	10	38	84	25	190	291	244	461	79	20
UV Intensity (µw/cm ²) Average	64	68.7	66.4	78.5	65.2	59.6	53.4	71.8	62.5	54.3	48.5	51.7
Total Nitrogen (lbs/day) Average Quarterly			48			140			61			47
Total Nitrogen (mg/L) Average Quarterly			1.98			7.7			4.82			3.38
Ammonia (lbs/day) Average Monthly	< 26.4	< 11.2	< 11.0	< 32.1	< 22.0	< 15.9	< 16.5	< 11.4	< 15.8	< 10.8	< 10.2	< 10.7
Ammonia (mg/L) Average Monthly	< 1.4	< 0.8	< 0.8	< 1.6	< 1.3	< 1.1	< 0.9	< 0.8	< 0.9	< 0.8	< 0.8	< 0.8
Total Phosphorus (lbs/day) Average Monthly	< 13	< 2	< 2	< 4	6	< 2	9	13	< 8	< 10	12	12
Total Phosphorus (mg/L) Average Monthly	< 0.7	< 0.1	< 0.1	< 0.2	0.4	< 0.2	0.5	0.9	< 0.5	< 0.8	1.0	0.9

Development of Effluent Limitations

Outfall No. <u>001</u>	Design Flow (MGD) <u>4.5</u>
Latitude <u>40° 43' 18.45"</u>	Longitude <u>80° 1' 36.66"</u>
Wastewater Description: <u>Treated domestic sewage</u>	

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)
Phosphorus, Total	2.0	Average Monthly		96.5

Comments: The phosphorus limit is implemented for all dischargers to the Connoquenessing Creek basin above the confluence with Slippery Rock Creek

Water Quality-Based Limitations

A “Reasonable Potential Analysis” done for the last NPDES Permit renewal determined the following parameters were candidates for limitations: Total Dissolved Solids (TDS) and phenolics.

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

Parameter	Limit (mg/l)	SBC	Model
CBOD ₅	10	Average Monthly	WQM 7.0 Version 1.0b
Ammonia Nitrogen (5/01-10/31)	1.5	Average Monthly	WQM 7.0 Version 1.0b
Dissolved Oxygen	5.0	Minimum	WQM 7.0 Version 1.0b0

Comments: A seasonal multiplier of 3 is used for the ammonia nitrogen wintertime limit.

A public water supply evaluation (attached) was conducted for phenolics and TDS. The downstream public water supply was found to be protected and no limits are needed for these parameters.

Best Professional Judgment (BPJ) Limitations

Comments: Monitoring for influent TSS and BOD₅ were placed in the permit in accordance with the Department’s SOP entitled “New and Reissuance Sewage Individual NPDES Permit Applications.”

Monitoring for ultraviolet intensity was placed in the permit in accordance with the Department’s SOP entitled “Establishing Effluent Limitations for Individual Sewage Permits.”

Tertiary treatment limits found in the Department's DEP's "Policy and Procedure for Evaluating Wastewater Discharges of Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers" (391-2000-014) are to be applied for new and expanding discharges where there is less than three-parts stream flow (Q_{7-10}) to one-part effluent (design flow) in accordance with the Department's SOP entitled "Establishing Effluent Limitations for Individual Sewage Permits." The tertiary limits found in the above-mentioned document that are applicable to this expanding discharge are as follows:

Parameter	Limit (mg/l)	SBC
CBOD ₅	10	Average Monthly
TSS	10	Average Monthly
Total Nitrogen	5.0	Average Monthly
Dissolved Oxygen	6.0	Daily Minimum
Total Phosphorus	0.5	Average Monthly

Quarterly monitoring for TDS was placed in the permit as suggested in a special study done by the Department entitled "Determination of TDS WQBEL for New Castle POTW," dated September 12, 2011, for discharges in the watershed that have average daily TDS loadings between 5,000 and 10,000 lbs/day. The projected average daily TDS loading was found by correlating the current design flow (3.0 MGD) and the current average discharge loading from the 2016 NPDES Permit renewal application (6,215 lbs/day) with the proposed design flow. $(4.5 \times 6215) / 3.0 = 9322$ lbs/day is projected TDS loading.

Additional Considerations

No monitoring requirements were put in place for the stormwater outfalls. The discharges from Outfall 003 and 004 should consist of uncontaminated stormwater runoff only.

No requirements are applicable under Chapter 95.10 for this proposed upgrade.

If the total nitrogen BPJ limit of 5 mg/l as an average monthly is consistently met, the WQBELs for ammonia nitrogen should be met consistently due to the high degree of nitrification/denitrification required to meet the total nitrogen limit. Regardless, since the Department's SOP entitled "Establishing Effluent Limitations for Individual Sewage Permits" suggests at least monitoring be done for ammonia nitrogen in all cases and a limit was calculated that is less than the technology-based ammonia nitrogen and the total nitrogen limit, ammonia nitrogen WQBELs will be placed in the permit.

Flow equalization of the discharge should be implemented in any proposed plant upgrades due to the effluent dominated scenario in order to limit stream velocity and minimize the possibility of progressive scouring of the stream channel.

Anti-Backsliding

Some backsliding of effluent limits is occurring with the final limits after the plant upgrades are complete. This is allowed due to there being a substantial alteration occurring to the treatment plant and the design hydraulic capacity is increasing.

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	Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	9.0 Daily Max	XXX	1/day	Grab
DO	XXX	XXX	6.0 Daily Min	XXX	XXX	XXX	1/day	Grab
BOD5 Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	2/week	24-Hr Composite
TSS Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Total Dissolved Solids	Report Avg Qrtly	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	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 Intensity (µw/cm²)	XXX	XXX	XXX	Report	XXX	XXX	1/day	Measured

Compliance Sampling Location: Outfall 001 (after disinfection)

Other Comments:

Proposed Effluent Limitations and Monitoring Requirements

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Outfall 001, Effective Period: Startup of New or Upgraded Facilities 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		
CBOD5	375	560	XXX	10.0	15.0	20	2/week	24-Hr Composite
TSS	375	560	XXX	10.0	15.0	20	2/week	24-Hr Composite
Total Nitrogen	185	XXX	XXX	5.0	XXX	10	2/week	24-Hr Composite
Ammonia Nov 1 - Apr 30	165	XXX	XXX	4.5	XXX	9	2/week	24-Hr Composite
Ammonia May 1 - Oct 31	56	XXX	XXX	1.5	XXX	3	2/week	24-Hr Composite
Total Phosphorus	18	XXX	XXX	0.5	XXX	1	2/week	24-Hr Composite

Compliance Sampling Location: Outfall 001 (after disinfection)

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, Effective Period: Permit Effective Date through Startup of New or Upgraded Facilities.

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		
CBOD5 Nov 1 - Apr 30	375	575	XXX	15	23	30	2/week	24-Hr Composite
CBOD5 May 1 - Oct 31	250	375	XXX	10	15	20	2/week	24-Hr Composite
TSS	751	1126	XXX	30	45	60	2/week	24-Hr Composite
Total Nitrogen	Report Avg Qrtly	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	24-Hr Composite
Ammonia Nov 1 - Apr 30	82.6	XXX	XXX	3.3	XXX	6.6	2/week	24-Hr Composite
Ammonia May 1 - Oct 31	37.5	XXX	XXX	1.5	XXX	3	2/week	24-Hr Composite
Total Phosphorus	50	XXX	XXX	2.0	XXX	4	2/week	24-Hr Composite

Compliance Sampling Location: Outfall 001 (after disinfection)

Other Comments: