pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0100650**
Facility Type	**Non-Municipal**	APS ID	**974456**
Major / Minor	**Minor**	Authorization ID	**1239592**

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Forrest Brooke MHC LLC**	Facility Name	**Forrest Brooke MHP**
Applicant Address	PO Box 1105	Facility Address	7224 West Market Street
	Hermitage, PA 16148-0105		Mercer, PA 16137
Applicant Contact	Kim Havens	Facility Contact	Jeffrey H. Staul
	Park Manager		Operator (Staul's Water Technology)
Applicant Phone	(724) 981-9911	Facility Phone	724-662-4706
Client ID	267675	Site ID	244047
Municipality	Lackawannock Township	County	Mercer
Ch 94 Load Status	Not Overloaded	Connection Status	No Limitations
SIC Code	**6515**	SIC Code	4952
SIC Description	**Fin, Ins & Real Est-Mobile Home Site Opers**	SIC Description	Trans. & Utilities - Sewerage Systems
Application Received	July 23, 2018	EPA Waived?	Yes
Application Accepted	September 21, 2018	If No, Reason	

Purpose of Application: NPDEs renewal

Summary of Review

EFACTs© Status: In compliance as of June 23, 2015. The self-monitoring report summary includes high effluent TSS, fecal coliform, ammonia, and phosphorus. The renewal was prepared by Jeffrey Staul the plant operator and discussed with him on January 7, 2020 when a sludge generation and disposal report was requested. The reported disposal site was the Hermitage STP.

Previous TRC reviews used a discharge chlorine demand. A 0.01-mg/L TRC monthly average limitation is proposed that requires Standard Methods: 4500 Amperometric titration analysis or equivalent monitoring.

Public Participation

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

Approve	Deny	Signatures	Date
X		William H. Mentzer, P.E. Environmental Engineering Specialist	January 8, 2020
X		Justin C. Dickey, P.E. Environmental Engineer Manager	

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.072
Latitude DP	41º 14' 9.02"	Longitude DP	-80º 21' 14.14"
Latitude NHD	41º 14' 9.55"	Longitude NHD	-80º 21' 14.48"
Quad Name	Greenfield	Quad Code	0903
Wastewater:	Treated mobile home park domestic wastes		

Receiving Waters	Unnamed Tributary to Magargee Run	Stream Code	36056
NHD Com ID	130026609	RMI	0.9300
Drainage Area	0.22	Yield (cfs/mi^2)	0.02
Q_{7-10} Flow (cfs)	0.0044-cfs	Q_{7-10} Basis	Shenango River
Elevation (ft)	1223.42	Slope (ft/ft)	0.02889
Watershed No.	20-A	Chapter 93 Class.	WWF
Existing Use	**statewide**	Existing Use Qualifier	none
Exceptions to Use	none	Exceptions to Criteria	none
Comments	Impairment action reserved pending further guidance from our central office.		

Low stream flow	Is the average yield of the Turnerville and New Castle Shenango River gauge stations						
	Low flow (cfs)	Turnerville	3.4	Drainage (sq mi)	152	Yield (cfs/sq-mi)	0.0230
	Low flow (cfs)	N Castle	792	Drainage (sq mi)	14	Yield (cfs/sq-mi)	0.0175
	Low flow (cfs)	mean		Drainage (sq mi)		Yield (cfs/sq-mi)	0.0203
Low Flow Commen	The mean yield is normally rounded to 0.02-cfs/square-mile						

Assessment Status	Impaired
Impairment Cause	Nutrients
Impairment Source	Package plant or other permitted small flows discharges
TMDL Status	Name

Background/Ambient Data		Data Source
pH (SU)	8.1	1998 Shenango Reservoir TSI Study
Temperature (°C)	25	WWF default
CBOD5 (mg/L)	0.7	1998 Shenango Reservoir TSI Study
Ammonia:	0.02	1998 Shenango Reservoir TSI Study

Nearest Downstream Public Water Supply Intake	Aqua Pa		
PWS Waters	Shenango River	Flow at Intake (cfs)	NA
PWS RMI	29.45	Distance from Outfall (mi)	15.37

Changes Since Last Permit Issuance:
The firs5t downstream water intake was formerly at Sharpsville by the Sharpsville Municipal Water Company. This facility has been taken over by Aqua Pa and the intake has been abandoned. The next downstream public water intake is by Aqua Pa (Shenango Valley).

Other Comments: No water supply impairments are expected.

Treatment Facility Summary				
Treatment Facility Name: Forrest Brooke MHP				
WQM Permit No.	**Issuance Date**			
4399416	August 23, 1999			
4373410	November 28, 1973			
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Secondary With Ammonia And Phosphorus	Activated Sludge	chlorination	0.072
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.072	160.31	Not Overloaded	Aerobic Digestion	Other WWTP

Changes Since Last Permit Issuance: none

Other Comments: comminutor with bar screen bypass, separate stage CBOD and Nitrogenous reduction, chemical addition for phosphorus control, disinfection, post aeration (Stripping), and aerobic sludge digestion

Disinfection is sodium hypochlorite as described in WQM permit application 4373410.

				Influent	Effluent		
			MGD	PPD			
Hydraulic Design Capacity			**0.072**				
Organic Design Capacity				**160.31**			
Annual Average Flow		**2018**	**0.014**				
		2017	**0.0163**				
		2016	**0.0223**				
Highest Monthly Average	**January**	**2018**	**0.0294**				
pH				**6.4**		**8.5**	**384**
TRC					**0.31**	**0.86**	**192**
Fecal Coliform					**150**	**1554**	**50**
CBOD5					**5.3**	**19.1**	**50**
TSS					**16.9**	**43.0**	**50**
Ammonia					**2.06**	**10.6**	**50**
N					**17.7**	**37.8**	**50**
P					**0.82**	**2.96**	**48**

TSS is higher than CBOD and the discharge is less than half the design flow.
Ammonia and phosphorus maximums exceed the permitted daily maximums.
The reported fecal coliform maximum is higher than the allowed summer maximum.
TRC data does not support the proposed lower TRC requirements.

Chemicals used:
Liquid chlorine (disinfection)
Alum (phosphorus control)

Sludge removal was not reported and has been requested.

Compliance History

DMR Data for Outfall 001 (from December 1, 2018 to November 30, 2019)

Parameter	NOV-19	OCT-19	SEP-19	AUG-19	JUL-19	JUN-19	MAY-19	APR-19	MAR-19	FEB-19	JAN-19	DEC-18
Flow (MGD) Average Monthly	0.008	0.009	0.01	0.010	0.010	0.012	0.006	0.011	0.013	0.016	0.017	0.012
pH (S.U.) Minimum	7.3	7.3	7.3	7.0	6.8	6.7	6.7	6.7	7.0	6.6	6.3	6.8
pH (S.U.) Maximum	7.7	8.2	8.2	7.5	7.8	8.2	7.1	7.9	7.6	7.8	7.7	6.9
DO (mg/L) Minimum	8.4	7.1	7.6	6.3	6.4	6.2	6.3	7.3	6.5	10.1	7.0	7.4
TRC (mg/L) Average Monthly	**0.37**	**0.14**	**0.34**	**0.16**	**0.24**	**0.14**	**0.31**	**0.37**	**0.35**	**0.37**	**0.30**	**0.26**
TRC (mg/L) Instantaneous Maximum	0.61	0.31	0.82	0.31	0.30	0.28	0.58	0.58	0.81	0.80	0.43	0.68
CBOD5 (mg/L) Average Monthly	< 2.4	< 4.7	< 2.4	< 2.4	< 2.4	2.5	< 2.2	2.0	3.5	8	< 2.4	3.0
TSS (mg/L) Average Monthly	14	17	26	9	11	22.5	28	**34**	**33.5**	**53.5**	13	8.5
Fecal Coliform (#/100 ml) Geometric Mean	2	< 10	< 3	175	< 3	**1365**	6.0	< 1.8	28.1	> 49.2	23.3	> 1118.5
Fecal Coliform (#/100 ml) Instantaneous Maximum	2	95.9	9.6	**1120**	7.4	**2419.6**	8.5	3.1	152.3	> 2419.6	73.3	> 2419
Total Nitrogen (mg/L) Average Monthly	< 21.6	8	< 18	< 12	< 29	16	< 18	< 5	3	< 9	14	18.3
Ammonia (mg/L) Average Monthly	0.3	0.2	0.3	0.3	0.2	0.5	0.4	0.8	2.6	**4.7**	4.4	0.4
Total Phosphorus (mg/L) Average Monthly	0.3	0.5	**1.3**	0.17	0.3	0.3	0.3	0.4	0.3	0.6	0.3	0.3

Low flow and high TSS/CBOD ratio
The proposed TRC limitations do not appear achievable.

Compliance History

Effluent Violations for Outfall 001, from: January 1, 2019 To: November 30, 2019

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
TSS	**02/28/19**	**Avg Mo**	**53.5**	**mg/L**	**30**	**mg/L**
TSS	03/31/19	Avg Mo	33.5	mg/L	30	mg/L
TSS	04/30/19	Avg Mo	34	mg/L	30	mg/L
Fecal Coliform	06/30/19	Geo Mean	1365	CFU/100 ml	200	CFU/100 ml
Fecal Coliform	**06/30/19**	**IMAX**	**2419.6**	**CFU/100 ml**	**1000**	**CFU/100 ml**
Fecal Coliform	08/31/19	IMAX	1120	CFU/100 ml	1000	CFU/100 ml
Ammonia	02/28/19	Avg Mo	4.7	mg/L	4.5	mg/L
Total Phosphorus	09/30/19	Avg Mo	1.3	mg/L	1.0	mg/L

Summary of Inspections: No known current inspections

Other Comments:

The February 28 TSS value significantly exceeds the permit daily maximum and the March 31 and April 30 TSS marginally exceed the monthly mean.
The February 28 Ammonia average monthly value marginally exceeds the permit requirement.
A February upset is possible with a two-month adjustment to normal operation based on reported TSS and ammonia data.
.
Phosphorus compliance may be marginal based on monitoring frequency, facility size and installed controls.

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.072
Latitude 41º 14' 9.02" **Longitude** -80º 21' 14.14"
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©	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)
DO	4.0	Daily minimum		BPJ

Comments: The above weekly values are for POTWs.

Water Quality-Based Limitations

A "Reasonable Potential Analysis" based on the Sewerage Program determined the following parameters were candidates for limitations: Phosphorus, CBOD, TSS, ammonia, and DO.

Stream Flow

Because of the low swampy terrain and no USGS intermittent stream flow indication, perennial stream flow is implied.

The modelling stream flow was determined from average the Shenango River gage station yields at New Castle and Turnerville. The Shenango River at New Castle data is for 1911 through 1934. The Shenango River at Turnerville data period is unknown and predates the Pymatuning Reservoir start-up. The Department of Interior Stream Stats provides a lower statistical basin seven day-ten-year low flow. The correlated Shenango River yield is 0.02-cfs per square mile or 0.0044-cfs and the statistical low flow is 0.00014-cfs.

Review

Phosphorus requirements at 1.0-mg/L are from the 1998 Trophic State Analysis, Shenango Reservoir, Mercer County, dated June 23, 1999. Data was collected in 1997 and 1998. The collected stream 5-day CBOD, ammonia and pH data was used in WQM7.0 modelling.

5-day CBOD, ammonia, and DO were evaluated together using WQM7.0. Secondary treatment with ammonia control is recommended.

Total residual chlorine was evaluated using the current central office created spreadsheet. This spreadsheet does not use a discharge chlorine demand previously regionally used and consequently recommends lower chlorine water-quality based limitations. The model does use an assumed 0.3-mg/L instream chlorine demand that may be verified by site specific studies.

Comments:

Previous reviews determined that the receiving waters were nutrient impaired by this discharge and further action was reserved pending new guidance development.

Chlorine Monitoring

Chlorine monitoring below 0.1-mg/L is to use: EPA 330.5 Spectrophotometric (SM 4500-Cl E Low Level Amperometric Titration) with a 0.010-mg/L detection level, DPD (SM 4500-Cl G, DPD Colorimetric Method) with a 0.010-mg/L detection level or EPA 330.4 Titrimetric DPD-FAS (SM 4500-Cl F, DPD Ferrous Titrimetric Method) with a 0.018-mg/l detection level. The chlorine qualification levels should be somewhat higher than the reported detection levels.

The Amperometric method is from the Departments chlorine guidance. The other two methods are from the Clean Water Chlorine monitoring condition TRC EFFLUENT LIMITATIONS BELOW QUANTITATION LIMITS listed in Part C of the NPDES permit.

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

Parameter		Discharge	Limit (mg/l)			SBC	Model		
	period	pH	min	mean	max		min	mean	max
phosphorus				1.0	2.0			1.0	2.0
CBOD5				25.0	50.0			25.0	50.0
Ammonia[0]	summer	7.2		1.5	3.0			1.74	
Ammonia[0]	winter	7.2		4.5	9.0				
Ammonia[1]	summer	7.4		1.5	3.0			1.55	
Ammonia[1]	winter	7.4		4.5	9.0				
Ammonia[2]	summer	7.4		1.5	3.0			1.52	
Ammonia[2]	winter	7.4		4.5	9.0				
Ammonia[3]	summer	7.4		1.5	3.0			1.52	
Ammonia[3]	winter	7.4		4.5	9.0				
DO			5.0				5.0		
TRC[1]				0.01	0.05			0.014	0.047
TRC[2]				0.01	0.03			0.009	0.031
TRC[3]				0.01	0.03			0.008	0.027

0 – 0.22-square mile drainage area based (previous model verification)
1 - 0.22-square mile drainage area based
2 - 0.0366-square mile drainage area based
3 - 0.0366-square mile drainage area and 0.000144-cfs low flow based
CBOD5 and DO did not vary with drainage area, discharge pH or stream flow.

The TRC monthly requirements have been rounded to detectable levels. The maximum TRC value is rounded to 0.03-mg/L.

Based on the reduced stream flow the ammonia requirements are reduced from 1.74-mg/L to 1.55-mg/L. With down ward rounding to the half milligram per liter no ammonia changes are proposed.

Anti-Backsliding

As the water-quality requirements have not been relaxed, back sliding was not considered.

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 December 31, 2022.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	Report	XXX	XXX	XXX	XXX	XXX	1/week	Measured
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	5.0 Daily Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.37	XXX	0.87	1/day	Grab
CBOD5	XXX	XXX	XXX	25.0	XXX	50.0	2/month	8-Hr Composite
TSS	XXX	XXX	XXX	30.0	XXX	60.0	2/month	8-Hr Composite
Fecal Coliform Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/month	Grab
Fecal Coliform May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/month	Grab
Total Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Ammonia Nov 1 - Apr 30	XXX	XXX	XXX	4.5	XXX	9.0	2/month	8-Hr Composite
Ammonia May 1 - Oct 31	XXX	XXX	XXX	1.5	XXX	3.0	2/month	8-Hr Composite
Total Phosphorus	XXX	XXX	XXX	1.0	XXX	2.0	2/month	8-Hr Composite

Compliance Sampling Location: Outfall 001 after disinfection

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: January 1, 2023 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	Average Weekly	Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	Report	XXX	XXX	XXX	XXX	XXX	1/week	Measured
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	5.0 Daily Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.01	XXX	0.03	1/day	Grab
CBOD5	XXX	XXX	XXX	25.0	XXX	50.0	2/month	8-Hr Composite
TSS	XXX	XXX	XXX	30.0	XXX	60.0	2/month	8-Hr Composite
Fecal Coliform Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/month	Grab
Fecal Coliform May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/month	Grab
Total Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Ammonia Nov 1 - Apr 30	XXX	XXX	XXX	4.5	XXX	9.0	2/month	8-Hr Composite
Ammonia May 1 - Oct 31	XXX	XXX	XXX	1.5	XXX	3.0	2/month	8-Hr Composite
Total Phosphorus	XXX	XXX	XXX	1.0	XXX	2.0	2/month	8-Hr Composite

Compliance Sampling Location: Outfall 001 after disinfection