pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northwest Regional Office
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Application Type	**Renewal**	Application No.	**PA0239569**
Facility Type	**Non-Municipal**	APS ID	**1023950**
Major / Minor	**Minor**	Authorization ID	**1328232**

Applicant and Facility Information

Applicant Name	**Lezzer Martin LP**	Facility Name	**Shannon Mills Estates**
Applicant Address	PO Box 217	Facility Address	Sr 68 & Sr 3029
	Curwensville, PA 16833-0217		Renfrew, PA 16053
Applicant Contact	Jay Lee	Facility Contact	Jay Lee
Applicant Phone	(814) 236-0220	Facility Phone	(814) 236-0220
Client ID	239269	Site ID	646563
Ch 94 Load Status		Municipality	Connoquenessing Township
Connection Status		County	Butler
Date Application Received	September 11, 2020	EPA Waived?	No
Date Application Accepted	September 30, 2020	If No, Reason	DEP Discretion

Purpose of Application: Renewal of an NPDES permit for minor non-municipal sewage facility.

Summary of Review

There are no open violations currently listed in EFACTS for the permittee as of 10/28/2021.

This facility is currently registered to use the eDMR system for reporting.

No changes were proposed to the permit in the renewal application.

Sludge use and disposal description and location(s): Sludge hauled offsite for disposal.

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		Jordan A. Frey, E.I.T. Jordan A. Frey, E.I.T. / Civil Engineer Trainee	November 1, 2021
X		Justin C. Dickey Justin C. Dickey, P.E. / Environmental Engineer Manager	November 1, 2021

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	.019
Latitude	40º 50' 24.00"	Longitude	-80º 0' 11.00"
Quad Name	Evans City	Quad Code	40080G1
Wastewater Description:	Sewage Effluent		
Receiving Waters	Unnamed Tributary to Little Connoquenessing Creek	Stream Code	34989
NHD Com ID	126218436	RMI	
Drainage Area	0.13	Yield (cfs/mi^2)	0.04285
Q_{7-10} Flow (cfs)	0.00557	Q_{7-10} Basis	USGS#03049000 ('77-'11)
Elevation (ft)	1173	Slope (ft/ft)	0.03131
Watershed No.	20-C	Chapter 93 Class.	CWF
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	Final	Name	Little Connoquenessing Creek Watershed

Background/Ambient Data		Data Source
pH (SU)	7.4	Stream Survey on Crab Run
Temperature (°F)	20	Default
Hardness (mg/L)	100	Default
Other: NH_3-N	0.1	Default

Nearest Downstream Public Water Supply Intake		Harmony Borough Water Authority	
PWS Waters	Little Connoquenessing Creek	Flow at Intake (cfs)	2.0
PWS RMI	1.1	Distance from Outfall (mi)	8.2

Changes Since Last Permit Issuance: None.

Other Comments: None.

Treatment Facility Summary				
Treatment Facility Name: Shannon Mills Estates STP				
WQM Permit No.	**Issuance Date**			
1005403	10/14/2005			
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Tertiary	Extended Aeration w/ Chemical Feed and Filtration	Tablet Chlorination/ Dechlorination	0.019115
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.019115			Aerobic digestion	

Changes Since Last Permit Issuance: None.

Other Comments: None.

Compliance History	
Summary of DMRs:	Recurring violations of Total Phosphorus, Ammonia-Nitrogen, and Fecal Coliform
Summary of Inspections:	Last inspection performed 3/13/2018

Other Comments: None

Compliance History

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

Parameter	AUG-21	JUL-21	JUN-21	MAY-21	APR-21	MAR-21	FEB-21	JAN-21	DEC-20	NOV-20	OCT-20	SEP-20
Flow (MGD) Average Monthly	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.002
Flow (MGD) Daily Maximum	0.002	0.002	0.002	0.002	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002
pH (S.U.) Minimum	7.0	6.4	6.1	6.3	6.0	6.4	6.9	6.5	6.5	6.3	6.4	6.6
pH (S.U.) Maximum	7.6	7.7	7.0	7.7	7.2	7.0	7.8	7.4	7.7	7.0	7.6	7.1
DO (mg/L) Minimum	7.3	7.0	6.4	6.5	6.9	6.1	6.9	6.4	7.3	6.9	6.7	6.4
TRC (mg/L) Average Monthly	0.010	0.020	0.001	0.010	0.010	0.020	0.010	0.010	0.010	0.010	0.020	0.010
TRC (mg/L) Instantaneous Maximum	0.050	0.04	0.10	0.010	0.010	0.10	0.01	0.050	0.010	0.010	0.060	0.05
CBOD5 (mg/L) Average Monthly	3.0	3.0	3.0	3.0	3.3	3.7	3.0	3.3	3.0	3.0	3.0	3.0
TSS (mg/L) Average Monthly	4.0	8.5	3.0	3.0	6.5	3.0	3.0	6.0	4.0	8.5	10.0	3.0
Fecal Coliform (CFU/100 ml) Geometric Mean	125	9	1	53	188	307	1	194	1	30	25	1
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	308	18	1	867	366	613	1	387	1	59	50	1
Total Nitrogen (mg/L) Average Monthly	3.8	7.6	38.4	18.2	7.9	5.08	22.6	18.6	9.9	23.6	33.0	32.2
Ammonia (mg/L) Average Monthly	0.8	0.5	1.2	1.4	1.3	1.4	2.1	3.1	2.1	0.80	1.0	0.9
Total Phosphorus (mg/L) Average Monthly	1.5	1.2	3.4	1.3	1.5	0.4	0.2	0.5	0.4	0.30	0.3	1.9
Total Iron (mg/L) Annual Average									0.04			

Compliance History

Effluent Violations for Outfall 001, from: October 1, 2020 To: August 31, 2021

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
Total Phosphorus	06/30/21	Avg Mo	3.4	mg/L	2.0	mg/L

Summary of Inspections: Last inspection performed March 13, 2018.

Other Comments: None.

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** .019
Latitude 40º 50' 23.00" **Longitude** -80º 0' 11.00"
Wastewater Description: Sewage Effluent

Technology-Based Limitations

The following technology-based limitations apply, subject to water quality analysis and BPJ where applicable:

Pollutant	Limit (mg/l)	SBC	Federal Regulation	State Regulation
$CBOD_5$	25	Average Monthly	133.102(a)(4)(i)	92a.47(a)(1)
	40	Average Weekly	133.102(a)(4)(ii)	92a.47(a)(2)
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: None

Water Quality-Based Limitations

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

Parameter	Limit (mg/l)	SBC	Model
Ammonia Nitrogen	1.5	Average Monthly	WQM 7.0 1.0b
Dissolved Oxygen	6.0	Minimum	WQAM6.3 1.2
Total Residual Chlorine	0.036	Average Monthly	TRC Spreadsheet
Total Residual Chlorine	0.11	IMAX	TRC Spreadsheet

Comments: A total phosphorus average monthly/IMAX limit of 2.0/4.0 mg/l is in place for protection of Connoquenessing Creek from eutrophic conditions. The limit applies to the entire basin down to the confluence with Slippery Rock Creek.

Best Professional Judgment (BPJ) Limitations

Comments: Monitoring for total nitrogen is included in the permit renewal in accordance with the Department's SOP entitled "Establishing Effluent Limitations for Individual Sewage Permits."

E. Coli monitoring is a new addition to this permit renewal and will have a monitoring frequency of 1/year.

Total Iron is being monitored due to the Little Connoquenessing Creek Watershed TMDL to determine the existing wasteload from the discharge. Iron is the only parameter of concern in this area of the watershed according to the TMDL.

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	Average Weekly	Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	1/week	Measured
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	3/week	Grab
DO	XXX	XXX	4.0 Inst Min	XXX	XXX	XXX	3/week	Grab
TRC	XXX	XXX	XXX	0.036	XXX	0.11	3/week	Grab
CBOD5	XXX	XXX	XXX	25.0	XXX	50	2/month	8-Hr Composite
TSS	XXX	XXX	XXX	30.0	XXX	60	2/month	8-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/month	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/year	Grab
Total Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	1/month	8-Hr Composite
Ammonia Nov 1 - Apr 30	XXX	XXX	XXX	4.5	XXX	9	2/month	8-Hr Composite
Ammonia May 1 - Oct 31	XXX	XXX	XXX	1.5	XXX	3	2/month	8-Hr Composite
Total Phosphorus	XXX	XXX	XXX	2.0	XXX	4	2/month	8-Hr Composite
Total Iron	XXX	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	8-Hr Composite

Compliance Sampling Location: Outfall 001, after disinfection.

Other Comments: None.

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
20C	34989	Trib 34989 to Ltl Connoquenes'ng Cr	**1.129**	1173.00	0.13	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	0.043	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.40	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
Shannon Mills	PA0239569	0.0191	0.0191	0.0191	0.000	20.00	7.30

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	4.00	8.24	0.00	0.00
NH3-N	25.00	0.10	0.00	0.70

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
20C	34989	Trib 34989 to Ltl Connoquenes'ng Cr	**0.010**	990.00	0.72	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	0.043	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.40	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	25.00	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

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
20C	34989	Trib 34989 to Ltl Connoquenes'ng Cr

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												
1.129	0.01	0.00	0.01	.0295	0.03097	.313	1.91	6.1	0.06	1.165	20.00	7.31
Q1-10 Flow												
1.129	0.00	0.00	0.00	.0295	0.03097	NA	NA	NA	0.06	1.204	20.00	7.31
Q30-10 Flow												
1.129	0.01	0.00	0.01	.0295	0.03097	NA	NA	NA	0.06	1.129	20.00	7.32

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		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
20C	34989	Trib 34989 to Ltl Connoquenes'ng Cr

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
1.129	Shannon Mills	12.02	13.47	12.02	13.47	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
1.129	Shannon Mills	1.6	1.99	1.6	1.99	0	0

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)		
1.13	Shannon Mills	25	25	1.99	1.99	6	6	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
20C	34989	Trib 34989 to Ltl Connoquenes'ng Cr

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
1.129	0.019	20.000	7.314
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
1.910	0.313	6.098	0.059
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
21.34	1.441	1.69	0.700
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.357	27.798	Owens	6
Reach Travel Time (days)			
1.165			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.116	18.04	1.56	7.46
0.233	15.25	1.43	7.74
0.349	12.90	1.32	7.94
0.466	10.90	1.22	8.12
0.582	9.22	1.12	8.24
0.699	7.79	1.03	8.24
0.815	6.59	0.95	8.24
0.932	5.57	0.88	8.24
1.048	4.71	0.81	8.24
1.165	3.98	0.75	8.24

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
20C	34989	Trib 34989 to Ltl Connoquenes'ng Cr

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)
1.129	Shannon Mills	PA0239569	0.019	CBOD5	25		
				NH3-N	1.99	3.98	
				Dissolved Oxygen			6

TRC_CALC

1A	B	C	D	E	F	G
2	**TRC EVALUATION**	- Shannon Mills Estates				
3	Input appropriate values in B4:B8 and E4:E7					
4	0.00557	= Q stream (cfs)		0.5	= CV Daily	
5	0.019115	= Q discharge (MGD)		0.5	= CV Hourly	
6	30	= no. samples		1	= AFC_Partial Mix Factor	
7	0.3	= Chlorine Demand of Stream		1	= CFC_Partial Mix Factor	
8	0	= Chlorine Demand of Discharge		15	= AFC_Criteria Compliance Time (min)	
9	0.5	= BAT/BPJ Value		720	= CFC_Criteria Compliance Time (min)	
	0	= % Factor of Safety (FOS)			=Decay Coefficient (K)	
10	Source	Reference	AFC Calculations		Reference	CFC Calculations
11	TRC	1.3.2.iii	WLA afc = 0.079		1.3.2.iii	WLA cfc = 0.070
12	PENTOXSD TRG	5.1a	LTAMULT afc = 0.373		5.1c	LTAMULT cfc = 0.581
13	PENTOXSD TRG	5.1b	LTA_afc= 0.029		5.1d	LTA_cfc = 0.040
14						
15	Source		Effluent Limit Calculations			
16	PENTOXSD TRG	5.1f	AML MULT = 1.231			
17	PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.036		AFC	
18			INST MAX LIMIT (mg/l) = 0.119			

WLA afc	**(.019/e(-k*AFC_tc)) + [(AFC_Yc*Qs*.019/Qd*e(-k*AFC_tc))...** **...+ Xd + (AFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)**
LTAMULT afc	EXP((0.5*LN(cvh^2+1))-2.326*LN(cvh^2+1)^0.5)
LTA_afc	wla_afc*LTAMULT_afc
WLA_cfc	**(.011/e(-k*CFC_tc) + [(CFC_Yc*Qs*.011/Qd*e(-k*CFC_tc))...** **...+ Xd + (CFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)**
LTAMULT_cfc	EXP((0.5*LN(cvd^2/no_samples+1))-2.326*LN(cvd^2/no_samples+1)^0.5)
LTA_cfc	wla_cfc*LTAMULT_cfc
AML MULT	EXP(2.326*LN((cvd^2/no_samples+1)^0.5)-0.5*LN(cvd^2/no_samples+1))
AVG MON LIMIT	MIN(BAT_BPJ,MIN(LTA_afc,LTA_cfc)*AML_MULT)
INST MAX LIMIT	**1.5*((av_mon_limit/AML_MULT)/LTAMULT_afc)**