Pennsylvania Department of Environmental Protection

Southeast Regional Office
CLEAN WATER PROGRAM

Application Type	**New**	Application No.	**PA0245739**
Wastewater Type	**Sewage**	APS ID	**1126948**
Facility Type	**SRSTP**	Authorization ID	**1508680**

NPDES PERMIT FACT SHEET
INDIVIDUAL SFTF/SRSTP

Applicant, Facility and Project Information

Applicant Name	**SHS 1 LLC**	Facility Name	**555 Reeds Rd SRSTP**
Applicant Address	383 Schuylkill Road	Facility Address	555 Reeds Road
	Phoenixville, PA 19460-1899		Downingtown, PA 19335-1230
Applicant Contact	Stephen Koons	Facility Contact	Stephen Koons
Applicant Phone	(610) 496-0483	Facility Phone	(610) 496-0483
Client ID	389343	Site ID	876430
SIC Code		Municipality	East Brandywine Township
SIC Description		County	Chester
Date Application Received	November 13, 2024	WQM Required	Yes
Date Application Accepted		WQM App. No.	

Project Description: New NPDES permit application for SRSTP.

Summary of Review

The Pa Department of Environmental Protection (PADEP) received a new Part I NPDES and Part II WQM permit applications from HILBEC Engineering & Geosciences, LLC (consultant) on behalf of Stephen Koons (permittee) for permittee's 555 Reeds Rd SRSTP on November 13, 2024. The applications are for a proposed Single Residence Sewage Treatment Facility (SRSTP) located in East Brandywine Township, Chester County with an average design flow of 400 GPD from an existing 3-bedroom Single-Family residence. The proposed discharge is into UNT to East Br. Brandywine Creek through Outfall 001.

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

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	December 16, 2024
X		Pravin Patel Pravin C. Patel, P.E. / Environmental Engineer Manager	12/16/2024

Discharge and Stream Data – 2 - Receiving Waters and PWS

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	001	Design Flow (MGD)	.0004
Latitude	40º 2' 48.84"	Longitude	-75º 44' 9.24"
Quad Name	Downingtown	Quad Code	1840
Wastewater Description:	Sewage Effluent		
Receiving Waters	Unnamed Tributary to East Branch Brandywine Creek (HQ-TSF, MF)	Stream Code	00353
NHD Com ID	26089342	RMI	0.24
Drainage Area	0.36 mi^2	Yield (cfs/mi^2)	0.17
Q_{7-10} Flow (cfs)	0.0611	Q_{7-10} Basis	USGS Streamstats
Elevation (ft)		Slope (ft/ft)	
Watershed No.	3-H	Chapter 93 Class.	HQ-TSF, MF
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	Christina River Basin
Nearest Downstream Public Water Supply Intake	Downingtown Water Authority		
PWS Waters	E. Br. Brandywine Creek	Flow at Intake (cfs)	
PWS RMI	9.34	Distance from Outfall (mi)	4.24

Changes Since Last Permit Issuance: None, new application.

Other Comments: None

Project Narrative:
The Pa Department of Environmental Protection received a new Part I NPDES and Part II WQM permit applications from HILBEC Engineering & Geosciences, LLC (consultant) on behalf of SHS 1 LLC (permittee) for permittee's Single Residence Sewage Treatment Plant (SRSTP), located in 555 Reeds Road, Downingtown, PA 19335 (facility) to serve an existing 3 bedroom single residence. The residence was served by an existing cesspool located within the property boundary and leaking upon the ground surface. The property consists of wetlands, a stream, extremely steep slopes, and poor soils. No other area on the site is suitable for on lot septic per testing conducted by others over several years. The project proposes construction of a packaged treatment plant to serve the single residence. The system is designed to serve 1 EDU or 400 GPD. The details of the proposed treatment will be discussed in the Internal Review & Recommendation (IR&R) that'll accompany the WQM permit. In short, the packaged treatment plant will be a Orenco Advantex AX20N with UV disinfection.

The proposed treatment package is listed in the PADEP's approved On-lot Alternate Technology Listings which qualifies it for coverage under general PAG04 permit for SRSTP. However, the receiving stream, an UNT to East Branch Brandywine Creek, is designated as High-Quality Trout Stocking and Migratory Fish (HQ-TSF, MF). A general permit can't be issued for special protection watersheds, like HQ or Exceptional Value (EV) waters. Therefore, this permit is considered as an Individual Permit and will be reviewed accordingly.

One of the conditions to approve a sewage discharge into an SP watershed is to conduct Anti-Degradation analysis. The proposed treatment must demonstrate that the treated effluent will have non-degrading effects on the receiving stream. Other non-discharge alternatives must be considered during the planning phase as well. Since Act 537 Planning was approved for this project under DEP Code 1-15915-284-3s (dated October 11, 2024), it is assumed that no other non-discharge alternatives were suitable for this project (Per SOP BCW-PMT-003). A full-blown Anti-Degradation Analysis

wasn't conducted for this SRSTP discharge, however, the **Technology-Based Effluent Limits (TBELs) from Anti-Degradation Best Available Combination of Technology (ABACT)** were considered. The following ABACT limits are recommended based on DEP's "Water Quality Antidegradation Implementation Guidance" (Doc. No. 391-0300-002, November 29, 2003):

Parameter	Treatment Process Performance Expectations (mg/L)		
	<2,000 gpd	2,000-50,000 gpd	>50,000 gpd
$CBOD_5$ (May 1 – Oct. 31)	**10**	10	10
$CBOD_5$ (Nov. 1 – Apr. 30)	**20**	20	10
Suspended Solids	**20**	10	10
NH_3-N (May 1 – Oct. 31)	**5.0**	3.0	1.5
NH_3-N (Nov. 1 – Apr. 30)	**15.0**	9.0	4.5
Effective disinfection	Disinfection should be accomplished using a method that leaves no detectable residual. Disinfection using ultra-violet light or other non-chlorine based systems is encouraged and must be considered.		
Other parameters, as needed	*Determined by the size and characteristics of the proposed discharge, may include – NO_2/NO_3-N, Total Phosphorus, Copper, Lead, Zinc*		

The following effluent limitations and monitoring requirements, at a minimum, will be established in all new and renewed SFTF permits based on the requirements of DEP's "Standard Operating Procedure (SOP) for Clean Water Program New and Reissuance Small Flow Treatment Facility Individual NPDES Permit Application" (SOP No. BCW-PMT-003, Version 1.8, Final, November 9, 2012, Revised November 9, 2023).

Parameter	**Avg**	**IMAX**	**Sample Type**	**Frequency: SFTFs**	**Frequency: SRSTPs**
Flow (GPD)	Report	XXX	Estimate (SRSTPs) Measured (SFTFs)	1/month	1/year
CBOD5 (mg/L)	10	20	Grab	1/month	1/year
TSS (mg/L)	10	20	Grab	1/month	1/year
TRC (mg/L) *	Report for SRSTPs; Use TRC Spreadsheet to determine WQBELs or 0.02 mg/L for SFTFs		Grab	1/month	1/year
Fecal Coliform (No./100 ml)	200 Geometric Mean (SFTFs) / Average (SRSTPs)		Grab	1/month	1/year

* This is a new SRSTP with UV disinfection. The facility will not be required to measure TRC nor will be required to report UV dosage/intensity/transmittance.

The receiving stream, UNT to E. Branch Brandywine Creek, is in Christina River TMDL. This facility doesn't have a WLA in the TMDL since it's a new application. There are few SRSTPs with WLA in East Branch Brandywine sub-basin in the TMDL. To be consistent with other similar facilities, the following WLA is proposed for this facility:

NPDES	**FACILITY NAME**	**FLOW mg/l**	**$CBOD_5$ mg/l**	**NH_3-N mg/l**	**TN mg/l**	**TP mg/l**	**DO mg/l**	**$CBOD_5$ lb/day**	**NH_3-N lb/day**	**TN lb/day**	**TP lb/day**	**DO lb/day**
PA0245739	555 Reeds Rd SRSTP	0.0004	25	30	40	10	6	0.083	0.1	0.133	0.033	0.02

These WLAs will be adjusted in the TMDL Spreadsheet to keep a tract of WLS re-distribution within sub-watershed so that the total WLA for the whole watershed isn't exceeded. The Department, in collaboration with EPA, maintains a spreadsheet to keep track of all readjustments for future TMDL revisions.

Development of final effluent limits:

Effluent limitations are derived from ABACT in the Antidegradation Implementation Guidance, from SFTF SOP BCW-PMT-003, and from Christina River TMDL for W. Br. Brandywine Creek; for each parameter, and the most stringent limit was selected as the limitation. Water Quality Modeling isn't performed for SRSTPs, per SOP BCW-PMT-003 (revised Nov 9, 2023.)

UV:
The SOP indicates that it is not necessary to require UV intensity or transmittance monitoring in the permit for SRSTPs/SFTFs. This is also consistent with Antidegradation ABACT requirements for effective disinfection.

The performance sheet provided with the application package indicates that the facility should be able to meet all numeric limits proposed in this permit, if it is constructed as designed.

TEST CENTERS

AdvanTex Effluent Averages	$CBOD_5$ (mg/L)	TSS (mg/L)	FC[a] (mpn/100ml)	FC/UV[b] (mpn/100ml)	Duration
NSF/ANSI Standard 40 Testing	5	4	-	-	6 months
NSF/ANSI Standard 40 Testing with UV Disinfection	4	6	$1.35x10^4$	1.7	7 months
Rotorua District Council Approval Testing	2	3	$1.2x10^4$	-	9 months
New Zealand OSET Testing Programme	3	4	-	-	10 months

FIELD TESTING

AdvanTex Effluent Averages (# of SFRs)[c]	$CBOD_5$ (mg/L)	TSS (mg/L)	FC[a] (units vary)	FC/UV[b]	Duration
Roger Shafer, P.E., "Testing in Fractured Bedrock" (1)	5	6	$4.5x10^3$	-	8 months
Virginia Approval Testing Program (18)	7	9	$7.8x10^2$	-	18 months
Pennsylvania Testing Program (11)	6	10	$9.5x10^2$	-	1-3 years
Skaneateles Demonstration Project (2)	4	3	$3.5x10^2$	-	2 years
La Pine National Demonstration Project (3)	9	6	$9.9x10^3$	-	2 years, 7 months
Green Hill Pond Watershed Demonstration Project (5)	8	5	$1.9x10^3$	-	1 year, 4 months
North Carolina Approval Testing Program- (>50)[d]	7	6	-	-	4 years
Maryland Best Available Technology Field Testing Program (12)[e]	5	4	-	-	1 year

[a] *FC sample taken following AdvanTex treatment. Fecal Coliform figured as a geometric mean*
[b] *FC/UV = FC samples taken following ultraviolet disinfection unit*
[c] *SFR = Single-family residences*
[d] *Includes single-family residences and vacation rentals*
[e] *Unit tested was an AdvanTex® AX20-RT Treatment System*

TEST CENTERS SUMMARY

AdvanTex Effluent Averages	Total N (mg/L)[a]	NH_3 (mg/L)	Total P (mg/L)	Duration
NSF/ANSI Standard 40 Testing	12 (64%)[b]	0.9 (96%)	-	7 months
NSF/ANSI Standard 40 Testing with UV Disinfection	13 (66%)	1.1	-	6 months
Rotorua District Council Approval Testing	13 (82%)	0.2 (99%)	8 (33%)	13 months
New Zealand OSET Testing Programme	12 (80%)	0.6 (99%)	-	10 months

FIELD TESTING SUMMARY

AdvanTex Effluent Averages (# of SFRs)[c]	Total N (mg/L)	NH_3 (mg/L)	Total P (mg/L)	Duration
Roger Shafer, P.E., "Testing in Fractured Bedrock" (1)	14 (63%)	-	6 (33%)	8 months
NSF Pennsylvania Testing Program (11)	17 (68%)	1.7 (96%)	-	1-3 years
Virginia Approval Testing Program (13)	15	1.8	-	18 months
Jefferson County Health Dept. Permit Testing (43)	15	-	-	2 years, 7 months
Skaneateles Demonstration Project (2)	14	0.9	10	2 years, 2 months
La Pine National Demonstration Project (3)	17 (74%)	1.9	9 (18%)	2 years, 7 months
Rhode Island Demonstration Project (5)	18	-	9	1 year, 4 months
North Carolina Approval Testing Program— Mode 1 (14)[d]	26 (63%)	-	-	2 years, 10 months
North Carolina Approval Testing Program — Mode 3 (1)	15	-	-	2 years, 10 months
Maryland Best Available Technology Field Verification (12)[e]	18 (68%)	-	-	1 year
Maryland Best Available Technology Field Verification (12)[f]	15 (82%)	1.4	-	1 year

[a] TN = TKN + NO_3-N + NO_2-N
[b] Percent Reduction
[c] SFR = Single-family residences
[d] Includes single-family residences and vacation rentals
[e] AdvanTex AX20
[f] AdvanTex AX20-RT

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	Annual Average	Maximum	Instant. Maximum		
Flow (MGD)	0.0004 Annl Avg	XXX	XXX	XXX	XXX	XXX	1/year	Estimate
Dissolved Oxygen	XXX	XXX	6.0 Inst Min	XXX	XXX	XXX	1/year	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	XXX	XXX	XXX	10.0	XXX	20.0	1/year	Grab
Total Suspended Solids	XXX	XXX	XXX	10.0	XXX	20.0	1/year	Grab
Fecal Coliform (No./100 ml)	XXX	XXX	XXX	200	XXX	XXX	1/year	Grab
Total Nitrogen	XXX	XXX	XXX	40.0	XXX	XXX	1/year	Grab
Ammonia-Nitrogen	XXX	XXX	XXX	5.0	XXX	10.0	1/year	Grab
Total Phosphorus	XXX	XXX	XXX	10.0	XXX	XXX	1/year	Grab

Compliance Sampling Location: At Outfall 001

Other Comments: None