PRELIMINARY ENGINEERING REPORT

HARLEYVILLE WASTEWATER TREATMENT PLANT UPGRADE SRF No. 801-01

APRIL 2023

SOUTH CAROLINA
ARDURRA GROUP INC.
No. 6082
CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA
PROFESSIONAL ENGINEER
No. 32097
DANIEL J. HUGGINS, JR.

4/10/2023

Project # 100467.05

March 2023

ARDURRA

A Report Prepared for:

Honorable Charles Ackerman Mayor
Town of Harleyville
122 W. Main Street
PO Box 35
Harleyville, SC 29448t
Phone: 843-462-7676

HARLEYVILLE WASTEWATER TREATMENT PLANT UPGRADE
PRELIMINARY ENGINEERING REPORT

TOWN OF HARLEVILLE, SC

Prepared by:

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Ardurra Project No: 100467.05

ARDURRA

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1 GENERAL INFORMATION

1.1 Project Sponsor

Town of Harleyville
122 W. Main Street
PO Box 35
Town of Harleyville, SC 29448
Phone: 843-462-7676
Sponsor Contact: Honorable Charles Ackerman Mayor

1.2 Engineering Design Firm

Ardurra, Inc
4000 Faber Place Drive, Suite 330
North Charleston, SC 29405
Phone: 843-628-3352
Engineer in responsible charge: Dan Huggins

1.3 Description of Service Area

The Town of Harleyville is a community of less than 1,000 people. It is located in Dorchester County, in the Charleston region of South Carolina, which is one of the fastest-growing areas in the state. Growth is expected to occur, especially in portions of Harleyville that are near interstate 26. The largest industries in Harleyville, SC are manufacturing, educational and health care services, transportation, warehousing and utilities. Land use within the Town is primarily agricultural and residential. Commercial and additional institutional land uses are concentrated along several major roads in the Town.

The Town's overall population growth is at a rate slower than the County's rate, and has fluctuated considerably throughout the 20th and 21st centuries. It expanded to an estimated high of 961 residents in 2011, and shrank to an estimated low of 624 residents in 2016. The last official US Census in 2020 recorded the population at 666. Population projections were calculated by the BCDCOG at 5-year intervals going forward through 2040 assuming the trend in the Town's growth rate would continue as seen in ESRI's projections from 2020 to 2025 (a 2.5% population increase per 5-year period). At this continued rate of increase, the Town expects to have a population of approximately 715 residents by 2030, 733 residents by 2035, and 752 residents by 2040.

The Town is located within the Saluda-Edisto watershed, which is part of the Edisto River Basin in the Middle Atlantic Coastal Plain of South Carolina. The Edisto River Basin is subdivided into 13 watersheds, flowing from the Sandhills region to the Upper and Lower Coastal Plain and Coastal Zone regions. There are three sub-watersheds within the Town of Harleyville's limits, including the Lower Indian Field Swamp, Dam Branch-Four Hole Swamp and Walnut Branch. The Spring Branch-Four Hole Swamp watershed lies just outside of Town limits to the northwest. Other major hydrologic features of the area include the headwater reaches of the Tom and Kate Branch of the Edisto River, which originate in the northern end of town, generally flowing west then southward. The Little Walnut Branch of the Edisto River also originates in the northern end of town and flows generally southeast. Hence, the wetlands surrounding much of the Town are predominantly freshwater forest or shrub.

1.4 Customers to be Served

The Town of Harleyville's wastewater collection and treatment system is a local system that serves mostly residential and commercial users located in the Town. The Town maintains a sewer system throughout the town. The plant is located at the west end of Range Road, about 500 ft east of the Tom and Kate branch. Outside of the Town, water and sewer services are provided by Dorchester County.

Harleyville's sewer collection and treatment system currently provides service to 303 customers, consisting of 268 residential and 35 commercial users. Because the Town's population is projected to increase from 681 in 2020 to 752 in 2040, more users would be served by the Town's sewer collection and treatment system.

2 DISCUSSION OF NEEDS

The Harleyville WWTP was last upgraded in 2003, constructing a treatment system to replace the previous Rotating Biological Contactor (RBC) based treatment system. The facilities associated with the former RBC plant had been abandoned in place.

2.1 Treatment Capacity

The existing treatment system has a design capacity of 0.15 million gallons per day (mgd) of average daily flow. The treatment process consists of bar screening, flow equalization, aeration/nitrification, denitrification, and settling with a clarifier. Sludge is periodically wasted from the secondary clarifier by means of an airlift pump to a sludge thickening tank. The thickened sludge is sent to a sludge drying bed prior to being periodically removed for offsite disposal. The supernatant is transferred from the thickening tank back to the anoxic tank. **Table 1** below lists the design parameters for the existing system.

Table 1. Design Parameters

Design Parameter	Influent	Effluent
Average Daily Flow (mgd)	0.15	
BOD_5 (mg/L)	210	10
TSS (mg/L)	284	10
NH4-N (mg/L)	25	1
TKN (mg/L)		10
pH		7

The plant has been well operated, producing an effluent that has been meeting the requirements set forth in the current NPDES permit (SC0038504) most of the time except during the period when the influent flow considerably exceeded the design flow of 0.15 MGD. As indicated in the recent Discharge Monitoring Reports (DMRs), the influent flow has frequently approached or exceeded 80% of the design/permitted flow of 0.15 MGD, i.e., 0.12 MGD. Therefore, considering the increase of the wastewater flow to be conveyed to and treated at the WWTP, the current treatment capacity of 0.15 MGD is insufficient and needs to be increased. A request was made to the SCDHEC in June 2021 for a new wasteload allocation. The SCDHEC reviewed and approved the request. As indicated in **Appendix A**, the Town obtained the new wasteload allocation for the WWTP based upon the anticipated increased flow of 0.225 mgd. **Table 2** lists the key effluent limitations that are currently being required, as well as the anticipated future limitations.

Table 2. Key Effluent Limits

Parameter	Current Effluent Limit	Anticipated Future Effluent Limit	Limit Type
Flow Basis (mgd)	0.15	0.225	Design flow
BOD_5 (mg/L)	15	9.27	monthly average
TSS (mg/L)	30	30	monthly average
NH4-N (Mar-Oct) (mg/L)	2.05	2.08	monthly average
NH4-N (Nov-Feb) (mg/L)	2.1	N/A	monthly average
Total Phosphorus (mg/L)	MR	MR	once/quarter
Total Nitrogen (mg/L)	MR	MR	once/quarter
UOD (lbs/day)	26.95	26.95	monthly and weekly average
pH	6.0-8.5	6.0-8.5	Weekdays

2.2 Other Improvement Needs

Although the Town has completed various updates in recent years to improve efficiencies and ensure adequate conveyance capacity to meet the town's needs, limited repairs have been performed for the Harleyville WWTP. No major upgrade has been completed since 2003. As shown in **Figure 1**, several structures and equipment exhibit either severe corrosion or structural defects, indicating that several components of the existing plant are in poor to fail condition, requiring a repair or replacement. A facility upgrade is necessary to ensure protection of the water quality for the Kate & Tom branch that flows into the Edisto River via the Indian Field Swamp.

Following an onsite assessment of the plant conditions and an interview with the plant operator, the following improvement needs have been identified:

- Demolish the existing storage shed that exhibits severe corrosion and shows structural defects.
- Demolish the entire former RBC plant that had been abandoned in 2003.
- Demolish the existing sludge drying bed that is not performing to standards.
- Replace the existing influent screen with a new influent screen that can treat an increased peak hourly flow of 1.1 mgd.
- Install a flow splitter downstream of the proposed new influent screen that splits the flow to the existing 0.15 mgd treatment system and the proposed new 0.075 mgd treatment system.
- Install a new 0.075 mgd Purestream package wastewater treatment system with a process design similar to the existing 0.15 mgd system.

- Replace the existing UV system with a new dual-unit open channel UV that is capable of treating the peak hourly flow of 1.1 mgd. With one unit offline, the other unit is capable of treating 0.55 mgd of flow, which is approximately 80% of the anticipated future peak hourly flow of 0.675 mgd.
- Install a SCADA system with alarming and warning functions.
- Replace fence, pipes, blowers, and mixers as needed.
- Construct a road inside the plant.

Appendix D shows the above-proposed improvements. All proposed improvements will be within the fence of the existing plant.

1

2

3

4

5

1. Storage Shed
2. Former RBC Treatment Facilities (abandoned in place)
3. Former RBC Treatment Facilities (abandoned in place)
4. Sludge Drying Beds
5. Influent Pipes

Figure 1. Existing Facilities at the Plant Site

3 ALTERNATIVES CONSIDERED

3.1 Alternative #1 No Action

The “No Action” alternative would not take any action to improve the wastewater treatment plant. The facilities would continue to operate and be maintained in the current condition. This action will result in potentially more frequent permit violations due to the expected increase in influent pollutants and hydraulic loads that would exceed the treatment capacity of the existing plant. Consequently, this will bring negative impacts to all Harleyville customers, and deteriorate the surface water quality of the Edisto River watershed.

3.2 Alternative #2 Regionalization

The nearby wastewater treatment plant is the Upper Dorchester WWTP, located in St George, SC. The Upper Dorchester WWTP is owned and operated by Dorchester County, with a permitted flow of 0.8 mgd. In recent years, the Upper Dorchester WWTP has been receiving an influent flow that has frequently exceeded 0.8 mgd. Therefore, diverting the 0.225 mgd wastewater flow from Harleyville to Upper Dorchester WWTP would require an expansion of the existing Upper Dorchester WWTP.

In addition, the existing sewer collection system operated by Dorchester County would need to be upgraded to convey the wastewater from Harleyville to Upper Dorchester WWTP. Although the Dorchester County recently received $4.2M in federal funds in March 2022, to design and construct *The Greater St. George Wastewater Project* for the purpose of expanding its sewer system in this area, it would take multiple years before the infrastructure is ready to receive wastewater from Harleyville.

Finally, the Town intends to maintain its own sewer and treatment facilities without losing control. For these reasons, the option of consolidating the existing Harleyville WWTP into a regional wastewater plant was less favored.

3.3 Alternative #3 Expansion of WWTP

The existing treatment plant is a packaged system manufactured by Purestream (Model #: PETC-150). Despite that the system was installed nearly 20 years ago and would require repairs, the entire system is structurally solids and is capable of treating the wastewater and producing an effluent that reliably meets the permit limitations. Thus, adding a new 0.075

system to the existing site, which will also be designed and supplied by Purestream, will bring the total treatment capacity up to 0.225 mgd.

4 COST AND EFFECTIVENESS ANALYSIS OF ALTERNATIVES

Table 3 provides a summary of estimated costs for all three (3) above-described alternatives that have been considered for this project. Based upon the Clean Water SRF requirement, the O&M costs were estimated for 20 years and converted to the present worth.

Table 3. Summary of Alternatives

	Alternative	Capital Cost	O&M Cost/YR	Salvage Value	NPV
1	No Action	$ -	$ 12,039	$ 150,000	$ 90,779
2	Regionalization (Connect to Upper Dorchester WWTP)	$ 6,979,000	$ 60,000	$ 3,489,500	$ 4,689,500
3	Plant expansion by adding a 0.075 mgd treatment train	$ 2,478,264	$ 18,058	$ 2,828,000	$ 11,424

The Cost and Effectiveness Certification Form, DHEC 3152 is attached in **Appendix A**.

5 RATIONALE FOR THE SELECTED ALTERNATIVE

Alternative #1 is ruled out because taking “No Action” would result in more frequent permit violations, which would cause degradation of the water quality.

Alternative #2 “regionalization” would meet the needs of adequately treating the increased wastewater, but at a much higher capital and O&M costs that would include expansion of the existing Upper Dorchester WWTP, installation of new force mains and pump stations to convey the wastewater from Harleyville to St. George. In addition, the Town intends to maintain its control of the Town’s own sewer and treatment facilities. Therefore, this alternative is eliminated.

Alternative #3 “expanding the capacity of the existing treatment plant” is expected to achieve the purpose of adequately treating the increased wastewater, and thus enhance the quality of surface water in the Edisto River watershed. The estimated capital cost for this alternative is also lower than the cost for Alternative #2.

Therefore, the most cost-effective approach for expanding the treatment capacity is to keep the existing 0.15 mgd equipment and add a new 0.075 mgd treatment train, along with other improvements, to increase the total treatment capacity to 0.225 mgd. In addition, this approach will allow uninterrupted plant operation during the installation of the new system without having to bypassing the flows, which minimizes the risks of polluting the nearby environment during the construction.

6 COST ESTIMATION FOR THE SELECTED ALTERNATIVE

Table 4 below is an estimation of the capital costs for upgrading the Harleyville WWTP according to the above-described alternative #3. In addition, the estimated annual operation and maintenance costs, including chemical, electricity, sludge hauling and disposal, and parts replacement, are estimated to be approximately $18,000.

Table 4. Alternative #3 Capital Costs Estimation for Alternative #3

Cost Item	Amount	SRF Funded	SCIIP Funded
Planning and Design	$157,000	$72,000	$85,000
Land	N/A	N/A	N/A
Legal and Appraisal	N/A	N/A	N/A
Construction	$1,787,250	$883,000	$904,250
Contingency for Construction	$444,514	N/A	$444,514
Equipment	N/A	N/A	N/A
Materials	N/A	N/A	N/A
Contingency for Materials	N/A	N/A	N/A
Construction Engineering	$90,000	$45,000	$45,000
Loan Closing Fee	N/A	N/A	N/A
Total	$2,478,264	$1,000,000	$1,478,764

7 DESIGN PARAMETERS AND CALCULATIONS FOR THE SELECTED ALTERNATIVE

Ardurra requested plant discharge monitoring data spanning the period January 2018 to October 2022 for the purposes of this evaluation. This data was reviewed to identify the data gaps for this report and analyzed to assess the treatment performance under current operation mode. Additional influent samples were collected and analyzed for ammonia-nitrogen and total Kjeldahl-nitrogen (TKN). **Table 5** summarizes the design parameters for the upgraded treatment plant.

Table 5. Process Design Parameters

Parameter	Anticipated Future Influent Characteristics	Anticipated Future Effluent Limit	Limit Type
Flow (mgd)	0.15	0.225	Average Daily flow
Flow (mgd)	0.387		Peak Daily Flow
	0.675		Peak Hourly Flow
BOD5 (mg/L)	200	9.27	monthly average
TSS (mg/L)	200	30	monthly average
NH4-N (mg/L)	30		-
TKN (mg/L)	35		-
NH4-N (Mar-Oct) (mg/L)		2.08	monthly average
NH4-N (Nov-Feb) (mg/L)		N/A	monthly average
Total Phosphorus (mg/L)		MR	once/quarter
Total Nitrogen (mg/L)		MR	once/quarter
UOD (lbs/day)		26.95	monthly and weekly average
pH	6.9	6.0-8.5	Weekdays

The existing plant consists of the following components:

1) A Purestream/Ecofluid USBF packaged wastewater treatment plant with the design average daily flow of 0.15 mgd. The package system consists of a coarse bar screen, a flow equalization tank, an activated sludge system including an anoxic zone, an aerobic zone, and a secondary clarifier, and a sludge storage tank.
2) A Trojan UV 3200K PTP system consisting of four (4) UVM 2-64 modules and a total of eight (8) UV lamps. The design peak flow is 0.5 mgd.

Based upon Alternative #3, the additional equipment to be designed and installed at the plant will consist of the following major process components:

1) A Purestream/Ecofluid USBF packaged wastewater treatment plant with the design average daily flow of 0.075 mgd. The package system consists of a coarse bar screen, a flow equalization tank, an activated sludge system including an anoxic zone, an aerobic zone, and a secondary clarifier, and a sludge storage tank.
2) A Trojan UV 3000K PTP system consisting of four (4) UVM 2-64 modules and a total of eight (8) UV lamps, split into two units. The design peak flow is 1.1 mgd. With the largest flow capacity unit out of service, the remaining unit shall have a design flow capacity of 0.55 mgd, exceeding seventy-five (75) percent of the peak hourly design flow of 0.675 mgd.
3) A new flow splitting box that splits the flow to the existing 0.15 mgd system and the new 0.075 mgd system.
4) A new ¼ inch static screen that will be installed upstream of the flow splitting box. The hydraulic capacity of this screen would be 1.1 mgd, eq. 750 gpm.

Table 5 summarizes the system design parameters provided by the equipment supplier. The design and operational parameters were reviewed and verified as part of the preparation of this PER.

Table 5. Town of Harleyville WWTP Major Components and Design Capacities

Process	Component	Proposed New Facility		Existing Facility	
		# of Units	Description	# of Units	Description
Influent Flow Splitting	Flow Splitting Box	1	One (1) concrete box, located upstream of the treatment units to split the influent flow	0	Not Applicable
Preliminary Treatment	Manual Bar Screen	1	0.1 inch cylindrical bar screen with flanged inlet and outlet, 860 gpm (1.2 mgd) peak flow capacity	1	¼ inch cylindrical bar screen, 400 gpm (0.575 mgd) peak flow capacity
	Equalization or Surge Tank	1	17'L x 14'W x 12.5'D, providing a retention time of 14.5 hr at the design ADF. Equipped with coarse bubble diffusers	1	34'L x 14'W x 12.5'D, providing a retention time of 14.5 hr at the design ADF. Equipped with coarse bubble diffusers
	Surge Pump	1	50 GPM at 15 ft TDH	2	90 GPM at 15 ft TDH
	Flow Control Chamber	0	Not Applicable, will connect to exsiting flow control chamber	1	A flow control chamber is mounted on wall separating the EQ tank and the sludge tank
Activated Sludge System	Anoxic Zone	1	17'L x 14'W x 12.5'D, equipmed with submersible mixers	2	17'L x 14'W x 12.5'D each, equiped with submersible mixers
	Aerobic Zone	1	17'L x 38'W x 12.5'D, MLSS to be 2000 - 5000 mg/L, equiped with fine bubble diffusers	2	17'L x 38'W x 12.5'D each, MLSS is 2000 - 5000 mg/L, equiped with fine bubble diffuers
	RAS/WAS Pump	1	4" airlift draws sludge to either the anoxic zone or the sludge storage tank. Mixed liquor recycle ratio is 1-3.5; WAS is determined to maintain an SRT of 8-20 days.	2	4" airlift draws sludge to either the anoxic zone or the sludge storage tank. Mixed liquor recycle ratio is 1-3.5; WAS is determined to maintain an SRT of 8-20 days.
	Secondary Clarifiers	1	12 ft diameter x 10 ft depth	2	12 ft diameter x 10 ft depth
Post Aeration	Post Aeration Tank	1	20'L x 3'W x 12.5'D, equiped with fine bubble diffusers	1	20'L x 3'W x 12.5'D, equiped with fine bubble diffusers
Disinfection	UV Disinfection	1	Add a Trojan UV 3200K PTP or equivalent with 1.1 mgd peak flow capacity to the existing UV that will be relocated	1	Glasco UV 3200K PTP with 4 modules and 8 lamps, 0.5 mgd peak flow capacity (to be relocated)
Effluent Flow Measuremnt	Flume	1	One (1) v-notch weir box with an ultrasonic level sensor	1	One (1) v-notch weir box with an ultrasonic level sensor (weir to be demolished, level sensor to be relocated)
Sludge Handling and Processing	Sludge Storage Tank	1	17'L x 5'W x 12.5'D, equiped with coare bubble diffusers	1	34'L x 5'W x 12.5'D, equiped with coarse bubble diffusers
	Blowers	1 set	(2) 1.9 H.P., (2) 7.5 H.P., and (1) 2 H.P. blowers, supplying air to equalization, aeration, post aeration, and sludge holding tanks, as well as the airlift systems	1 set	(3) 5 H.P., (3) 7.5 H.P., and (1) 1.5 H.P. blowers, supplying air to equalization, aeration, post aeration, and sludge holding tanks, as well as the airlift systems

8 LOCATION MAP

The plant is located at the west end of Range Road, about 500 ft east of Tom and Kate branch. **Figure 2** depicts the location of the WWTP and the plant's service area. with a preliminary schematic of the expanded facilities and proposed new pipes to be installed.

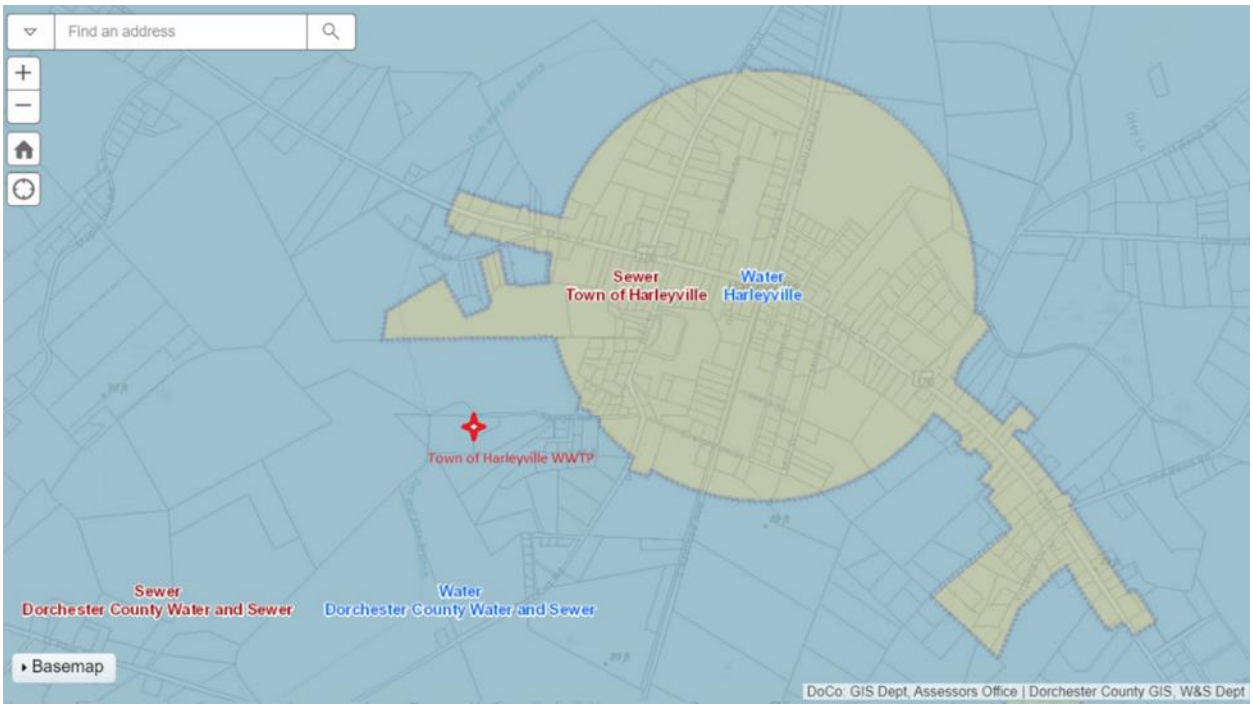


Figure 2. Town of Harleyville Sewer Service Area and Harleyville WWTP Location Map

9 PLANNING AREA MAP

The area planned to be served by the upgraded Harleyville WWTP remains the same, as shown in **Figure 2**.

10 ANY OTHER APPLICABLE INFORMATION REQUIRED BY SECTION R.61-67.200, STANDARDS FOR WASTEWATER FACILITIES CONSTRUCTION

R.61-67.200 has been reviewed and the relevant standards have been incorporated into the preliminary design presented in this report.

11 ENVIRONMENTAL EVALUATION

The environmental evaluation will be added to this report once DHEC completes an assessment of the environmental constraints.

12 PUBLIC PARTICIPATION

A public meeting/hearing will be held during the environmental evaluation being performed by DHEC.

APPENDIX A
Wasteload Allocation

Healthy People. Healthy Communities.

BUREAU OF WATER

October 28, 2021

Dan Huggins, Project Manager
Ardurra
4000 Faber Place Dr
North Charleston, SC 29405

RE: Town of Harleyville WWTP – New Wasteload Allocation
NPDES Permit No. SC0038504
Dorchester County

Dear Mr. Dan Huggins,

At your request, a wasteload allocation has been obtained for Harleyville WWTP at the proposed flow of 0.225 MGD to Tom and Kate Branch into Indian Field Swamp into the Edisto River. This wasteload allocation will replace or supersede all previous wasteload information provided based on new information presented by the Water Quality Modeling Section.

Based on the wasteload allocation, the NPDES limits can be expected to be as follows (these are generally monthly average values unless noted, additional limits with weekly average and daily maximum concentrations may also be included):

Million Gallons per day of Effluent Flow:	0.225 MGD					
Parameters	Mass limits (lbs./day)			Concentration Limits (mg/L)		
	Monthly Average	Weekly Average	Daily Maximum	Monthly Average	Weekly Average	Daily Maximum
BOD_5	17.40	26.10	---	9.27	13.91	---
TSS	56.30	84.44	---	30	45	---
NH_3-N (Mar-Oct)	3.90	5.85	---	2.08	3.12	---
TRC	0.021	---	0.036	0.011	---	0.019
Dissolved Oxygen	---	---	---	---	---	6.0 min at all times
pH	---	---	---	6.0 – 8.5	---	---
E. Coli/100mL	---	---	---	126/100 ml	---	349/100 ml
UOD	26.95	---	---	---	---	---
Total Phosphorous	MR	MR	---	MR	MR	
Total Nitrogen	MR	MR	---	MR	MR	----

The following conditions should be noted. The wasteload is informational/speculative only until the following actions occur:

1. A determination whether the project is consistent with the applicable 208 Water Quality Plan must be made on the proposed expansion during the NPDES permit process.

2. In situations where a permittee proposes a new or expanded discharge into surface waters whose quality is greater than water quality standards (i.e., higher quality waters), an alternatives analysis shall be included in the engineering report. The report should also show that the proposal is necessary to important social and economic development in the area of the receiving waters such that the discharge should be allowed under the anti-degradation provisions of Regulation 61-68 (Water Quality Standards). The alternatives analysis shall demonstrate that none of the following applicable alternatives are economically and technologically reasonable:

    a. Reuse that would minimize or eliminate the need to lower water quality;
    b. Use of other discharge locations;
    c. Connection to other wastewater treatment facilities;
    d. Use of land application;
    e. Product or raw material substitution; and
    f. Any other treatment option or alternative, which would minimize or eliminate the need to lower water quality.

3. An NPDES permit application and preliminary engineering report is provided on the proposed expansion. Please note that the NPDES permitting action must be completed in accordance with Regulation 61-9, and no appeals filed, before a Construction Permit could be considered for this project. The Permittee may request coverage under the NPDES General permit for Domestic Wastewater Treatment Plants.

4. Additional metals testing and/or requirements may be necessary subject to information provided with the NPDES application and/or PER. Submission of available effluent metals data may result in specific pollutants to be added or deleted from the limits. Additional analysis of the pollutants listed on the cover page would be helpful in this assessment.

5. Please not that the applicant must comply with the provisions of R.61-9.600 (Viability Requirements) that address entities owning wastewater systems have the technical, managerial, and financial means to comply with the regulations as a prerequisite for receiving a wastewater discharge permit (NPDES). As part of the NPES process, the permittee may be required to provide additional information (as described in R.61-9.600) to document compliance with this condition. Please refer to R.61-9.600, to determine if additional information is needed.

If you have any questions or comments, please contact me at 803-898-1904 or foulkstn@dhec.sc.gov.

Sincerely,

Tyra N. Foulks
Domestic Wastewater Permitting Section
Water Facilities Permitting Division

Attachments: Wasteload Allocation

cc: Charles Ackerman, Mayor, P.O Box 35 122 West Main St, Harleyville, Sc 29448
Shawn Clarke, PE, Director, Water Facilities Permitting Division
Brenda A. Green, Manager, Water Quality Modeling Permitting Section
Wade Cantrell, Manager, 303(d), WQ Modeling & TMDL Section
Feleke Arega, Water Quality Modeling Section

ARDURRA

June 15, 2021

SCDHEC

RE: Town of Harleyville Wasteload Allocation Request

To Whom it May Concern:

On behalf of the Town of Harleyville, we are requesting a wasteload allocation for a discharge of 225,000 gallons per day to Tom and Kate Branch.

Sincerely,
ARDURRA

Daniel J. Huggins, Jr., P.E.
Senior Project Manager

4000 Faber Place Drive
Suite 330
Charleston, SC 29405

843-628-3352

www.tcgeng.com

S.C. DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL
BUREAU OF WATER
DIVISION OF WATER QUALITY
303(d), MODELING, AND TMDL SECTION

Date: 07/07/2021 Engineer: WLA Type: Request
Discharger: Town of Harleyville NPDES: SC0038504
County: Dorchester WMU: 0203 HUC: 03050206-02-04
Receiving waters: Tom and Kate Branch

I. Water Quality Modeling Section

A. Model Data:

Model used: QUAL2E

Name: tomkate.in

USGS station / site:02174150

Unit 7Q10 (cfs/mi^2): 0.0

Stream critical flow (cfs): 0.00 Critical flow type: 7Q10

Avg. annual flow (cfs): 1.16

Drainage area (mi^2):1.21

Stream Q: waste Q ratio: 0:0.225

Temp critical (F/C): 78.8 / 26

Temp seasonal (F/C): 57.2 / 14

Velocity (ft/s): 0.1264-0.1620

Slope (ft/mi): 3.6-7.1

K1 (d^{-1}): 0.4-0.6

K2 (d^{-1}): 0.813-1.819

K3 (d^{-1}): ---

F ratio: 1.5:1

Stream characteristics: Drains to Indian Field Swamp

B. Model Input Sources

Waters in question? yes Literature: DHEC/EPA Agreement
Similar waters: _____
Field data available? fair
Describe field data:

C. Model Validity:

Intensive survey? no

Calibrated? no

Verified? no

Analyst's assessment of simulation: fair

Comments: ---

D. Model Outputs:

Ammonia model: chronic toxicity (mg/l): 2.08 critical, 4.36 seasonal

Dissolved oxygen model:

Critical BOD5 (mg/l): 8.05*

Critical NH3-N (mg/l): 0.5*

Effluent DO (mg/l): 6.0

Equivalent UOD: 26.95

UOD formula: 8.34*Q(0.225mgd)*(1.5*BOD5(8.05)+4.57*NH3-N(0.5))

Predicted minimum instream DO (mg/l): >4

Effluent flow (mgd/cfs): 0.225/0.348

Other parameters: ---

Comments: TP= MR; TN=MR. DO impaired stream, current permit UOD is maintained. Model values only and can vary as long as the UOD and toxicity requirements are met.

E. Have studies been conducted or is information available which would have an influence on the level of wastewater treatment needed? no If yes, attach comments.

F. Stream Classification: FW

G. Could the discharge be considered a wetland discharge? no If yes, attach comments from WQ Certification and Wetland Programs Section as needed.

H. Will the proposed discharge and recommended limits protect the existing uses of the waterbody? yes If no, attach a detailed explanation.

I. Is there evidence that the practical use of the stream is different from its classified use and may warrant alternate consideration? no If yes, attach comments.

J. Is there reason to believe that questionable benefits will result from requiring model recommendations? no If yes, attach comments.

Analyst: Feleke Arega Date: 07/07/2021

Reviewer: [signature] Date: 7/20/2021

II. Engineering Section

A. Do the model outputs exceed established technological limits for this type of wastewater? Yes - No If yes, explain below in the space provided.

B. Are there factors which make the model outputs inconsistent with best engineering judgment and/or federal effluent guidelines? Yes - No. If yes, explain below in the space provided.

C. Are there other factors which would make the WLA either more stringent or less stringent? Yes - No. If yes, explain below in the space provided.

D. Are there factors that make the water quality model outputs impractical or un-implementable at this time? Yes - No. If yes, explain below in the space provided.

E. Recommended limits

Flow: _____

BOD5 critical: _____ BOD5 seasonal: _____

NH3-N critical: _____ NH3-N seasonal: _____

UOD critical: _____ UOD seasonal: _____

Effluent DO: _____

Phosphorus: _____

Other parameters: _____

Engineering comments: _____

F. Is there agreement with water quality model outputs? Yes No

Engineer: _____

Date: _____

III. Water Quality Modeling Section

Is full agreement concluded? Yes - No

If full agreement is not reached, see the wasteload allocation procedures for further steps.

If yes, the wasteload allocation is:

Flow: _____

BOD5 critical: _____ BOD5 seasonal: _____

NH3-N critical: _____ NH3-N seasonal: _____

UOD critical: _____ UOD seasonal: _____

Critical limits apply: _____ through _____

Seasonal limits apply: _____ through _____

Effluent DO: _____

Phosphorus: _____

Other parameters: _____

Comments: _____

Approval: _____ Date: _____

SCDHEC Ammonia Toxicity Calculation

Based on 1999 EPA Water Quality Criteria for Ammonia as adopted by S.C. DHEC R.61-68 promulgated December 14, 2000, effective June 22, 2001.

Division of Water Quality

April 23, 2001, updated 10/05

Discharger Name:	Town of Harleyville
Permit Number:	SC0038504
Receiving Stream:	Tom and Kate Branch
Date:	07/07/2021
Analyst:	Feleke

Input Data

Upstream Flow (cfs):	0
Upstream Total Ammonia Concentration (mg N/L):	0.11
Critical Stream Temperature (deg. C):	26
Seasonal Stream Temperature (deg. C):	14
Stream pH:	7.5
Discharge Flow (mgd):	0.225
Are Salmonids Present? (yes/no):	no
Are Fish ELS Present? (yes/no):	yes

Instream Total Ammonia Toxicity Results

Season:	Critical	Seasonal
Criterion Maximum Concentration, CMC (mg N/L):	19.890	19.890
Criterion Continuous Concentration, CCC (mg N/L):	2.082	4.364

Discharge Total Ammonia Results

Season:	Critical	Seasonal
Max. Conc. Protecting Against Acute Toxicity (mg N/L):	19.89	19.89
Max. Conc. Protecting Against Chronic Toxicity (mg N/L):	2.08	4.36

Comments

default pH, temperatures and background NH3

S.C. DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL
BUREAU OF WATER
DIVISION OF WATER QUALITY
303(d), MODELING, AND TMDL SECTION

Date: 07/07/2021 Engineer: WLA Type: Basin Review
Discharger: Town of Harleyville NPDES: SC0038504
County: Dorchester WMU: 0203 HUC: 03050206-02-04
Receiving waters: Tom and Kate Branch

I. Water Quality Modeling Section

A. Model Data:

Model used: QUAL2E

Name: tomkate.in

USGS station / site:02174150

Unit 7Q10 (cfs/mi^2): 0.0

Stream critical flow (cfs): 0.00 Critical flow type: 7Q10

Avg. annual flow (cfs): 1.16

Drainage area (mi^2):1.21

Stream Q: waste Q ratio: 0:0.225

Temp critical (F/C): 78.8 / 26

Temp seasonal (F/C): 57.2 / 14

Velocity (ft/s): 0.115-0.200

Slope (ft/mi): 3.6-7.8

K1 (d^{-1}): 0.4-0.6

K2 (d^{-1}): 0.581-1.305

K3 (d^{-1}): ---

F ratio: 1.5:1

Stream characteristics: Drains to Indian Field Swamp

B. Model Input Sources

Waters in question? yes Literature: DHEC/EPA Agreement
Similar waters: _____
Field data available? fair
Describe field data:

C. Model Validity:

Intensive survey? no

Calibrated? no

Verified? no

Analyst's assessment of simulation: fair

Comments: ---

D. Model Outputs:

Ammonia model: chronic toxicity (mg/l): 2.08 critical, 4.36 seasonal

Dissolved oxygen model:

Critical BOD5 (mg/l): 11.31*

Critical NH3-N (mg/l): 1.0*

Effluent DO (mg/l): 6.0

Equivalent UOD: 26.95

UOD formula: 8.34*Q(0.15mgd)*(1.5*BOD5(11.31)+4.57*NH3-N(1.0))

Predicted minimum instream DO (mg/l): <4

Effluent flow (mgd/cfs): 0.15/0.23

Other parameters: ---

Comments: TP= MR; TN=MR. DO impaired stream, current permit UOD is maintained. * only model input values and can vary as long as UOD and Toxicity limits allow

E. Have studies been conducted or is information available which would have an influence on the level of wastewater treatment needed? no If yes, attach comments.

F. Stream Classification: FW

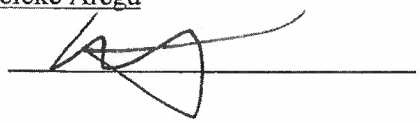
G. Could the discharge be considered a wetland discharge? no If yes, attach comments from WQ Certification and Wetland Programs Section as needed.

H. Will the proposed discharge and recommended limits protect the existing uses of the waterbody? yes If no, attach a detailed explanation.

I. Is there evidence that the practical use of the stream is different from its classified use and may warrant alternate consideration? no If yes, attach comments.

J. Is there reason to believe that questionable benefits will result from requiring model recommendations? no If yes, attach comments.

Analyst: Feleke Arega Date: 07/07/2021

Reviewer:  Date: 7/20/2021

SCDHEC Ammonia Toxicity Calculation

Based on 1999 EPA Water Quality Criteria for Ammonia as adopted by S.C. DHEC R.61-68 promulgated December 14, 2000, effective June 22, 2001.

Division of Water Quality

April 23, 2001, updated 10/05

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Are Salmonids Present? (yes/no):	no
Are Fish ELS Present? (yes/no):	yes

Instream Total Ammonia Toxicity Results

Season:	*Critical*	*Seasonal*
Criterion Maximum Concentration, CMC (mg N/L):	19.890	19.890
Criterion Continuous Concentration, CCC (mg N/L):	2.082	4.364

Discharge Total Ammonia Results

Season:	*Critical*	*Seasonal*
Max. Conc. Protecting Against Acute Toxicity (mg N/L):	19.89	19.89
Max. Conc. Protecting Against Chronic Toxicity (mg N/L):	2.08	4.36

Comments

default pH, temperatures and background NH3

APPENDIX B
Vendor Provided Purestream Equipment Design Proposal

purestream ES
ADVANCED ENVIRONMENTAL TREATMENT SYSTEMS

DATE: 02/21/23
TO: All bidding contractors

RE: Sewage Treatment Equipment for:
Harleyville Expansion

Proposal No. BJB-110421-HV(Rev2)

We are pleased to present for your consideration 1 PURESTREAM ES, LLC Biologically Enhanced Single Sludge Treatment (BESST) System; Model PES-75-C sewage treatment plant equipment package capable of treating 75,000 G.P.D. of raw sewage with a strength of 210 mg/l B.O.D., 284 mg/l TSS, 40 mg/l free ammonia, and 8 mg/l phosphorus, as manufactured by Purestream ES, LLC, Florence, KY. The treatment plant shall consist of all necessary clarifiers, weirs, baffles, internal piping, and the following items:

SURGE CONTROL EQUIPMENT

1 Aerated surge tank piping package with air headers, diffuser drops, and diffusers.
1 3 way flow splitter box
1 EQ tank blower, 2 Hp for 38 CFM with fiberglass housing

BASE UNIT & AIR SUPPLY

1 Anoxic compartment piping package
2 1.9 HP mixers with slide rails
1 Aeration compartment piping package with air headers, diffuser drops, and fine bubble diffusers
1 Prewired control panel with starters, breakers and timers in a NEMA rated 12 [X] painted steel Enclosure, relay type controls
1 Clarifier with a total volume of 13,493 gallons. Clarifier will be complete with a baffled effluent trough with adjustable weir plates. The clarifier will be fabricated of painted steel.
1 Aerated sludge storage tank piping package with air headers, diffuser drops, and coarse bubble diffusers
1 Adjustable Halliday hoist with hoist sockets as necessary for retrieval of submerged equipment
2 Process blowers, 7.5 Hp for 129 CFM with fiberglass housings
1 SHT blower, 2 Hp for 38 CFM with fiberglass housing
1 RAS airlift blower, 2 HP for 30 CFM with fiberglass housing
2 Bridges with grating and handrail to service tank equipment

THE FOLLOWING ITEMS ARE NOT COVERED BY THE QUOTATION AND SHALL BE PROVIDED BY OTHERS. PLEASE NOTE THAT THIS LIST IS NOT ALL INCLUSIVE AND ONLY THE ITEMS SPECIFICALLY LISTED WITHIN THIS PROPOSAL ARE INCLUDED IN THIS OFFERING.

Excavation	Crane to set tank on pad
Removing tank from truck	Hook up of prewired components
Electric to control panel	Field erection
Finish grading & seeding	Sewage lines

External piping	Fencing
Backfilling	Concrete
Water to fill tank	Anchors & turnbuckles

The tankage shall be shipped to the jobsite in multiple pieces.
The heaviest piece shall weigh approximately 17,500 lbs.

TOTAL NET PRICE [X] F.O.B. Factory, Freight allowed to jobsite..... [redacted]
(Price does not include any Local, State or Federal taxes.)

OPTIONAL EQUIPMENT ADD PRICING

One (1) Replacement blower motor unit for existing plant…… [redacted]
One (1) Replacement EQ Pump for existing plant……
One (1) Replacement Mixer for existing plant……..

Delivery after receipt of order & approval drawings 22-26 weeks.

Open for Acceptance for 30 days until 11:59 PM ET on 03/22/23

PAYMENT TERMS: 10% Due With Purchase Order, **40%** Due With Release for Fabrication, **45%** Due prior to loading for Shipment, **5%** Due Upon Completion of Start-Up and Not To Exceed 90 Days from Date of Shipment

Time is of the essence in this contract. Once the contractor has been notified that the treatment plant is ready to ship, they MUST receive shipment within thirty (30) days of notification. If shipment does NOT occur within thirty (30) days because of delays out of Purestream ES, LLC's control (delays consisting of, but not limited to, bad site conditions, weather, approval delays, acts of God, war, terrorism, etc.), immediate payment of 95% must be paid or the Buyer will be in breach of this contract and Purestream ES, LLC may seek a remedy through any legal means at their disposal. In addition, there will be a 2% per month finance charge on the full amount of the Purchase Order, which MUST be paid before the plant will ship.

NOTE: This order is subject to terms and conditions contained herein and Purchaser agrees to be bound thereby.

TERMS AND CONDITIONS

I. SCOPE OF PROPOSAL

A. The Proposal attached herein reflects the full scope of services and equipment to be provided by **Purestream** and no other services are included by implication. Specifically, **Purestream** does not and will not (a) characterize the wastewater to be treated, (b) determine the volume of wastewater in need of treatment, (c) determine the amount of pre-treatment equalization or filtering needed, if any, or (d) ascertain the discharge limits applicable to purchaser's Project.

B. It is expressly understood by Purchaser that Purchaser is responsible for providing **Purestream** with accurate information relating to the characteristics of the wastewater (including but not limited to flow rate, waste strength, and water temperature) to be treated by the **Purestream** system quoted herein (the "System"), the applicable discharge limits, and the degree of variability, if any, anticipated in the wastewater characteristics. Purchaser understands that **Purestream** will rely on this information from Purchaser to calculate the size of the System, and select appropriate equipment such as pumps, blowers, and other items. Purchaser acknowledges and agrees that **Purestream** is not responsible for deficient System performance if information provided to it does not reflect the actual conditions to which the System is subjected. By placing an order in response to this Proposal, Purchaser represents that it has provided accurate information and that **Purestream** is relying reasonably thereon in making the Proposal.

II. CREDIT TERMS

Any order given to, or received by, **Purestream** is subject to credit approval by **Purestream.** Payment requirements are as outlined in the Proposal. **A service charge of up to one and one-half per cent (1 ½%) per month** may be assessed against **Purchaser** on any amount due and not paid when due.

III. PRICE ESCALATION
The price quoted herein is firm on all orders for sixty (60) days from the effective date of any contract between **Purchaser** and **Purestream** resulting from this proposal. The project must be released for production by the **Purchaser** within this sixty (60) day period. If the project is not released for production by the **Purchaser** within this sixty (60) day period, the price quoted by **Purestream** is no longer guaranteed, but may, at **Purestream's** discretion, be adjusted based on changing market conditions, including, but not limited to, increases in costs of materials, components, or shipping.

IV. CANCELLATION
Purchaser acknowledges that the System contemplated by this Proposal is custom made for **Purchaser's** specific application, and therefore, any order made in response to this Proposal cannot be cancelled without **Purestream's** prior written consent. In case of cancellation, **Purchaser** agrees to reimburse **Purestream** for all costs incurred, plus liquidated damages in the amount of either twenty percent (20%) of the expenses incurred at the point of cancellation, or ten percent (10%) of the amount of the order, whichever is greater. Expenses, for purposes of this section, include costs incurred in fabrication, costs incurred to third party vendors, and in-house labor expended at rates prevailing at the time.

V. STORAGE
Purestream will withhold shipment of the equipment purchased hereunder at **Purchaser's** request without charge for fifteen (15) days from the originally scheduled shipment date; provided however, **Purchaser** will be invoiced for equipment as of the date the equipment is completed and ready for shipment. After such fifteen (15) days, a storage charge of one hundred dollars ($100.00) per day will be assessed and added to the purchase price hereunder, at the option of **Purestream. I**f the equipment is paid for in advance, it may be stored for sixty (60) days beyond the scheduled date at no charge to the **Purchaser.**

VI. TAXES and TRANSPORTATION ISSUES
Any and all sales, use, excise or other tax levied upon the Equipment contemplated by the system or upon the sale, use, receipt, manufacture, delivery or transportation of such equipment, or upon **Purestream** by reason of the performance of an order made in response to this Proposal, shall be added to the purchase price and shall be separately stated on **Purestream's** invoice at the time of billing. Responsibility for the payment of any such tax shall be the **Purchaser's**. Any increase in transportation rates, for whatever reason, shall be borne and paid by the **Purchaser**.

Delivery of the equipment covered hereby to a common carrier shall be deemed delivery to **Purchaser,** and thereupon the risk of loss or damage in transit shall be **Purchaser's**. In the absence of specific instructions, **Purestream** will select the carrier.

Upon delivery, **Purchaser** and/or **End User** and/or any agents or representatives thereof shall be responsible for timely inspecting all equipment, materials, and other items shipped as part of the System. **Purchaser** and/or **End User** must inform **Purestream** within ten (10) days of delivery, in accordance with the instructions provided with **Purestream**, of any missing or damaged items. **Purestream** will provide and/or replace, at its cost, any missing or damaged items identified within this ten (10) day period. If **Purchaser** and/or **End User** fails to provide notice to **Purestream** of missing or damaged items within this ten (10) day time period, all items listed on the equipment packing lists shall be deemed to have been shipped and received, free of damage, and **Purestream** shall have no further responsibility to provide replacement items at its cost, except as provided in Section VII., below.

VII. TITLE TRANSFERS UPON DELIVERY AND FINAL PAYMENT
Title to the goods listed in this Proposal shall not pass to **Purchaser** until such goods are paid for in accordance with the payment terms outlined in the Proposal and incorporated into any order made in response to this Proposal.

Any warranty offered by a third-party manufacturer of any equipment included in this Proposal that is, by its terms, transferrable, will be deemed transferred by **Purestream** to **Purchaser** upon receipt final payment to **Purestream**. Whether the third-party warranty is transferrable from **Purchaser** to any separate **End User** or other assignee is determined solely by the terms and conditions of the third-party warranty.

VIII. WARRANTY
A. EQUIPMENT WARRANTY: For a period of two (2) years from the date of start-up and not to exceed 30 months from date of shipment of the equipment set forth herein, **Purestream** warrants that said equipment will be in kind and quality as described herein and will be free from defects in workmanship, if properly installed and operated under normal use and service and in accordance with the plaint Operation and Maintenance manual. **Purestream's** obligation hereunder is limited solely to furnishing without charge, f.o.b. factory, replacement parts for the equipment or any part thereof which have been found by **Purestream** to have been defective within the warranty period; provided however, that **Purchaser** notifies **Purestream** in writing of such defect, as soon as the alleged defect becomes apparent.

B. LIMITED CONDITIONAL PERFORMANCE WARRANTY: Purestream warrants that within 60 days of startup, the System will adequately perform to reduce the strength of the waste to the effluent levels listed in the Proposal, provided that all of the below conditions stated in this "Limited Conditional Performance Warranty" section are met for the initial sixty (60) day start up period. Thereafter, provided that all such conditions are met for a period of 90 days (or the number of days since start up, whichever is shorter) preceding any claim made under this Limited Conditional Performance Warranty, Purestream warrants that the System will adequately perform to reduce the strength of the waste to the effluent levels listed in the Proposal. The conditions required to be met for this Performance Warranty to be effective are:

1. The project engineer for Purchaser and/or End User has personally confirmed the basis of design for the System, has reviewed all sizing and air requirement calculations performed by Purestream; and has approved the final approval submittals.
2. The System was properly installed and has not undergone any modifications without Purestream's prior written approval.
3. The System is, at all times, operated in accordance with the Operation and Maintenance Manual provided with the System by Purestream, unless specifically directed otherwise by Purestream, and with all components in working order.

4. The System is, at all times, operated by a licensed wastewater treatment plant operator who spends at least 8 hours per week on site operating the plant.
5. Purchaser / End User keeps daily logs (5 days per week or more, for every week) that record the following process control data based on bench / on-site testing: (a) influent ammonia, nitrate, nitrite, pH and temperature; (b) anoxic tank dissolved oxygen and pH; (c) aerobic tank dissolved oxygen and pH; (d) effluent ammonia, nitrate, nitrite, pH and temperature; (e) gallons of wasted sludge; (f) clarifier settleability; and (h) flow.
6. Independent laboratory testing on samples taken, on average, at least every 10 days, of influent and effluent for at least each constituent on Purchaser / End User's discharge permit, but including at least the following: CBOD5, ammonia, TKN (Total Kjeldahl Nitrogen), nitrate, nitrite, pH, and total suspended solids.
7. None of the influent waste characteristics exceed the values given to Purestream as the basis of design (including flow rate and temperature) by more than ten percent (10%) of the basis of design. Whether a value deviates from the basis of design by more than ten percent (10%) shall be determined by the average of no less than 8 test results from testing of plant influent by independent laboratories over the ninety (90) days preceding any warranty claim.
8. None of the influent waste characteristics exceed the values given to Purestream as the basis of design (including flow rate and temperature) show a spike or slug loading wherein any influent waste characteristic's value deviates by more than twenty-five percent (25%) from the basis of design at any point over the ninety (90) days preceding any warranty claim, as shown in either process control data, independent laboratory testing, or under Extended Testing Protocols.
9. The influent does not contain toxic compounds or compounds generally recognized to inhibit performance of biological wastewater treatment processes above the concentrations listed in Table 5-2 from *Wastewater Engineering, Treatment, Disposal, Reuse*, Metcalf & Eddy (3rd Edition).

EXCEPT FOR CONDITIONS 1 AND 2, THE FAILURE OF THESE CONDITIONS TO BE MET CONTINUOUSLY FOR A PERIOD OF 90 DAYS PRIOR TO ANY WARRANTY CLAIM BEING MADE SHALL OPERATE TO RELIEVE PURESTREAM OF ANY AND ALL OBLIGATONS WITH RESPECT TO THE INADEQUATE PERFORMANCE OF THE SYSTEM AND THE REMEDIATION THEREOF. CONDITIONS 1 AND 2 SHALL BE DEEMED TO HAVE BEEN CONTINUOUSLY MET ONCE SATISFIED FOR THE FIRST TIME, EXCEPT THAT SO MUCH OF CONDITION 2 THAT REQUIRES THAT THE SYSTEM NOT BE MODIFIED WITHOUT PURESTREAM'S PRIOR WRITTEN APPROVAL IS AN ONGOING CONDITION THAT MUST BE CONTINUOUSLY MET.

The System will be deemed to have adequately performed to reduce the strength of the waste to the effluent levels listed in the Proposal if the average concentration or amount of each constituent listed in the target effluent in the Proposal over any fourteen day (14 day) period is equal to or lower than the effluent levels stated in the proposal, whether or not conditions 7 and 8 are met.

Purestream's obligations under this Limited Conditional Performance Warranty are limited to performing, at its cost (unless otherwise noted), the following functions: (a) review of all testing data; (b) directing and reviewing Extended Testing Protocols, as needed; (c) providing a factory-authorized representative to perform up to 10-days of on-site diagnostic work, training, and implementing recommendations to improve System performance; and (d) providing up to a total of Five Thousand and 00/100 Dollars ($5,000.00) for parts and labor for the alteration or modification of the System to improve performance. For purposes of this Limited Conditional Performance Warranty, "Extended Testing Protocols" means influent and effluent laboratory testing for a period of time and at a frequency determined by Purestream or its factory-authorized representative to be reasonably necessary to evaluate System performance, the cost of which shall be borne by Purchaser (or End User). The failure by Purchaser (or End User) to provide testing data timely upon request by **Purestream**, or to permit Extended Testing Protocols, or to permit **Purestream** or its factory-authorized representative access to the System, or the modification of the System without the prior approval of **Purestream**, shall render this Limited Conditional Performance Warranty null and void, notwithstanding compliance with the above conditions. Under no circumstances shall this Limited Conditional Performance Warranty extend to any constituent of the influent waste that is not capable of removal by biological means, such as dissolved solids. Further, equipment defects are governed exclusively by the Equipment Warranty set forth in Section VII.A. of these Terms and Conditions. Inadequate System performance attributable to an equipment defect, failure, or breakdown does not give rise to any obligation on Purestream's part to repair or replace the equipment in order to establish or re-establish adequate system performance, unless the Equipment Warranty applies.

THIS WARRANTY IS EXPRESSLY MADE IN LIEU OF ANY AND ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS. IN THE EVENT ANY IMPLIED WARRANTY IS NONETHELESS IMPOSED BY OPERATION OF LAW, THE DURATION OF ANY SUCH IMPLIED WARRANTY IS LIMITED TO ONE YEAR FROM THE DATE OF SHIPMENT OF THE PRODUCT, AS SET FORTH IN THE FIRST PARAGRAPH OF THIS SUBSECTION.

Any Warranty from **Purestream** granted hereunder is fully transferrable to any **End User** who is a successor or assign of the Purchaser, and any further successors and assignees of the **End User** during the period of time any Warranty is in effect. No such transfer shall in any way re-start the warranty period or otherwise extend the warranty period stated herein.

IX. LIABILITY

Purestream shall not be liable for incidental or consequential damages or expenses relating directly or indirectly, to the sale or use of the equipment, including but not limited to costs and expenses charged by the operator of the System. **Purestream's** liability hereunder is expressly limited to furnishing replacement parts / components (or, at **Purestream's** sole election, crediting **Purchaser** with an amount equal to the purchase price of such replacement part), or, for matters falling within the scope of a Warranty offered hereunder, rendering performance, where due, under the terms and conditions of the applicable warranty. Under no circumstances shall **Purestream** be responsible or liable for any damages or losses from errors or performance deficiencies arising from matters not within the scope of its proposal, including but not limited to site preparation, construction, installation or operation of the System; the failure to accurately predict flow rates; the failure to accurately characterize influent wastewater; the failure to properly monitor, test, and operate the system; and the like. Further, **Purestream** shall not be liable for damages, losses, expenses or delays due to or caused by labor shortage, fire, transportation difficulties, strike or other labor disputes, civil or military authority, insurrection, riot, war, mass casualty events, accident, shortage of labor and/or material, flood, storm, acts of the

Purchaser, priorities in allocations, pandemics (including governmental restrictions imposed to contain same), or any other cause or circumstances whether like or unlike the foregoing, beyond **Purestream's** reasonable control. Acceptance by **Purchaser** of the equipment comprising the **System** from the carrier shall constitute a waiver of any claim for losses or damages due to delay, whether or not excused by the foregoing, and a waiver of the right to revoke such acceptance for any reason.

UNDER NO CIRCUMSTANCES SHALL PURESTREAM BE LIABLE FOR ANY LIQUIDATED, SPECIAL OR CONSEQUENTIAL DAMAGES OR FOR ANY FINES OR PENALTIES, WHETHER ANY SUCH DAMAGES ARE CHARACTERIZED AS DIRECT OR INDIRECT.

Purestream shall not be liable for damages, losses or expenses incurred by reason of tank floatation, shall not be responsible for keeping the tank or excavation free from mud or debris.

X. INSURANCE COVERAGE

Purestream carries commercial general liability insurance coverage with policy limits of $1,000,000.00 per occurrence / $2,000,000.00 aggregate, umbrella coverage with policy limits of $2,000,000.00 per occurrence / $2,000,000.00 aggregate, and workers compensation coverage with policy limits of $500,000.00 per accident / $500,000.00 aggregate. Any Additional Coverages or Higher Limits of Liability required as per the final signed contract can be obtained; **PROVIDED, HOWEVER, ANY ADDITIONAL LIMITS OR COVERAGES REQUIRED WILL BE AT THE PURCHASER'S EXPENSE**

XI. GENERAL TERMS AND DEFINITIONS

A. In the event of a conflict between the general terms and conditions stated herein and the terms and conditions stated in the **Purchaser's** purchase order, or elsewhere, these general terms and conditions shall govern. **Purchaser's** signed acceptance of this proposal, purchase order, or any other expression of acceptance shall be deemed to be a written conformation and acceptance of these general terms and conditions. Further, acceptance of this order is expressly limited to these general terms and conditions. Any conduct of performance by **Purestream** regarding the existence of a contract shall not constitute an acceptance of or assent to any additional or different terms or provisions proposed by **Purchaser.** Any modification of these Terms and Conditions must occur through a writing signed by an authorized representative of **Purestream** employed by its home office in Walton, Kentucky, to be effective. **Outside sales representatives of Purestream do not have the authority to alter these Terms and Conditions.**

B. The validity, construction and effect of this order and of these general terms and conditions, including all warranties and warranty disclaimers, shall be governed by the laws of the Commonwealth of Kentucky, without regard to choice of law principles. Any dispute arising in any way out of this proposal shall be resolved via arbitration in accordance with the then-effective provisions of the Construction Industry Arbitration Rules of the American Arbitration Association, including the arbitrability of the dispute in question is subject to this provision. The arbitration hearing shall take place within 25 miles of **Purestream's** office. The award rendered by an arbitrator shall be final, and the award may be reduced to a judgment by any court whose jurisdictional borders include the location of the hearing. A demand for arbitration shall be filed within a reasonable time after a dispute arises. In no case, however, shall the demand be made more than one year after the date of startup of the System.

C. As used in these terms and conditions:

"**Purestream**" refers to either Purestream, Inc., a Kentucky corporation, or Purestream ES, LLC, a Kentucky limited liability company, whichever company is the entity making the proposal to which these Terms and Conditions relate.

The term "**End User**" means the person or entity that ultimately will own the System described in this Proposal when the System is installed and started up, if not the same person or entity as the Purchaser. End User may include, as the context may require, any person or entity acting on Purchaser's behalf including contractors, engineers, or architects retained by End User.

The term **"Purchaser"** means the person or entity issuing a purchase order for the purchase of the System, if a person or entity other than the End User. Purchaser may include, as the context may require, any person or entity acting on Purchaser's behalf including contractors, engineers, or architects retained by Purchaser.

The Term "**Proposal"** means the proposal made by or on behalf of Purestream ES, LLC for the sale of certain wastewater treatment equipment and specifically enumerated ancillary services (including, to the extent listed in the proposal start up and training services, and tank sizing recommendations).

The term **"System"** means the equipment listed in the Proposal (including any tanks) assembled and operating for the purpose of wastewater treatment.

Agreed to by:

Purchaser: _____

Print Name and Company: _____

Date: _____

THE ABOVE PROPOSAL WILL RESULT IN A FIRM ORDER WHEN ACCEPTED BY THE PURCHASER AND ONLY WHEN APPROVED BY AN AUTHORIZED OFFICER OF PURESTREAM ES, LLC.

SUBMITTED BY:
PURESTREAM ES, LLC.

Brian J. Bell
Brian J. Bell

DATE: 02/22/23

APPENDIX C
Cost and Effectiveness Certification Form, DHEC 3152

Cost and Effectiveness Certification

SRF Project Number SRF No. 801-01

Project Name Harleyvill WWTP Upgrade

Project Sponsor Town of Harleyville, SC

Section 602(b)(13) of the Federal Water Pollution Control Act (FWPCA) requires a recipient of a loan to certify that the recipient:

1) has studied and evaluated the cost and effectiveness of the processes, materials, techniques, and technologies for carrying out the proposed project or activity for which assistance is sought under the Clean Water State Revolving Fund Loan Program; and
2) has selected, to the maximum extent practicable, a project or activity that maximizes the potential for efficient water use, reuse, recapture, and conservation, and energy conservation, taking into account –
   (i) the cost of constructing the project or activity;
   (ii) the cost of operating and maintaining the project or activity over the life of the project or activity; and
   (iii) the cost of replacing the project or activity.

Pursuant to Section 602(b)(13) of the FWPCA, all Project Sponsors will evaluate and certify that cost and effectiveness has been addressed as part of the Preliminary Engineering Report.

Certification

Pursuant to Section 602(B)(13), we certify that the requirements of Section 602(B)(13), as set forth in items (1) and (2) above, have been completed.

Signature of Project Engineer

Dan Huggins

Printed Name of Project Engineer

Signature of Project Sponsor's Representative

Honorable Charles Ackerman

Printed Name of Project Sponsor's Representative

Submit by email to DHEC project manager or by mail to:
SRF Section - Water Facilities Permitting Division, S.C. DHEC, 2600 Bull Street, Columbia, SC 29201

INSTRUCTIONS – DHEC 3152

PURPOSE: The *Cost and Effectiveness Certification* is used to certify that an SRF Project Sponsor has complied with the actions required by Section 602(b)(13) of the Federal Water Pollution Control Act (FWPCA).

GENERAL INFORMATION: Pursuant to Section 602(b)(13) of the FWPCA, US EPA requires SRF Project Sponsors to conduct a cost and effectiveness analysis and to select, to the maximum extent practicable, a project or activity that maximizes the potential for water and energy conservation, as appropriate. This requirement applies to any Clean Water project (e.g., wastewater, stormwater, non-point source) where the Project Questionnaire was submitted on or after October 1, 2015.

INSTRUCTIONS: The Project Engineer or the Project Sponsor's Representative enters the project information. The Project Engineer and the Project Sponsor's representative sign the Certification.

Submit this form with the Preliminary Engineering Report for the proposed project.

DHEC REVIEW AND FILING: The SRF Section will use this form to document compliance with Section 602(b)(13) of the FWPCA by an SRF project. The form will be kept in the PER file for the named project and will be retained for twenty years following the final SRF disbursement to the Project Sponsor - per Retention Schedule 15796.

APPENDIX D

Proposed Improvements at Harleyville WWTP

VERTICAL BENCHMARK
RAILROAD SPIKE IN BASE
OF PINE TREE
EL=100.00 (ASSUMED)

ACCESS ROAD

APPROXIMATE PROPERTY LINE (S86°46'08"E FROM TOWN'S PLAT)

GRADE TO MATCH EXISTING GROUND SURFACE

GATE

N

EXISTING SLUDGE DRYING BEDS

30.0'

30.0'

EXISTING MANHOLE

AERATION TANK #2

CLARIFIER #2

SOIL BORING SB-1

ANOXIC TANK #2

SLUDGE HOLDING TANK

SURGE TANK

T.O.W. EL.: 103.43

CLARIFIER #1

ANOXIC TANK #1

AERATION TANK #1

2.0'

21.0'

5.0'

PAD EL. 99.32

UV WASH Top of wash EL: 101.24

TRIANGULAR DITCH
AT 0.90% SLOPE
SEE DETAIL 1

CHLORINE BLDG.
SLAB EL: 99.91

EXISTING AIR BLOWERS

EXISTING POWER POLE W/LIGHT

EXISTING EFFLUENT MANHOLE

EXISTING CHLORINATION TANK

EXISTING SECONDARY CLARIFIERS

EXISTING RBC UNIT

EXISTING SLUDGE DIGESTION

EXISTING SURGE TANK

EXISTING POWER POLE W/LIGHT

EXISTING DE-CHLORINATOR MANHOLE

EXISTING 6' CHAIN LINK FENCE

40.0'

EL: 101.97

EXISTING TOPOGRAPHIC CONTOUR
(FROM ASSUMED ELEV. BENCH MARK)

LEGEND

100 EXISTING GROUND SURFACE CONTOUR

100 PROPOSED GROUND SURFACE CONTOUR

0' 5' 10' 20'

DEMOLISH:

1. EXISTING MAINTENANCE SHED
2. PREVIOUS TREATMENT SYSTEM
3. EXISTING SLUDGE DRY BED

NEW:

1. INFLUENT SCREEN
2. FLOW SPLITTER
3. 75,000 GPD PURESTREAM PACKAGE PLANT
4. UV SYSTEM
5. FUTURE ROTARY PRESS FOR SLUDGE DEWATERING
6. FUTURE MAINTENANCE/ STORAGE/ SCADA BUILDING
7. ROAD

PRELIMINARY

ENGINEER SEAL

NO.	DATE	REVISION	BY
DESIGNED BY:		DRAWN BY:	CHECKED BY:
			APPROVED BY:

HARLEYVILLE UPGRADE TO WWTP

SOUTH CAROLINA AUTHORIZATION OF CERTIFICATE ARDURRA GROUP No. 6082

ARDURRA
COLLABORATE. INNOVATE. CREATE.
4000 FABER PLACE DR. SUITE 330
NORTH CHARLESTON, SC 29405
PH. 843-628-3352

FILE	SEE LEFT
	VERIFY SCALE
	BAR IS ONE INCH ON ORIGINAL DRAWING 0 1"
DATE	FEBRUARY 2023
PROJ.	100467.05
DWG.	

APPENDIX E

FEMA Flood Map

National Flood Hazard Layer FIRMette

FEMA

80°27'53"W 33°12'51"N

80°27'16"W 33°12'21"N

Feet 1:6,000

0 250 500 1,000 1,500 2,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 4/10/2023 at 8:53 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.