THE TOWN OF
Batesburg-Leesville
DEPARTMENT OF PUBLIC WORKS

REQUEST FOR PROPOSALS
WASTEWATER TREATMENT PLANT AERATION EQUIPMENT
July 2020

The Town of Batesburg-Leesville, South Carolina proposes to replace the aerators in one of its two wastewater treatment basins. The wastewater treatment plant has a permitted capacity of 2.5 MGD and currently utilizes the Orbal activated sludge process for treatment. The Town proposes to discontinue use of the Orbal disk aeration system and install floating brush aerators as a replacement. This project is being funded, in part, by a Community Development Block Grant (CDBG).

This work is considered an emergency replacement and, as such, the Town is requesting proposals from floating brush aerator manufactures for providing the necessary equipment. Upon selection of an equipment manufacturer the Town will issue a purchase order for the equipment so that manufacturing can begin while construction plans and specifications for ancillary work are being prepared and approved by CDBG and the State and while bids for equipment installation and other plant improvements are being received from general contractors.

The wastewater treatment plant layout is shown on Exhibit 1. Exhibit 2 provides basin dimensions, channel widths, channel volumes, etc. The plant is located at 100 Commissioner Street Batesburg-Leesville, S.C. 29070. Replacement aerators are to be provided for Aeration Basin No. 1. The existing Orbal basin consists of four concentric channels approximately 5.5 feet deep each. For each aeration basin, there are currently two 50 Hp drive units (one on the outside channel at the north side of the basin and one on the outside channel at the south side of the basin) and two 25 Hp drive units at the center island. The Orbal aeration system to include drives, shafts, bearings, disks, etc. will be removed from the basin by the general contractor as part of the overall project.

The wastewater plant treats primarily domestic waste with the following characteristics:

BOD_5	200 mg/l
TSS	190 mg/l
Ammonia	40 mg/l
Ph	7 su

For other information concerning the wastewater treatment plant or questions concerning the project, contact:

Summit Engineering Group, Inc.
9601 Warren H. Abernathy Boulevard
Spartanburg, S. C. 29301

Attn: Mr. Jim Longshore, P.E
Phone: (864) 949-1111
Email: jlongshore@summitengineeringgroup.com

Site visits can be coordinated through Summit Engineering Group.

The Town is interested in purchasing a complete aeration system to include aerators, floats, mooring accessories, splash guards, dissolved oxygen control system, electrical panels and controls, hardware, etc. for a complete and proper installation. A general contractor will be selected by the Town to work with the brush aerator supplier for equipment installation and to perform other work. The aeration equipment manufacturer should coordinate with the general contractor concerning installation, startup, etc.

Treatment Plant Effluent Limits

Following are current NPDES effluent limits for the wastewater treatment plant:

Following limits are based on the average design flow of: 2.5 MGD									
EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS						MONITORING REQUIREMENTS		
	Pounds per Day			Other Units					
	Monthly Average	Weekly Average	Daily Maximum	Monthly Average	Weekly Average	Daily Maximum	Measurement Frequency	Sample Type	Sample Point
Flow	---	---	---	MR MGD	MR MGD	---	Weekly	Cont.	Eff.
BOD_5	626	939	---	30 mg/l	45 mg/l	---	Weekly	24 Hr C	Eff.
TSS	626	939	---	30 mg/l	45 mg/l	---	Weekly	24 Hr C	Eff.
NH_3-N (Mar-Oct)	48	72	---	2.3 mg/l	3.5 mg/l	---	Weekly	24 Hr C	Eff.
NH_3-N (Nov-Feb)	50	75	---	2.4 mg/l	3.6 mg/l	---	Weekly	24 Hr C	Eff.
TRC**	0.27	---	0.46	0.013 mg/l	---	0.022 mg/l	Weekly	Grab	Eff.
DO	---	---	---	5.0 mg/l Minimum at all times			Weekdays	Grab	Eff.
pH	---	---	---	6.0 - 8.5 Standard Units			Weekdays	Grab	Eff.
BOD_5 (% Removal)*	---	---	---	85% (Minimum)	---	---	1/Month	Calc.	---
TSS (% Removal)*	---	---	---	85% (Minimum)	---	---	1/Month	Calc.	---
Total Phosphorus**	MR	MR	---	MR mg/l	MR mg/l	---	1/Quarter	24 Hr C	Eff.
Total Nitrogen §	MR	MR	---	MR mg/l	MR mg/l	---	1/Quarter	Calc.	Eff.
Total Copper (Cu)**	1.355	---	1.835	0.065 mg/l	---	0.088 mg/l	1/Month	24 Hr C	Eff.
Total Mercury (Hg)**	MR		MR	MR mg/l		MR mg/l	1/Year	Grab	Eff.
Dichlorobromomethane**	MR	---	MR	MR mg/l	---	MR mg/l	1/Month	Grab	Eff.

* See Part V.H. **See Part V.G.5 § This should be reported as a sum of TKN and Nitrate/Nitrite Nitrogen sampling. See Part V.G.5.

Manufacturer Qualifications

Equipment suppliers should have been producing floating brush aerators for at least ten years and have a minimum of ten wastewater treatment plant installations currently in operation in the United States. Provide a list of installations with names and contact information of the individual responsible for operation.

Equipment Description

Provide a detailed description of aerators and DO control equipment proposed to include, as appropriate, drawings, specifications, oxygen transfer data, mixing data, etc. as necessary to clearly describe the items being proposed.

The number, location and size of new aerators should be recommended by the equipment manufacturer. Manufacturers are responsible for verifying basin size, channel dimensions and volumes, plant loading, etc. that would affect their recommendation for equipment installation.

Equipment and Installation Specifics

Provide a layout or description of the number size and location of aerators recommended for the Batesburg-Leesville treatment plant along with sizing calculations to support the recommendation. The completed installation should allow the plant to operate and satisfactorily meet its NPDES permit limits. DO transfer capability and basin mixing information should be clearly stated. The proposal should include a DO control system to automatically start/stop aerators or otherwise control DO within the basin.

Process design calculations should incorporate the following:

Summer Temperature	25° C
Average Daily Flow	1.25 MGD per aeration basin
MLSS concentration	3,500 mg/l (other MLSS concentrations may be considered)
Minimum Channel Velocity	0.8 fps

Equipment Cost

Provide a cost proposal for all equipment recommended. This should include all costs of providing aerators, control panels, DO control system, recommended spare parts, lubricants, startup, operator training, initial service, shipping, etc. Proposals should state that costs will not increase for at least ninety days.

The proposal may include alternate or upgrade items for the Town's consideration. The cost of each such item shall be clearly stated.

Equipment Delivery Schedule

Provide a schedule for project submittals (drawings, schematics, calculations, etc.) and equipment delivery. Cost proposal should include a $500.00 per day cost reduction for each calendar day that the equipment delivery schedule is delayed. Delays resulting solely from the Town's actions will not incur cost penalties.

Review Schedule

Proposals are due at the offices of Summit Engineering Group, Inc. not later than 5:00 PM on August 18, 2020. Proposals received after that time will not be considered.

The Town plans, but does not guarantee, to review proposals and select equipment within thirty days after the closing date for receipt of proposals. All proposers will be notified of the Town's selection decision. The Town's selection will be final.

In making its selection, the Town will consider cost (including any proposed alternates), delivery schedule, equipment design and materials, anticipated maintenance/replacement or other factors deemed significant to the Town.

Additional Equipment

The Town may elect to replace aeration equipment in Aeration Basin No. 2. The proposal should indicate cost changes, if any, of providing duplicate equipment in the other basin should the Town elect this option within eight months of the date of the proposal.

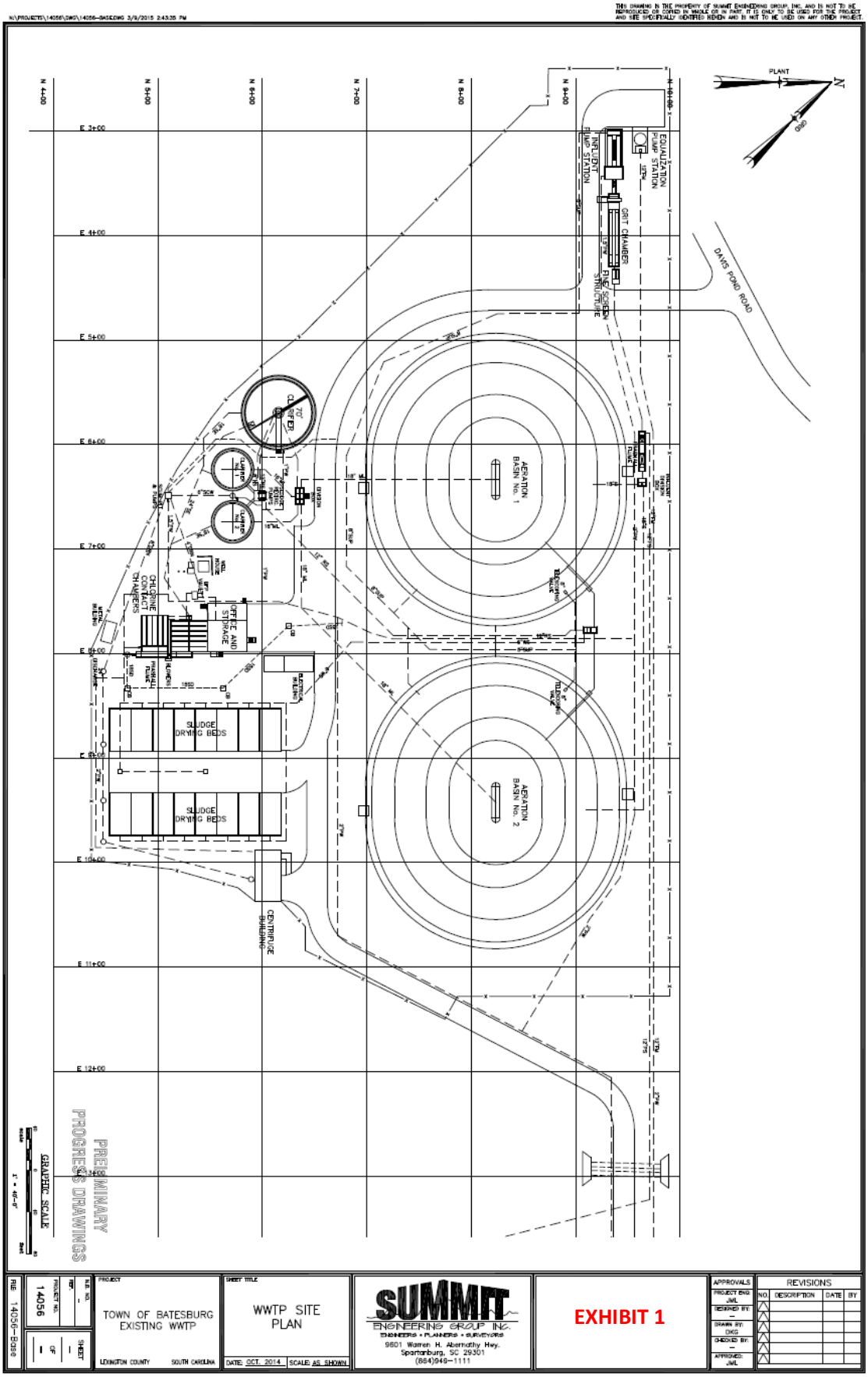

PLANT
GRID
DAVIS POND ROAD
EQUALIZATION PUMP STATION
INFLUENT PUMP STATION
GRIT CHAMBER
FINE SCREEN STRUCTURE
AERATION BASIN No. 1
AERATION BASIN No. 2
70' DIA. CLARIFIER
CHLORINE CONTACT TANKS
OFFICE AND STORAGE
SLUDGE DRYING BEDS
SLUDGE DRYING BEDS
CENTRIFUGE BUILDING
PRELIMINARY PROGRESS DRAWINGS
GRAPHIC SCALE
PROJECT
TOWN OF BATESBURG EXISTING WWTP
LEXINGTON COUNTY
SOUTH CAROLINA
SHEET TITLE
WWTP SITE PLAN
DATE: OCT. 2014
SCALE: AS SHOWN
SUMMIT ENGINEERING GROUP INC.
ENGINEERS • PLANNERS • SURVEYORS
9601 Warren H. Abernathy Hwy.
Spartanburg, SC 29301
(864)949-1111
EXHIBIT 1
APPROVALS
PROJECT ENG: JML
DESIGNED BY: -
DRAWN BY: DKG
CHECKED BY: -
APPROVED: JML
REVISIONS
NO. DESCRIPTION DATE BY
FILE: 14056-Base
PROJECT NO. 14056
SHEET 1 OF 1

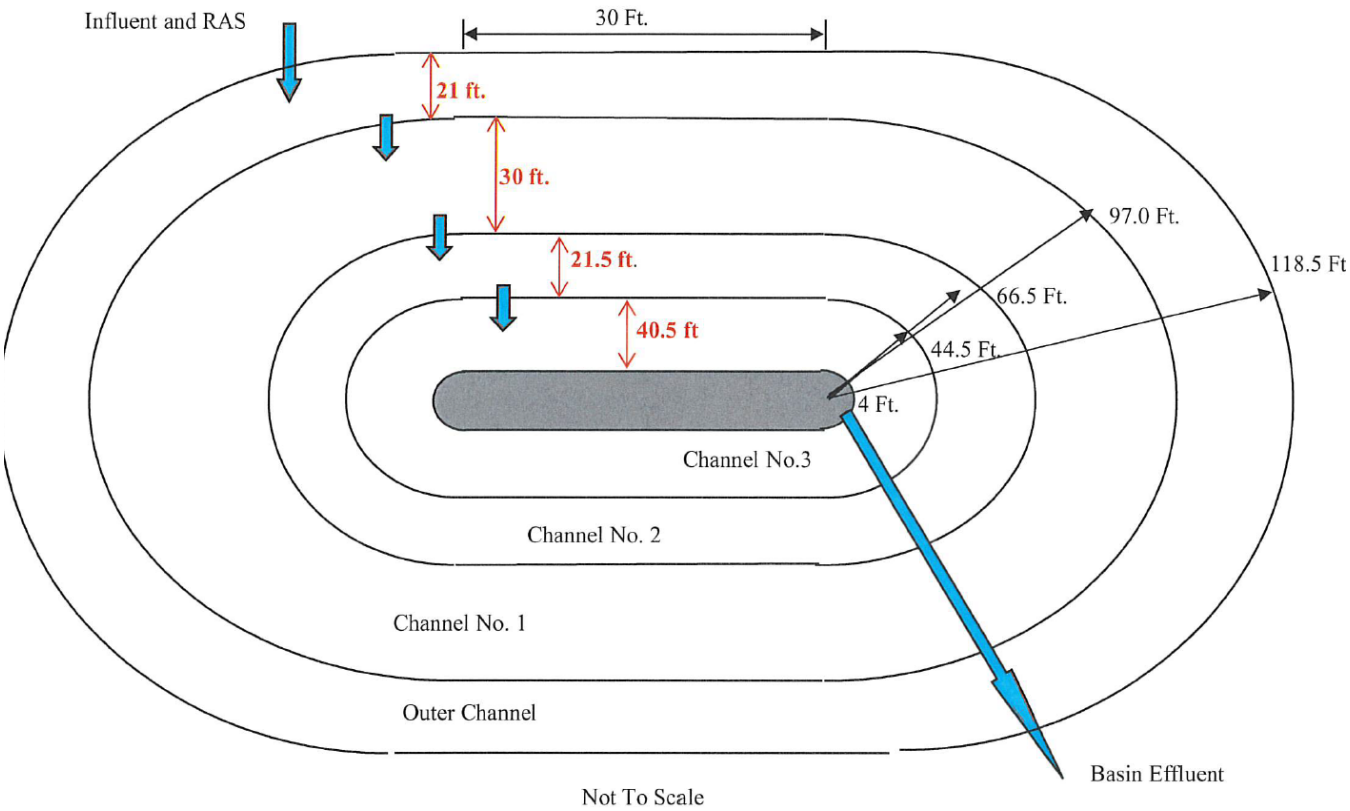
EXHIBIT 2

TOWN OF BATESBURG - LEESVILLE WASTEWATER TREATMENT PLANT

AERATOR REPLACEMENT PROJECT

Aeration Basins

Influent flow is divided and enters one of the two Aeration Basins. Four aeration channels in each basin are contained in a single reinforced concrete structure approximately 280' long and 250' wide with a 5.5 foot liquid depth. Oxygen levels in each channel can be increased or decreased by adding or removing disks for that channel. The mixed liquor moves through each channel to the outlet located in the center section of the basin. The mixed liquor is transferred from the aeration basins to the clarifiers by gravity flow.



Aeration Basin Bottom Elev. = 480.83

Channel No. 3

Floor Area $= 2 * (30 * 40.5) + \frac{(\pi * 89^2)}{4} - \frac{(\pi * 8^2)}{4}$

$= 8{,}600.9 \ ft^2$

High Water Level = 486.33

Therefore:

Channel No. 3 Depth = 486.33 - 480.83
= 5.50 ft.

Channel No. 3 Volume = Area * Depth
= 8,600.9 * 5.50 * 7.48
= 353,840 gal.

Center Line Length of Channel = $(\pi * 48.5) + (2 * 30)$
= 212.37 ft.

Channel No. 2

Floor Area = $2 * (30 * 21.5) + \frac{(\pi * 133^2)}{4} - \frac{(\pi * 90^2)}{4}$

= 8,821.2 ft^2

High Water Level = 486.33

Therefore:

Second Channel Depth = 486.33 - 480.83
= 5.50 ft.

Second Channel Volume = Area * Depth
= 8,821.2 * 5.50 * 7.48
= 362,903 gal.

Center Line Length of Channel = $(\pi * 55.75) + (2 * 30)$
= 235.14 ft.

Channel No. 1

Floor Area = $2 * (30 * 30) + \frac{(\pi * 194^2)}{4} - \frac{(\pi * 134^2)}{4}$

= 17,256.6 ft^2

High Water Level = 486.33

Therefore:

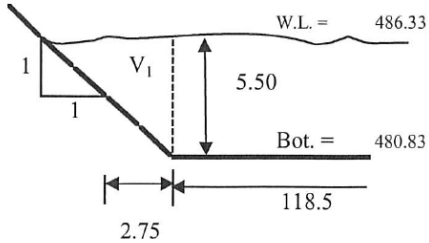
Channel No. 1 Depth = 486.33 - 480.83
= 5.50 ft.

Channel No. 1 Volume = Area * Depth
= 17,256.6 * 5.50 * 7.48
= 709,938 gal.

Center Line Length of Channel = $(\pi * 82.00) + (2 * 30)$
= 317.61 ft.

Outer Channel

High Water Level = 486.33



$V_1 = L[\,1/2\,(b\,h)\,]$

Where:

$L = \pi(\,118.5 + 2.75\,) = 380.9$ ft — For Circular Segment

$L = 2 * 30 = 60.0$ ft — For Straight Segment

Outer Channel Depth = 486.33 - 480.83
= 5.50 ft.

Note: Outer channel has a sloped outside wall

Therefore:

$$\text{Outer Channel Volume} = 2*(30*21)*5.5 + \frac{(\pi*237^2)}{4}*5.5 + (380.9 + 60.0)*\left(\frac{5.5*5.5}{2}\right) - \frac{(\pi*195^2)}{4}$$

$= 91{,}975.3\ ft^3$

$= 687{,}975.5$ gal.

Center Line Length of Channel = $(\pi*111.25) + (2*30)$
= 409.50 ft.

Table 1: Orbal Channel Volumes

Channel	Volume (gal)	Volume (MG)	Volume %	Channel Width (ft)	Centerline Length (ft)
Channel No. 3	353,840	0.354	16.73	40.5	212.37
Channel No. 2	362,903	0.363	17.16	21.5	235.14
Channel No. 1	709,938	0.710	33.57	30	317.61
Outer Channel	687,976	0.688	32.53	27.5	409.50
Total	2,114,657	2.115	100.00		

Aeration Basin Total:

Total Volume = Outer Channel + Channel No. 1 + Channel No. 2 + Channel No. 3
= 687,976 + 709,938 + 362,903 + 353,840
= 2,114,657 gal. per Basin

Volume For Two Basins = 2,114,657 * 2
= 4,229,314 gal.