



AGENDA
ENVIRONMENTAL PLANNING ADVISORY COMMITTEE

January 19, 2022

3:00 PM

Virtual Meeting

- | | | |
|----------------------|--|---------------------------|
| | 1. Welcome, Introductions, and Call to Order | Smokey Davis |
| | 2. Roll Call of Voting EPAC Members | Gregory Sprouse |
| <u>Action</u> | 3. Approval of Minutes from the January 20, 2021 Meeting (Enc.1) | Smokey Davis |
| | 4. EPAC Membership Update | Gregory Sprouse |
| <u>Action</u> | 5. 208 Plan Amendment: Eastover WWTP Expansion to 1.2 MGD (Enc.2) | |
| | a. Introduction | Gregory Sprouse |
| | b. Presentation of Proposal | Richland County Utilities |
| | c. Committee Discussion | EPAC |
| | 6. Planning Project Updates | Guillermo Espinosa |
| | a. Hazard Mitigation Plan | |
| | b. Three Rivers Watershed Based Plan | |
| | 7. Old Business/New Business/Announcements | Smokey Davis |
| | 8. Adjourn | Smokey Davis |

2022 Scheduled EPAC Meetings (3:00 PM): April 20

July 20

October 19

Called Meetings (3:00 PM): As Needed - TBD by EPAC Chair

Serving Local Governments in South Carolina's Midlands

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ENVIRONMENTAL PLANNING ADVISORY COMMITTEE

Minutes – January 20, 2021

MEMBERS PRESENT

Smokey Davis, Chair
Jason Prouse, Batesburg-Leesville
Blake Bridwell, City of Cayce
Dan Lambert (Alternate for Andy Metts)
Gwen Geidel, Citizen - at - Large
Stephen Sealy, City of Columbia
Clint Shealy, City of Columbia
Bill Stangler, Congaree Riverkeeper
Britt Poole, Town of Lexington
Jay Nicholson, Joint Municipal W&S Commission
Todd Cullum, Lexington County
Bill Davis, Richland County Utilities
John Thompson, Richland County Administration
Allen McEntire, Southeast Rural Community Assistance Program
Michelle Dickerson, West Columbia

STAFF PRESENT

Gregory Sprouse, Director of Research, Planning & Development
Guillermo Espinosa, Senior Planner

OTHERS ATTENDING

Andrew Zaengle, City of West Columbia
Joey Jaco, City of Columbia
Allen Lutz, Town of Lexington
Quinton Epps, Richland County Conservation Department
Leonardo Brown, Richland County Administrator

1. Welcome, Introduction, and Call to Order

Smokey Davis, EPAC Chair, called the meeting to order at approximately 3:05 p.m. Mr. Epps explained that because we are doing a virtual meeting we will begin with a roll call for voting members of EPAC. Gregory Sprouse with CMCOG called the roll for voting EPAC members.

2. Approval of Minutes from Last EPAC Meeting (January 20, 2021)

Mr. Davis entertained a motion to approve the minutes from the May 20, 2020 EPAC Meeting.

- ❖ A motion was made to approve the minutes from the January 20, 2021 EPAC meeting. The motion was seconded, all were in favor, and the minutes were unanimously approved.

3. Minor Plan Amendment: Town of Lexington – Watergate WWTP and Service Area

Gregory Sprouse introduced a minor 208 Plan amendment to recognize the Town of Lexington's recent acquisition of the Blue Granite - Watergate WWTP and associated service area. The amendment will acknowledge the Town's plans to eliminate the Watergate WWTP and change the 208 map to reflect the Town of Lexington as the service provider for this area. The Town of Lexington and Blue Granite Water Company reached a settlement to transfer ownership of the Watergate Wastewater Treatment Facility, which serves approximately 1,100 customers in the Old Chapin Road area of Lexington County, to the Town of Lexington. The transfer of the Watergate facility was effective December 2, 2020. The Town currently is completing an initial condition assessment of the system and is proceeding with the planning and engineering for the full incorporation of the Watergate system into the regional system and decommissioning of the Watergate plant. The current expectation is the plant will be decommissioned within approximately eighteen (18) to twenty-four (24) months. Consolidation and elimination of this WWTP is part of the long-standing regionalization plan for Lexington County and is consistent with the goals and policies of the 208 Plan.

- ❖ Jay Nicholson made a motion to recommend approval of the minor 208 plan amendment to the CMOG Board of Directors. The motion was seconded by Bill Stangler, all were in favor, and the minutes were unanimously approved.

4. 208 Regionalization Project Updates/Discussion

Gregory Sprouse facilitated a discussion with the committee on the current status of wastewater plant regionalization and consolidation efforts in the region. Britt Poole with the Town of Lexington provided an overview of the Town's progress on eliminating multiple dischargers within their designated management area. Mr. Poole showed a press release video that summarized these efforts over the last several decades. Bill Davis with Richland County Utilities provided an update on the status of the Southeast Richland Sewer project which will eliminate several small wastewater treatment facilities in southeast Richland County. Gregory Sprouse provided an update on the status of the remaining temporary wastewater treatment facilities in the region designated for elimination by the 208 plan. The committee discussed strategies for consolidating some of these facilities, including the potential for soliciting a series of engineering feasibility studies to examine alternatives and develop cost estimates. Jay Nicholson suggested reaching out to the Saluda County Water and Sewer Authority to learn about some of the projects they are working on

that may be of interest to the committee and might have some impacts within the Central Midlands Region. The committee discussed the NPDES permit map and the need for and benefits of better GIS data coordination among utility providers.

5. Three Rivers Watershed Based Plan Update/Discussion

Gregory Sprouse provided the committee with an update on the status of Three Rivers Watershed Based plan currently under development. Mr. Sprouse stated the project team is currently working on the existing conditions analysis and pollution source assessment. The team also recently held a series of focus groups and is developing a stakeholder survey and hotspot map to solicit input on potential bacteria sources in the watershed.

6. Old Business/New Business

No old or new business was discussed.

7. Adjourn

The meeting was adjourned at approximately 3:57 PM.

**MEMORANDUM**

TO: CMCOG Environmental Planning Advisory Committee

FROM: Gregory Sprouse, Director of Research, Planning, and Development

DATE: January 13, 2022

SUBJECT: Major 208 Plan Amendment: Town of Eastover WWTP Expansion

CMCOG staff will introduce a 208 plan amendment request for the expansion of the Eastover Wastewater Treatment Plant from 0.75 MGD to 1.2MGD. The Eastover facility discharges into the Wateree River and provides treatment service for Southeast Richland County and the Town of Eastover. The 208 Plan for the Central Midlands Region requires a major plan amendment for the expansion of existing WWTPs which will be expanded by at least 50% of the current design capacity. 208 Plan amendment submission requirements and a preliminary engineering report are attached for review by the committee. Representatives from Richland County Utilities will be available at the meeting to answer questions about the project. EPAC will be asked to make a recommendation to the CMCOG Board of Directors regarding this 208 plan amendment request.

Attachments:
208 Plan Amendment Submission Requirements
Preliminary Engineering Report

**RICHLAND COUNTY GOVERNMENT
UTILITIES DEPARTMENT**

7525 Broad River Road, Columbia, SC 29063
T 803-401-0050 | F 803-401-0030 | TDD 803-576-2045
rcu_service@richlandcountysc.gov | richlandcountysc.gov



January 12, 2022

Mr. Gregory Sprouse, AICP
Director of Research, Planning, and Development
Central Midlands Council of Governments
236 Stoneridge Drive
Columbia, SC 29210

Re: 208 Plan Amendment Request
Eastover WWTP

Dear Mr. Sprouse,

We would like to request a Plan Amendment to the "208 Water Quality Management Plan for the Central Midlands Region". This amendment is requested to allow Richland County Utilities (RCU) to discharge 1.2 MGD to the Wateree River from the Eastover WWTP. Several modifications will be conducted at the Eastover WWTP to support the increase in flow. Along with this letter, the CMCOG has been provided a 208 WQM Plan Amendment Request document including necessary information as called out in Section 3 Administrative Procedures of the WQM Plan. The PER and PER approval letter from SCDHEC is attached with the 208 WQM Plan Amendment Request document.

Thank you for your attention to this matter. Please do not hesitate to contact me should you have any questions or need additional information.

Sincerely,

A handwritten signature in blue ink, appearing to read "Bill Davis".

William (Bill) H. Davis, PE
Director
Richland County Government
Utilities Department

Attachment

Cc: Joseph McGougan, PE, MBD Consulting Engineers, P.A.

208 WATER QUALITY
MANAGEMENT PLAN

CENTRAL MIDLANDS REGION

PLAN AMENDMENT SUBMISSION

WATEREE RIVER BASIN

EASTOVER WWTP
RICHLAND COUNTY, SC

SUBMITTED BY:
Richland County Utilities

January 2022

PREPARED BY:



911 Norman Alley
Conway, SC 29526
MBD Project No. 320011

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SECTION 1 DETAILED DESCRIPTION AND SCOPE OF PROJECT

1.1 BACKGROUND

This 208 WQM Plan Amendment Request (this “Request”) contains the submittal by Richland County Utilities (RCU) for an amendment to the current 208 Water Quality Management Plan for the Central Midlands Region originally adopted February 27, 1997, as amended (the “208 WQM Plan”).

The existing Eastover WWTP is a 0.75 MGD rated facility and discharges to the Wateree River. This submittal will request that an increase to 1.2 MGD be allowed to discharge to the Wateree River. Several piping, pump, and chemical feed modifications will be conducted at the plant to support the increase in flow and will provide a foundation for future increases in flow.

1.2 REQUEST FOR AMENDMENT TO 208 WQM PLAN

Section 3 Administrative Procedures of the 208 WQM Plan provides guidelines for Plan Amendment Submission Requests, as well as Review Criteria for evaluating a Plan Amendment Submittal.

Proposed Amendment. This Request contains the submittal by RCU for a proposed amendment to the current 208 WQM Plan to increase the discharge of the Eastover WWTP to 1.2 MGD to the Wateree River in Richland County. This proposed amendment is referred to herein as the “*Proposed 208 Amendment.*” The estimated cost of this expansion would be \$340,000.

The Project. The proposed project will include several modifications to the plant to accommodate the increase to 1.2 MGD. These upgrades include modifying the V-notch weirs at the headworks to be 45 degrees, installing mixers in three of the four anaerobic basins, installing a mixer in Oxidation Basin #2, replacing the existing floating decanter making repairs at the digester, replacing gate valves and the effluent pipe coupling at the chlorine contact chamber, and upgrading instrumentation to ensure proper flow measurement and monitoring of effluent discharge. A coagulant will be introduced on an as needed basis to precipitate phosphorus to stay within the total loading allowed. Equipment throughout the process will also be serviced and maintained as necessary.

SECTION 2

**PRELIMINARY ENGINEERING DATA REGARDING FACILITY
DESIGN AND COST**

2.1 GENERAL

A Preliminary Engineering Report for the Project has been prepared by Joseph. W. McGougan, P.E., MBD Consulting Engineers, P.A. (“MBD”), and is attached as “Appendix A”, included as a separate document, and incorporated into this Request. Project description, location, design, and additional information is included in the PER. The PER was approved by SCDHEC on October 5, 2021. The copy of the approval letter is attached.

SECTION 3

FINANCING STRATEGY AND/OR FEASIBILITY ANALYSIS

3.1 GENERAL

RCU will be responsible for financing the proposed Project. RCU has been working to update the equipment listed in the PER. Overall cost for upgrade will be paid through O&M budget for the Eastover facility.

**SECTION 4
POTENTIAL FISCAL/ENGINEERING IMPACT ON EXISTING
FACILITIES**

4.1 GENERAL

This Project will have no fiscal or engineering impact on existing wastewater facilities, as RCU is the only authorized service provider in the area. There will be no impact to receiving streams as there was no increase in the discharge parameters listed in the NPDES permit.

SECTION 5

ASSOCIATED ENVIRONMENTAL RISKS OR IMPACTS

5.1 GENERAL

There are no known environmental risks or impacts expected from this Project. The improvements will not require any land disturbance activities. The discharge to the Wateree River will not change as there were no changes to the discharge limits.

**SECTION 6
PROJECT JUSTIFICATION OR NEED**

6.1 GENERAL

Based on data obtained from CMCOG “2050 Population Projection Report,” East Richland is projected to grow continuously and by upwards of 50% from the current population by 2050. With the population growth and improved infrastructure, industries can potentially move into this area as well. RCU will be adding customers from City of Columbia’s service area too. These potential sources of wastewater will require the Eastover WWTP to expand to 1.2 MGD. The proposed upgrade will establish a good foundation for the future expansion.

SECTION 7

SUMMARY EXAMINATION OF ALTERNATIVE OPTIONS

7.1 GENERAL

An antidegradation analysis was conducted by MBD and a detailed review of the alternatives is included in the PER, which is attached hereto. Alternatives such as conservation, reclaimed water use, land application, and discharge to other systems were considered.

SECTION 8 TIMING AND PHASING OF THE PROJECT

8.1 GENERAL

This Project is a high priority for the Eastover WWTP and RCU. Work would begin as soon as possible. This will provide Eastover with enough time to prepare for future expansion.

8.2 PROPOSED TIMING AND PHASING

Listed below is the anticipated schedule for this Project:

- Submission of the PER for upgrade approved by SCDHEC – October 2021
- Submission of the proposed 208 WQM Plan Amendment – January 2022
- Submission of Detailed Plans and Specifications for the WWTP Modification – April 2022
- Begin Modification on WWTP – August 2022
- Complete Modification and Startup of WWTP – August 2023

**APPENDIX A
PRELIMINARY ENGINEERING REPORT**

Attached as a separate document

EASTOVER WWTP EXPANSION TO
1.2 MGD
PRELIMINARY ENGINEERING REPORT

Prepared for
Richland County

March 2021



MBD Project No. 320011



911 Norman Alley
Conway, SC 29526

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Appendix

- Appendix A – Design Calculations
- Appendix B – Wasteload Allocation

SECTION 1 GENERAL INFORMATION

1.1 INTRODUCTION

This Preliminary Engineering Report addresses the improvements proposed for the expansion of the Eastover WWTP including an expansion of the capacity and required upgrades to handle the increased flow.

1.2 PROJECT DESCRIPTION

The Eastover WWTP Upgrade project will include the upgrade in the capacity of the Eastover WWTP from 0.75 MGD to 1.2 MGD along with repairs and additions to existing systems. A brief description of each project is listed below:

- The screen spray system will be repaired, and the influent V-notch weir used for flow measurement will be increased from 22.5 degrees to 45 degrees.
- Mixers will be installed on 3 of the 4 anaerobic basins with a Davits crane on each mixer, along with a mixer guide rail on basin 1. A mixer will also be installed in Oxidation Basin 2. The automatic control system will be repaired on the oxidation ditches.
- The floating decanter in the digester will be repaired.
- The effluent pump will be placed into service and the discharge pipe coupling will be replaced.
- A permanent refrigerated sampler will be installed at the headworks and upgraded instrumentation will be installed to ensure proper measurement of flow and effluent discharge.
- An evaluation of the existing equipment performance will be reviewed prior to increasing the flow.

A detailed description of the upgrades and improvements are included in Section 4.

1.3 QUALIFICATIONS

This report was prepared by MBD Consulting Engineers, P.A. MBD reserves the right to review any additional data or supplemental comments regarding the contents of this document and revise the document accordingly.

SECTION 2 EXISTING WASTEWATER TREATMENT FACILITY

2.1 GENERAL

The existing Eastover WWTP is a 0.75 MGD rated facility and discharges to the Wateree River. This report demonstrates the ability to increase the flow capacity of the facility to 1.2 MGD and set the foundation for possible further expansion of the facility.

Listed below is a description of the existing processes at the WWTP.

2.2 EXISTING WWTP DESCRIPTION

Included below is a description of individual process at the existing Eastover Wastewater Treatment facility.

2.2.1 Headworks

The existing headworks is an elevated structure to which all the influent flow is pumped from offsite pump stations. The headworks includes an automatic debris screen and a manual bypass screen. The automatic screen is a sloped punch plate screen with brush and auger to remove debris from the influent flow train. The headworks does not include grit removal. Flow from the headworks is discharged into a chamber of the headworks where excessive flows can be bypassed. Flow from the headworks is divided via two weirs into an effluent box that discharges into the anoxic zone of the oxidation ditch system. The influent V-notch weirs are at 22.5 degrees.

2.2.2 Oxidation Ditches

The oxidation ditch design includes two racetrack style oxidation ditches, each with a dedicated anoxic zone. Discharge from the headworks and the returned sludge from the clarifiers is introduced into the anoxic zone. Each anoxic zone includes two mixers. The oxidation ditch includes two openings that allow a portion of the oxidation ditch flows to pass through the anoxic basin.

Each oxidation ditch includes a vertical type mixer. The two basins utilize a common wall construction and the discharge weir for the two basins are located on the end of the basin opposite from the anoxic zone. Manual adjustable weirs are used to collect discharge from the oxidation basins into the clarification units.

2.2.3 Clarifiers

The existing treatment process includes two sloped bottom clarifiers. The two clarifiers have a combined surface area of 3,926 SF. The existing basins include sludge draw off piping that is divided into RAS return to the anoxic zone of the oxidation ditch and a WAS discharge to the digester located adjacent to the oxidation ditches.

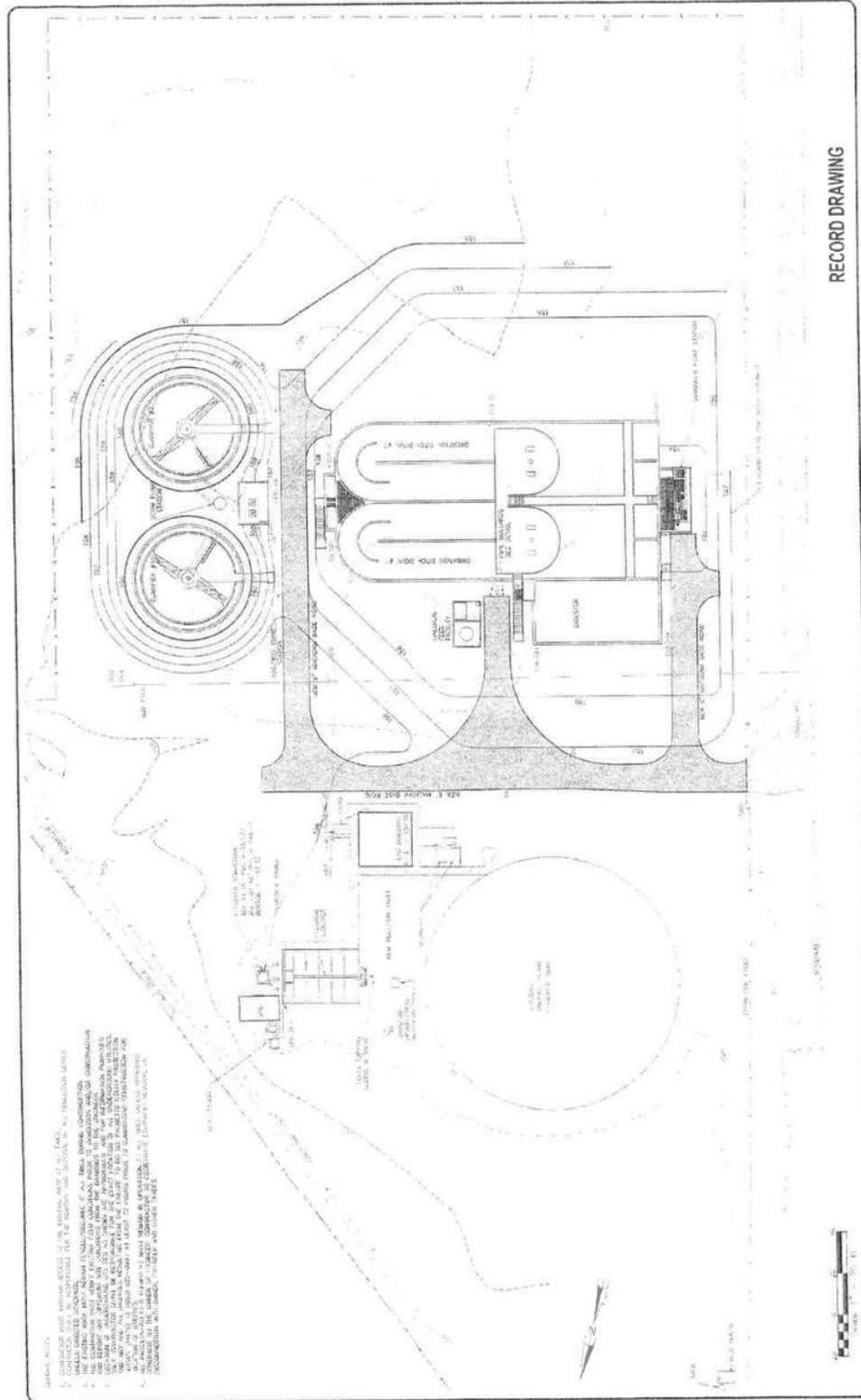
2.2.4 Digester

The existing digester has a maximum volume of 161,568 gallons. The digester has a floating decanter to provide thickening. The decanter is in disrepair with a leak in the draw off hose. The digester also has fine bubble diffusion located on the bottom of the basin for aeration and mixing.

2.2.5 Chlorine Contact

Flow from the two clarifiers enter the two-stage chlorine contact chamber for disinfection to take place. Sodium Bisulfate is used to dechlorinate the water. Treated flow is released over an effluent weir and then discharged through the effluent pipe to the Wateree River.

EASTOVER WWTP EXPANSION TO 1.2 MGD
 PRELIMINARY ENGINEERING REPORT
 MARCH 2021



GENERAL NOTES:
 1. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND ELEVATIONS SHOWN ON THIS DRAWING.
 2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL, STATE, AND FEDERAL AGENCIES.
 3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL, STATE, AND FEDERAL AGENCIES.
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RECORD DRAWING



Lower Eastern Wastewater Treatment Facility Replacement
 PROJECT NUMBER
Richland County
 Richland County, South Carolina
 Planning, Construction and Improvement Services, Inc.

AMERICAN ENGINEERING CONSULTANTS, INC.
 1100 LINDEN STREET • P.O. BOX 2208 • COLUMBIA, SC 29202
 (803) 732-1000 • FAX (803) 732-1001
 www.aec.com



AMERICAN ENGINEERING CONSULTANTS, INC.
 1100 LINDEN STREET • P.O. BOX 2208 • COLUMBIA, SC 29202
 (803) 732-1000 • FAX (803) 732-1001
 www.aec.com

NO.	REVISION	DATE

SECTION 3 ANTIDegradation EVALUATION

3.1 GENERAL

In accordance with Regulation 61-68, entitled “Water Classifications and Standards,” proposed or expanding discharges to “high quality” surface water can only be permitted if the Department finds, after intergovernmental coordination and public participation, that allowing lower water quality is necessary to important economic and social development in the areas where the waters are located. “High Quality” waters are those water whose quality exceeds levels necessary to support propagation of fish, shellfish, and wildlife, and recreation in and on the water. The Wateree River qualifies for this designation.

The proposed increase to 1.2 MGD does not propose to “lower water quality” as the total UOD discharged to the Wateree River will not exceed the amount permitted.

Information included below provides the antidegradation review for the discharge from the Eastover WWTP to the Wateree River.

3.2 ANTIDegradation ANALYSIS

The antidegradation analysis will review the increase in any permitted pollutant loading, the discharge of a pollutant not currently discharged or any increase in the mass of a pollutant. This analysis will include a review of the domestic service area, the waste load allocation, and reasonable alternatives for the discharge to the Wateree River.

3.2.1 Service Area

The service area has been presented in previous studies and reviews with DHEC. In addition to the existing service area, an estimated 1200 new REUs along with portions of the Hopkins and Columbia area will be served by the WWTP upgrade and discharge to the Wateree River.

3.2.2 Waste Load Allocation

A waste load allocation was performed on the discharge to the Wateree River at a volume of 0.75 MGD. The waste load allocation established a UOD loading for the Wateree River, as well as other constituents. The total waste load allocation for the Wateree River will not be increased based on the increase in discharge from 0.75 MGD to 1.2 MGD. The treatment process will be capable of meeting current waste load allocation including the UOD provided in the draft NPDES permit allowing for a 1.2 MGD discharge to the Wateree River. Appendix B includes the WLA provided by SCDHEC.

3.2.3 Reasonable Alternatives

The antidegradation analysis must review technologically feasible alternatives that are available for reducing or eliminating discharge to the surface water. These items include conservation, the use of reclaimed water, land application, and discharge to other treatment systems. Each of these items will be discussed below.

3.2.3.1 Conservation

Current building codes in the Richland County area presently require low flow devices, which is the primary component of conservation systems in residential use and discharge of wastewater. In addition, the design and manufacturer of household appliances have improved the efficiency in

conservation of water. RCU does not have the ordinance authority over the service area; however, the current building codes and ordinances for Richland County addresses the need and ongoing utilization of conservation activities within residential construction.

3.2.3.2 Reclaimed Water Use

At the current time, there were no industrial clients available that could utilize the effluent from the treatment plant. Effluent can also be made available for any reuse systems such as irrigation in the future.

3.2.3.3 Land Application

The option of buying land and setting up the necessary processes to discharge the effluent was evaluated and determined to be cost prohibitive. The cost of land in the area is expensive and overall availability of applicable land would be hard to find. If land could be found for a reasonable price, the cost associated with setting up infiltration basins along with monitoring wells exceeds the benefits.

3.2.3.4 Discharge to Other Systems

Portions of the Columbia and Hopkins service area is being transferred to this plant via prior SCDHEC permits and has been agreed upon by all parties. There are no available discharge options for the additional flow that would not be cost prohibitive.

3.3 SUMMARY

The County has utilized environmentally beneficial methods of disposal of treated wastewater since its beginning and will continue to pursue methods of disposal that reduce the discharge to surface water streams. In the meantime, the discharge to the Wateree River will reduce contaminant loading to the maximum extent possible at a minimum meeting the UOD requirements as specified in the NPDES discharge permit.

SECTION 4 NUTRIENT EVALUATION

4.1 GENERAL

The Eastover WWTP has a phosphorus limit that requires advanced treatment. Information was requested from DHEC and the total loading for phosphorus allowed in the effluent from the WWTP is 8.23 lbs./day. Based on a plant capacity of 1.2 MGD, the phosphorus performance goal would be 0.82 mg/L. Meeting this phosphorus goal will require the addition of a coagulant to precipitate the phosphorus. It will also be a concern for the removal and wasting of sludge and the return of any decant of the sludge basins, not to enhance the phosphorus loading on the plant.

4.2 NUTRIENT EVALUATION

The nutrient evaluation will review the increase in any nutrient loading, specifically phosphorus, at the plant. This will include the waste load allocation and reasonable alternatives for the phosphorus concern.

A report was prepared by Joel E. Wood & Associates for Mr. Bill Davis, P.E., Director of Richland County Utilities in September 2020 that reviewed the phosphorus loading options. Assistance was provided for this evaluation by Jeff deBessonnet with WEC.

4.2.1 Waste Load Allocation

A waste load allocation was performed on the discharge to the Wateree River at a volume of 0.75 MGD. The parameter of most concern is phosphorous. SCDHEC maintained the 7.09 lbs/day loading cap with the proposed expansion, however they also calculated an additional 1.14 lbs/day due to closing smaller plants in the Hopkins area. This makes the new loading cap 8.23 lbs/day. Appendix B includes the WLA provided by SCDHEC.

4.2.2 Reasonable Alternatives

Below are reasonable alternatives to resolve the phosphorus concern. These alternatives include sharing the load with the County's Broad River plant, sharing the load with other surrounding plants, pursue additional allocation from individual permittees, reallocation request via the Central Midlands COG, and/or find a phosphorus offset via negotiation with other phosphorus sources.

4.2.2.1 Sharing Load with the County's Broad River Plant

The County could create flexibility in the combined loading already allocated. 69 lbs/day along with 8.23 lbs/day allows for a total of 77.23 lbs/day. If the Eastover plant discharges more than 8.23 lbs/day, but the combination with the Broad River discharge is under 77.23 lbs/day, Eastover would be in compliance with their NPDES permit.

4.2.2.2 Sharing Load with Other Plants

This would involve creating interest in another utility in the Congaree or Wateree watershed to have greater flexibility. If a neighboring facility saw the value of in the Lower Richland area growing, they may want to create flexibility.

4.2.2.3 Pursue Additional Allocation for Individual Permittees

Since the County is taking an estimated 0.577 MGD from Columbia's system, request that the City transfer an equivalent amount of phosphorus loading. Negotiate a loading swap with another

facility that does not need the loading. The County may have other ways to help a permittee outside its wastewater program.

4.2.2.4 Reallocation Request via the Central Midlands COG

Since SCDHEC started setting in place a phosphorus cap based on the size of each treatment facility, the caps have taken place over a long period of time and do not reflect growth patterns and needs in the Midlands area. The COG is the venue to ask for a reallocation of loading to balance the economic impact across the region. This could be a complicated process because there would be winners and losers as you reallocate. For the COG to embrace this, which could be resource intensive, they would likely want to see the critical problem the County is facing. This is likely a long-term process. However, the County needs to be concerned with getting stuck with tight limits for the next many years with no certainty of relief.

4.2.2.5 Find a Phosphorus Offset via Negotiation with Other Phosphorus Sources

This can be a broad and complicated process but long-term, may be cost effective. MS4 programs or traditional non-point sources may implement best management practices that could reduce phosphorus loading in the Congaree/Wateree watershed. However, unlike the known wastewater discharges, regulated via permits, finding an offset is not a simple matter. It would likely involve water quality modeling as a predictive tool and a conservative loading cut estimate to be considered. Whether working with the agricultural community or the County's MS4 program, negotiating stormwater related cuts may produce value for Eastover and the Broad River plants.

4.3 SUMMARY

The treatment plant can reduce phosphorus to the 0.82 mg/L level with the use of a coagulant provided the sludge wasting and sludge digesting processes are closely monitored to reduce the return of phosphorus to the headworks of the treatment plant in the decanting operation from the digester. Also, of a concern is the methodology for the dewatering and disposing of the digested sludge. Land application of the liquid sludge would be preferred at this rate in order to reduce the possibility of dewatering onsite and returning decant with high phosphorus loading to the headworks of the treatment plant.

SECTION 5

PROPOSED WASTEWATER TREATMENT FACILITY EXPANSION

5.1 GENERAL

The treatment plant is being expanded to a capacity of 1.2 MGD. Appendix A provides the design calculations using the proposed increased flow. The description below will indicate the improvements required to increase the capacity.

5.2 PROPOSED WASTEWATER TREATMENT EXPANSION

5.2.1 Headworks

In order to process 1.2 MGD, the existing 22.5 degree V-notch weirs will be replaced with 45 degree V-notch weirs.

5.2.2 Anaerobic Basins and Oxidation Ditches

Before increased flow is introduced, all mixing and aeration equipment will be serviced by the manufacturer to ensure the equipment is operating at required performance levels. A mixer guide rail will be installed on Anaerobic Basin #1 and mixers will be installed on three of the four anaerobic basins. A mixer will also be installed in Oxidation Basin #2. A Davits Crane will be installed with each mixer. The automatic dissolved oxygen control system in the oxidation ditches will be replaced.

The overall detention time in the oxidation and anoxic zones is 22 hours based on the increased flow of 1.2 MGD. The design capacity is adequate for the treatment limits proposed in the current NPDES permit. Supplemental aeration may be required to maintain DO levels within the basin based on the design and location of the existing vertical aeration system.

5.2.3 Clarifiers and Digester

The existing clarifier equipment should be evaluated by the manufacturer prior to introduction of additional flow. Maintenance such as painting should be performed prior to expanding capacity. The existing clarifiers have a combined surface area of 3,926 SF. Using a design flow of 1.2 MGD, the loading rate is 305 GPD/SF.

The floating decanter in the digester is in disrepair with a leak in the draw off hose. The decanter pump will also need to be repaired as it has a crack in the volute of the pump. The existing digester has a maximum volume of 161,568 gallons. The wasting rate at 1.2 MGD would be approximately 39,500 GPD at a concentration of 8,000 mg/L. Thickening the sludge to a concentration of 2% would reduce the sludge volume to provide approximately 10 days of digester storage available. With plant capacity at 1.2 MGD, additional digester storage may be required. For the short-term, pumping and hauling of waste will be conducted.

5.2.4 Chlorine Contact System

The gate valves at the head of each chamber will be replaced as well as the effluent pump pipe coupling. Based on information provided by the surveyor, the existing chlorine contact basin has adequate capacity for 1.2 MGD. The basin also has redundant chambers for maintenance.

5.2.5 Instrumentation and Testing

The existing instrumentation should be upgraded at this time to ensure proper flow measurement through the treatment process, including return and waste sludge and to monitor the effluent discharge from the treatment plant. A permanent refrigerated sampler needs to be installed too. By increasing the flow above 1 MGD, the new NPDES permit will require a core mix analysis and toxicity testing.

5.2.6 Nutrient Loading

The treatment plant can reduce phosphorus to the 0.82 mg/L level with the use of a coagulant provided the sludge wasting and sludge digesting processes are closely monitored to reduce the return of phosphorus to the headworks of the treatment plant in the decanting operation from the digester. This coagulant will be used only on a needed basis. Also, of a concern is the methodology for the dewatering and disposing of the digested sludge. Land application of the liquid sludge would be preferred at this rate in order to reduce the possibility of dewatering onsite and returning decant with high phosphorus loading to the headworks of the treatment plant. The phosphorus concentration limit, currently set at 1.13 mg/L, is expected to be set at 2 mg/L, consistent with other facilities, to provide flexibility.

APPENDIX A
DESIGN CALCULATIONS

EASTOVER WWTP EXPANSION TO 1.2 MGD
 PRELIMINARY ENGINEERING REPORT
 MARCH 2021

Project: **Lower Richland (Eastover) WWTP**
 MBD No.: 320011

29-Oct-20
 Directory: C:\Users\spollard\OneDrive - MBD Consulting Engineers\Documents\

Reference: "Wastewater Engineering Treatment, Disposal, and Reuse" Metcalf and Eddy, Inc.

LEGEND

0.00 = data that is input into spreadsheet

0.00 = values calculated by spreadsheet

NARRATIVE

WASTEWATER FLOWS and DESIGN CONDITIONS

		<u>Influent</u>	<u>Effluent</u>
Peak Flow	3,000 mgd		
Design Flow	1.20 mgd		
Start-up Flow	0.80 mgd		
BOD(5)		200 mg/l	5 mg/l
TSS		200 mg/l	5 mg/l
TKN		40 mg/l	
NH ₃ -N			1 mg/l
Max. Temp.	27 deg. C		
Site Elevation	160		
Temperature Correction q	1.024		
Saturation D.O. @ Temp., Elev. Cst.	7.99 mg/l		

DESIGN ASSUMPTIONS

MLSS	3,000 mg/l
Start-up MLSS	3,000 mg/l
RAS / WAS Conc.	5,000 mg/l
a Transfer Alpha Value	0.70
b Transfer Beta Value	1.00
MCRT	15 days
C _w - Operating oxygen concentration in ww	2.00 mg/l
C _s - oxygen saturation tap water @ field conditions	9.07 mg/l
C _{s20} - oxygen saturation tap water @ 20 C	10.78
T _w - wastewater temperature max	27.00 C
lb BOD(5)/1,000cf Aeration Vol.	15
Sludge Yield (lb TSS/lb BOD ₅ destroyed)	0.65
Volatile SS Fraction (MLVSS/MLSS)	0.8

EASTOVER WWTP EXPANSION TO 1.2 MGD
 PRELIMINARY ENGINEERING REPORT
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RATE COEFFICIENTS

lb Oxygen/lb BOD(5) applied	1.30
lb Oxygen/lb NH ₃ -N applied	4.60

HP COEFFICIENTS

lb O ₂ /BHP-Hr.	3.00	7.8
BHP/ 1,000 CF	0.50	1.5

FORMULAS

Sludge Age (days)	=	$\frac{\text{Suspended Solids in Aeration}}{\text{Suspended Solids to Aeration}}$
<i>(Formulas, cont.)</i>		
MLSS (mg/l)	=	$\frac{\text{Desired Suspended Solids in Aeration}}{\text{Weight of Water in Aeration}}$
MCRT (days)	=	$\frac{\text{Suspended Solids in Aeration}}{\text{SS in WAS} + \text{SS in Effluent}}$
Food to Microorganism Ratio	=	$\frac{\text{BOD to Aeration}}{\text{MLVSS in Aeration}}$

EASTOVER WWTP EXPANSION TO 1.2 MGD
 PRELIMINARY ENGINEERING REPORT
 MARCH 2021

AERATION BASIN SIZING

CALCULATED PARAMETERS

1. BOD (5) Destroyed	=	MGD x (8.34 lb/gal.) (Influent BOD (mg/l) - Effluent BOD (mg/l))
@ Peak Flow	=	4,878.90 lb./day
@ Design Flow	=	1,951.56 lb./day
@ Start-up Flow	=	1,301.04 lb./day
2. NH ₃ -N Destroyed	=	MGD x (8.34 lb/gal.) (Influent TKN (mg/l) - Effluent NH ₃ -N (mg/l))
@ Peak Flow	=	975.78 lb./day
@ Design Flow	=	390.31 lb./day
@ Start-up Flow	=	260.21 lb./day
3. Actual O ₂ Transfer Rate	=	(1.50 x BOD(d)) + (4.60 x NH ₃ -N(d))
@ Peak Flow	=	10,831.16 lb./day
@ Design Flow	=	4,332.46 lb./day
@ Start-up Flow	=	2,888.31 lb./day
4. Standard O ₂ Transfer Rate =		$\frac{\text{AOTR}}{\text{Alpha} \times \frac{(\text{Transfer Beta} \times \text{C}(\text{st}) - \text{Co})}{\text{C}(20)} \times \text{Theta}}$ (Tw - 20)
@ Peak Flow	=	19,983.73 lb./day
@ Design Flow	=	7,993.49 lb./day
@ Start-up Flow	=	5,328.99 lb./day
5. Aeration Volume (@ 15.6 lb. BOD(5) / 1,000 cf)	=	BOD(d)*(1,000 cf / 15 lb BOD(d))*(7.48 gal./cf)
@ Peak Flow	=	2,432,945 gal.
@ Design Flow	=	973,178 gal.
@ Start-up Flow	=	648,785 gal.
Detention Time	=	Aeration Volume / Design Flow x (24 hrs. / day)
@ Design Flow	=	19.46 hrs.
6. System Mass	=	BOD(d) x MCRT x (lb TSS / lb BOD(d))
	=	19,028 lb.
7. Aeration Volume @ System Mass =		$\frac{\text{System Mass} / (8.34 \text{ lb. / gal.})}{\text{MLSS}}$
	=	760,500 gal.
Detention Time	=	Aeration Volume / Design Flow x (24 hrs. / day)
@ Design Flow	=	15.21 hrs.

EASTOVER WWTP EXPANSION TO 1.2 MGD
 PRELIMINARY ENGINEERING REPORT
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SELECTED REACTOR BASIN VOLUME -		=	1,017,500 gal.
	Detention Time	=	Aeration Volume / Design Flow x (24 hrs. / day)
@	Design Flow	=	20.35 hrs.
8.	Horsepower Required	=	SOTR / (lb O ₂ / BHP-hr) / 24 hrs.
@	Design Flow	=	111.02 hp
9.	Food / Mass Ratio	=	BOD(d) / (MLSS x 0.65 x (8.34 lb. / gal.) x Aeration Volume)
@	Design Flow	=	0.12
10.	WAS Rate	=	$\frac{\text{SS in Aeration} - \text{Effluent SS}}{\text{WAS conc.} \times \text{MCRT}}$
=		=	$\frac{(\text{Aer. Vol.} \times \text{MLSS conc.} \times (8.34 \text{ lb./gal.})) - (\text{WW Flow} \times \text{Effluent SS conc.} \times (8.34 \text{ lb./gal.}) \times \text{MCRT})}{\text{WAS conc.} \times (8.34 \text{ lb./gal.}) \times \text{MCRT}}$
@	Design Flow	=	39,500 gal./day
@	Start-up Flow	=	39,900 gal./day

EASTOVER WWTP EXPANSION TO 1.2 MGD
 PRELIMINARY ENGINEERING REPORT
 MARCH 2021

CLARIFIER EVALUATION

DESIGN ASSUMPTIONS

Design Sludge Return Rate
 Design Flow MLSS
 # of Units
 Sidewater Depth
 Design Surface Loading Rate
 Design Solids Loading Rate
 Design Weir Overflow Rate
 Design Detention Time

	Design Flow	Peak
	2.4 mgd	
	3,000 mg/l	
	2	
	12 ft.	
	350 gpd/sf	
	30 lb/day/sf	50 lb/day/sf
	12,500 gpd/lf	
	4 hrs.	

CALCULATED PARAMETERS

1. Diameter Required

a. Surface Loading Basis:

$$\begin{aligned} \text{Area} &= \text{Design Flow} / \text{Surface Loading Rate} / 2 \text{ units} \\ &= 3428.57 \text{ sf} \\ \text{Dia.} &= \text{Square root of } ((\text{Area} / \text{Pi}) \times 4) \\ &= \boxed{66.07} \text{ ft.} \end{aligned}$$

b. Solids Loading Basis:

$$\begin{aligned} \text{Area} &= (\text{Design Flow} \times \text{MLSS} \times (8.34 \text{ lb./gal.})) / (30 \text{ lb./day/sf}) / 2 \text{ units} \\ &= 1,000.80 \text{ sf} \\ \text{Dia.} &= \text{Square root of } ((\text{Area} / \text{Pi}) \times 4) \\ &= \boxed{35.70} \text{ ft.} \end{aligned}$$

c. Weir Overflow Basis

$$\begin{aligned} \text{Weir Length} &= \text{Design Flow} / \text{Weir Overflow Rate} / 2 \text{ units} \\ &= 96 \text{ ft.} \\ \text{Dia.} &= \text{Weir Length} / \text{Pi} \\ &= \boxed{30.56} \text{ ft.} \end{aligned}$$

d. Detention Time Basis

$$\begin{aligned} \text{Area} &= \frac{\text{Design Flow} \times \text{Detention Time}}{(7.48 \text{ gal./cf}) \times \text{SWD} \times 2 \text{ units}} \\ &= 2228.16 \\ \text{Dia.} &= \text{Square root of } ((\text{Area} / \text{Pi}) \times 4) \\ &= \boxed{26.63} \end{aligned}$$

EASTOVER WWTP EXPANSION TO 1.2 MGD
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SELECTED CLARIFIER DIAMETER -		=	50.00 ft.	
2. Surface Loading Rates				
		=	Flow / Area / # Units	
@	Peak Flow	=	763.94 gpd/sf	1527.887
@	Design Flow	=	305.58 gpd/sf	611.155
@	Start-up Flow	=	203.72 gpd/sf	407.4367
3. Solids Loading Rates				
		=	(Flow x MLSS x (8.34 lb./gal.)) / Area / Units	
@	Peak Flow	=	19.11 lb/day/sf	38.22774
@	Design Flow + RAS	=	22.94 lb/day/sf	45.87329
@	Start-up Flow + RAS	=	20.39 lb/day/sf	40.77626
4. Weir Overflow Rate				
		=	Flow / Weir Length / # Units	
@	Peak Flow	=	9549.30 gpd/lf	19098.59
@	Design Flow	=	3819.72 gpd/lf	7639.437
@	Start-up Flow	=	2546.48 gpd/lf	5092.958
5. Detention Time				
		=	$\frac{\text{Area} \times \text{SWD} \times (7.48 \text{ gal./cf}) \times (24 \text{ hrs./day}) \times \# \text{ Units}}{\text{Flow (gpd)}}$	
@	Peak Flow	=	2.82 hrs.	
@	Design Flow	=	7.05 hrs.	
@	Start-up Flow	=	10.57 hrs.	

APPENDIX B
WASTELOAD ALLOCATION

EASTOVER WWTP EXPANSION TO 1.2 MGD
 PRELIMINARY ENGINEERING REPORT
 MARCH 2021



September 2, 2020

Joel E. Wood, P.E.
 Joel E Wood & Associates, LLC
 2160 Hilbert Highway
 York, SC 29745

RE: Wasteload Allocation
 Proposed Richland County/Eastover WWTP's Expansion
 NPDES Permit No. SC0047911
 Richland, SC

Dear Mr. Wood:

At your request, preliminary wasteload allocations have been obtained for Richland County/Eastover's proposed 1.2 MGD and 2.5 MGD discharge to the Wateree River at facility's existing outfall location.

The following NPDES permit limits may 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):

Commented [ms1]: Enter the flow for which the WLA is developed.

Parameters	Existing Discharge	Proposed Limits <u>without</u> existing Town of Ridgeway Discharge	
Flow, MGD	0.75	1.2	2.5
BOD ₅ , mg/l	30	30	10
TSS, mg/l	30	30	30
NH ₃ -N, mg/l	20	20	2.0
TRC, mg/l	0.5/1.0	0.5/1.0	0.5/1.0
Dissolved Oxygen, mg/l	2.0 ¹	2.0 ¹	2.0 ¹
E. Coli. /100ml	126/349	126/349	126/349
UOD, lbs/d - Critical	853.2 ²	---	---
Total Nitrogen	MR	MR	MR
Total Phosphorus	1.13 mg/l (7.09 lbs/d)	8.23 lbs/d	8.23 lbs/d
Total Phosphorus – Monthly Loading	To be determined ³	To be determined ³	To be determined ³
Total Phosphorus – Annual Loading	To be determined ³	To be determined ³	To be determined ³
Whole Effluent Toxicity Chronic Test	CTC = 2.8% ⁴	CTC = 100% ⁴	CTC = 100% ⁴
Pollutants in Part D, Form 2A "Expanded Effluent Testing Data"	---	Testing Data needs to be submitted with NPDES application ⁵	Testing Data needs to be submitted with NPDES application ⁵

¹ Minimum at all times.

² See note in the WLA

³ See note in the WLA

⁴ Toxicity test concentrations can be changed subject to a Mixing Zone Evaluation.

⁵ Reasonable potential has yet been evaluated since sampling data is not available for these future Discharge.

EASTOVER WWTP EXPANSION TO 1.2 MGD
PRELIMINARY ENGINEERING REPORT
MARCH 2021

The following conditions should be noted. The wasteload is informational 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 expansions 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.
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.

If you have any questions, please do not hesitate to call me at (803) 898-4228 or at greenba@dhec.sc.gov or Weijia Hu at (803) 898-4256 or at huw@dhec.sc.gov

Sincerely,



Brenda Green, Manager
Domestic Wastewater Permitting Section
Bureau of Water

cc: Veronica Barringer, EA Central Midlands Region – BEHS Columbia
Shawn M Clarke, Director, Water Facilities Permitting Division
Wade Cantrell, Water Quality Modeling Section
Susan Waldner, Water Quality Modeling Section
Weijia Hu, Domestic Wastewater Permitting Section (w/original attachment)



BUREAU OF WATER

October 5, 2021

Joseph McGougan, P.A.
MBD Consulting Engineers
911 Norman Alley
Conway, SC 29526

RE: PER APPROVAL LETTER: LOA-005991
RICHLAND CO EASTOVER REG WWTP/Eastover WWTP Expansion to 1.2 PER
NPDES PERMIT NO. SC0047911
RICHLAND COUNTY

Dear Joseph McGougan:

This Department has completed the review of the above referenced Preliminary Engineering Report (PER) that was submitted on April 29, 2021, to expand the Richland Co/Eastover Reg WWTP from 0.75 MGD to 1.20 MGD. The Department hereby conceptually approves the PER.

This Preliminary Engineering Report (PER) approval is valid for six (6) months from the date of this letter. Plans and specifications consistent with the approved PER must be submitted during this period. Approval of the PER does not guarantee that a SCDHEC Construction Permit will be issued for the project. This approval does not affect, modify, or extend any existing Schedule of Compliance or Enforcement Schedule, which may be in effect. This Agency reserves the right to re-evaluate and/or require modifications to any approved PER after this six (6) month period.

This PER approval is valid from the effective date **October 5, 2021** to the expiration date **March 7, 2021**. Any request for an extension shall be submitted through ePermitting 15 days prior to the expiration date and approved by the Department. Justification of the need for the extension shall be included with the request.

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

Sincerely,

A handwritten signature in blue ink, appearing to read "Tyra N. Foulks", is written over a horizontal line.

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

Attachments: Wasteload Allocation Worksheet

cc: Brenda A. Green, Manager, BOW
Shawn M. Clarke, Director, Water Facilities Permitting Division
Wiejia Hu, Domestic Wastewater permitting section
Wade Cantrell, 303d Modeling TMDL Section Manager, BOW
Susan Waldner, Water Quality Modeling Section
Steven M. Pollard, MB Consulting Engineers, P.A.
BOW/WPC Enforcement

1.0 mgd prop

S.C. DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL
BUREAU OF WATER
DIVISION OF WATER QUALITY
WATER QUALITY MODELING SECTION

WASTELOAD ALLOCATION WORKSHEET AND COORDINATION FORM

Date: 6/24/2020 Engineer: Weijia Hu WLA Type: Proposal
Discharger: Richland Co/Eastover Regional WWTP NPDES: SC0047911
County: Richland WMU: 0301 HUC: 03050104-04
Receiving waters: Wateree River On 303(d) list? yes

I. Water Quality Modeling Section

A. Model Data:

Model used: Qual2e
Name: LWAT1.IN
USGS station / site: 02148000, 02148315
Unit 7Q10 (cfs/mi²): ---
Stream critical flow (cfs): 1201* Critical flow type: 7Q10
Avg. annual flow (cfs): 5932**
Drainage area (mi²): 5590
Stream Q: waste Q ratio: 1:0.001546
Temp critical (F/C): 84.7/29.28***
Temp seasonal (F/C): 58.3/14.61***
Velocity (ft/s): 0.75 - 1.45
Slope (ft/mi): ---
K1 (d⁻¹): 0.06
K2 (d⁻¹): 0.14 - 2.18
K3 (d⁻¹): 0.1
F ratio: 1.78:1 (weighted average, some industrial effluent expected)
Stream characteristics: *critical flow is the difference between 7Q10 at USGS 02148315 and 02148000 plus FERC flow from dam [(975cfs - 574cfs) + 800]
** AAQ from USGS 02148000, ***temps from model (reach 9, element 1).

B. Model Input Sources

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

Describe field data: USGS 02148000, 02148315, CW-206, CW-222, C-007

C. Model Validity:

Intensive survey? yes

Calibrated? yes

Verified? yes

Analyst's assessment of simulation: good

Comments: model based on lwaterree.in

D. Model Outputs:

Ammonia model: chronic toxicity (mg/l): 993.8 critical, 2722.9 seasonal

Dissolved oxygen model:

Critical BOD5 (mg/l): 30

Critical NH3-N (mg/l): 20

Effluent DO (mg/l): 2.0

Equivalent UOD: ---

UOD formula: ---

Predicted minimum instream DO (mg/l): 5.46

Effluent flow (mgd/cfs): 1.2 / 1.857

Other parameters: TP 7.09 #/day*, MR TN

Comments: *No net increase in phosphorus loading is allowed due to the TP impairment in Lake Marion. Additional TP loading may be reallocated from existing facilities or available from facilities eliminated/consolidated as a result of this expansion. The amount will depend on their previous performance.

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: Susan Waldner

Date: 6/24/2020

Reviewer: 

Date: 7/22/2020

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 unimplementable 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:	Richland County Eastover Regional WWTP 1.2 MGD
Permit Number:	SC0047911
Receiving Stream:	Wateree River
Date:	6/23/2020
Analyst:	sw

Input Data

Upstream Flow (cfs):	1208
Upstream Total Ammonia Concentration (mg N/L):	0.16
Critical Stream Temperature (deg. C):	29.28
Seasonal Stream Temperature (deg. C):	14.61
Stream pH:	7.5
Discharge Flow (mgd):	1.2
Are Salmonids Present? (yes/no):	no
Are Fish ELS Present? (yes/no):	yes

Instream Total Ammonia Toxicity Results

Season:	<u>Critical</u>	<u>Seasonal</u>
Criterion Maximum Concentration, CMC (mg N/L):	19.890	19.890
Criterion Continuous Concentration, CCC (mg N/L):	1.685	4.338

Discharge Total Ammonia Results

Season:	<u>Critical</u>	<u>Seasonal</u>
Max. Conc. Protecting Against Acute Toxicity (mg N/L):	12857.11	12857.11
Max. Conc. Protecting Against Chronic Toxicity (mg N/L):	993.82	2722.94

Comments

Upstream flow, NH3N from lower wateree model (LWAT1.IN), element just upstream of discharge (9,1).
Temperatures from wateree model temp 2020.xlsx