MEMORANDUM

To: Parties Interested in RFQP2019-19
From: Cindy Clack, Senior Buyer
Date: February 6, 2019
Re: RFQP2019-19 Progressive Design-Build Services Tanners Bridge WWTF Expansion to 1.0 MGD

RFQP2019-19 is attached for your consideration. Anyone accessing this Request for Qualification-Based Proposal from the Barrow County website www.barrowga.org is responsible to ensure the latest documents are in their possession including any addenda. All addenda, questions and answers will be posted on this site. *This site should be visited frequently to insure an awareness of any updates.*

Please ensure proposals are submitted exactly as specified in the RFQP. If you have any questions, please submit them in writing as called for in the RFQP.

Thank you.
REQUEST FOR QUALIFICATION-BASED PROPOSALS
RFQP2019-19

PROGRESSIVE DESIGN-BUILD SERVICES
TANNER’S BRIDGE WWTF EXPANSION TO 1.0 MGD

BARIOW COUNTY, GEORGIA
FEBRUARY 6, 2016

DATE OF OPENING: MARCH 22, 2019
REQUEST FOR QUALIFICATION-BASED PROPOSALS RFQP2019-19

PROGRESSIVE DESIGN BUILD SERVICES
TANNER'S BRIDGE WWTF EXPANSION TO 1.0 MGD
BARROW COUNTY, GEORGIA

Date: February 6, 2019

SECTION 1.0: INTRODUCTION

1.1 Purpose

Barrow County, Georgia (“County”) is seeking qualified firms (hereafter, “Respondents”) to submit responses in the form of Statements of Qualifications with Cost Proposal (“SOQP”) indicating their interest and qualifications for the Progressive Design-Build Services for the design and construction of the Tanner’s Bridge Wastewater Treatment Facility Expansion to 1.0 MGD (Project). The Cost Proposal shall cover Phase 1 work only as described in Section 3.

The SOQPs from Respondents will be reviewed and evaluated using the selection process described herein. After the evaluation of the Respondent’s SOQP, the Project shall be awarded, if at all, to the responsible and responsive Respondent whose proposal is most advantageous to the County unless one or more of such Respondent’s qualifications changes after submission of its SOQP and before the award, and such change results in the Respondent being disqualified under the criteria in the RFQP or otherwise is determined to be not responsible or not responsive to the RFQP. If this occurs, the Project shall be awarded, if at all, to the next most responsible and responsive Respondent, that remains qualified at the time of the award, whose proposal is most advantageous to the County. Each Respondent shall have a continuing duty to notify the County, in writing, in the event that any of its qualifications change on or after the date it submits its SOQP and before the Project is awarded and the construction contract is executed by the County. Any award shall further be conditioned upon provision by the Respondent of appropriate performance and payment bonds covering the Project as provided by applicable law.

Responses to this RFQP will be evaluated to identify a list of qualified Respondents based on the requisite experience, qualifications, and resources to complete the Project successfully within an agreed guaranteed maximum price (GMP) or fixed price and construction schedule in accordance with the Project requirements that will be specified by the County. Submissions will be evaluated in accordance with the evaluation process presented in Section 4 of this RFQP.

1.2 RFQP Organization

This RFQP consists of ten Sections and eleven Appendices:

- Section 1: Introduction
- Section 2: Instructions
- Section 3: Submission Requirements
- Section 4: Evaluation Criteria
- Section 5: Proposal Forms
- Section 7: Bid Bond
The contents of the RFQP Attachments in Appendix 12 take priority over any conflicting statements in the RFQP Sections. Certain project background documents are being made available and are listed in Appendix 12 Attachments for the purpose of preparing Proposals. The Owner is providing these documents only for the purpose of obtaining Proposals for the Project and does not confer a license or grant for any other use. The extent to which the Design-Builder may rely on such background documents is set forth in Section 8 (Sample Progressive Design-Build Contract).

1.3 County Consultant

The County has retained Engineering Management, Inc. (EMI) as the County’s Consultant on this project. EMI will act as liaison and Consultant between the selected Respondent and the County. The Respondent will be required to coordinate all questions, reviews of all plans, specifications, equipment selections and other design details with EMI. EMI will also provide construction phase consulting services and construction observation on the County’s behalf.

1.4 Progressive Design-Build Delivery Services

The Project will follow a Progressive Design-Build (PDB) model. The following services will be required by the selected PDB Company:

Phase 1 – Preconstruction Phase Services

Phase 1 shall consist of planning, permitting, design, bidding of component packages and preparation of a Guaranteed Maximum Price Proposal. Phase 1 is more specifically described as follows:

- Review Existing Design Development Report (“DDR”) and Provide Recommendations – the PDB Company shall review the existing DDR prepared by the County’s Consultant titled “Tanner’s Bridge WWTF 1.0 MGD Mechanical Plant Amendment to Tanner’s Bridge Qualifluent 5.0 MGD WRF DDR” and provide any recommendations regarding the proposed treatment process, etc. The County also wants to discuss the potential costs and operations characteristics of a continuous flow process similar to an oxidation ditch with circular clarifiers.
- Prepare Design Documents – signed and sealed 80% complete engineering drawings, details, and technical specifications for the Phase 2 construction scope of work. The design package will be
assembled in a manner that provides sufficient technical design information for qualified sub-
contractors to prepare competitive bids.

- Design Meetings and Workshop – conduct periodic milestone design workshops (i.e., 30%, 60%,
  and 80% complete) plus periodic meetings with the County and/or EMI to ensure design criteria
  are being met.
- Project Schedule – develop and manage a total project schedule using approved scheduling
  software. Monthly monitoring, updating and reporting will be required.
- Permitting – identify all permits and approvals (environmental, building, local, state, federal, etc.)
  required to design, construct, and commission the project. Permitting activities must be included
  in the project schedule. Includes participation in pre-application meetings, preparation of
  applications and submittals, responses to requests for additional information (RAI’s) and
  developing, implementing and monitoring a permit compliance plan.
- Estimate and Constructability Review at 30% Design – an estimate of construction and a
  constructability review will be performed after the 30% design package is complete. The PDB
  Company will meet with the County and EMI to review the estimate and constructability review
  to determine if the project is within budget. If the estimate is not within budget, a value engineering
  workshop will be conducted to align the scope with the budget.
- Coordination with EMI and County staff regarding the project design phase and permitting.
- Guaranteed Maximum Price (GMP) Proposal Development – at the 80% design stage, a GMP
  Proposal will be developed through an open book bidding of all work packages for the project
  construction (labor, equipment, materials and services) with the exclusion of any sole-sourced
  equipment as defined during the design of the project.
  - The GMP will also include all other direct costs the PDB Company will encounter including
    general condition costs, costs of bonds and insurance, overhead and profit for all work under the
    construction phase, Owner Controlled contingencies (which contingencies, if any, shall be for the
    County’s use and benefit), field management costs, and any allowances.
- GMP Proposal – If a GMP cannot be agreed upon, the County will retain all of the deliverables
  obtained during the first phase of the Project and may use them to re-advertise the Project for
  construction bids or proposals. If a GMP is accepted by the County, a GMP Amendment will be
  executed by the County and the PDB Company in the amount of the agreed GMP for the
  construction of the scope of work outlined in the design documents.

Phase 2 – Construction Phase Services

Phase 2 shall consist of construction services as described below.

- Construction Services – provide management and administration of the PDB Company
  construction phase obligations as defined in the Contract. Construction Phase scope of work will
  include monthly progress/construction meetings; management of subcontractors (contracts,
  insurance, and bonds); preparation of payment requests; shop drawings and equipment Operations
  & Maintenance (O&M) Manual submittal and tracking; tracking of Request for Information and/or
  clarifications (RFI’s); document filing and storage; preparation of record drawings; facility
  training, start-up and commissioning; project close-out; and warranty administration through the
  warranty period.
- Project Schedule – develop and manage a construction phase schedule using approved scheduling
  software. Monthly monitoring, updating and reporting will be required.
- Project Budget Reporting – preparation of a project construction budget and monthly monitoring,
  updating and reporting. Cash flow projections will also be required for the construction phase of
Permitting – tracking of permit compliance, all required regulatory notifications and reporting, proper closeout and/or transfer to the operational phase and receipt of certificate of occupancy.

1.5 Background

The Tanner’s Bridge WWTF is located at 1113 Briscoe Mill Road, Bethlehem, Georgia 30620 and is in the Oconee River Basin. The existing facility is a 0.50 MGD spray irrigation land application system and operates under LAS Permit Number GAJ020271. The County also has a 5.0 MGD NPDES Permit for the facility under Permit Number GA0039314. A Design Development Report for the 5.0 MGD plant was completed and approved in March 2010 (“2010 DDR”). Due to the economy the 5.0 MGD facility was not constructed and the County now desires to phase the expansion of the facility. The County has obtained a revised Waste Load Allocation from the Georgia Department of Natural Resources, Environmental Protection Division (“EPD”) to phase the NPDES permit to 1.0 MGD, 2.0 MGD and 5.0 MGD. EMI has completed a Design Development Report amendment for the phased approach which is currently under review by EPD.

1.6 County’s Objectives

The County’s objectives for delivery of the project are as follows:

- **Quality**: Provide treatment facilities and equipment that will be sustainable and will reliably treat the required quantities of wastewater in full compliance with federal and state regulations and contractual standards for the water quality over the range of the influent water quality conditions.
- **Cost**: Minimize lifecycle cost.
- **Schedule**: Achieve the scheduled completion dates as established in Section 3.6 for design, construction and performance testing of the Project.
- **Risk**: Achieve an optimal balance of risk allocation between the Owner and the Progressive Design Builder.
- **Safety**: Implement an effective safety program incorporating best industry practices.

By selecting the progressive design build delivery method for the Project, the County and County’s Consultant is committed to working in close collaboration with the Progressive Design Builder during Phase One and Two to develop the Project’s design to achieve the Project objectives and to obtain a mutually agreeable GMP for delivery of the Project. As set forth in Volume II (Project Technical Requirements), the Owner has certain technical requirements and standards that will apply to the Project’s design.

1.7 Permits

All anticipated permits for the Project have not been obtained. The following is a list of anticipated permits and their status/responsibility.

- EPD Approval of the Design Development Report – The DDR is currently under review by EPD.
- Land Disturbance Permit – The PDB Contractor will be required to obtain prior to construction.
- Buffer Variance – If a buffer variance is required for the construction of the discharge point the PDB Contractor will be required to prepare and submit the application on behalf of the County.
- Corps of Engineers Permit - If a COE Permit is required for the construction of the discharge point...
the PDB Contractor will be required to prepare and submit the application on behalf of the County.

- **NPDES Permit** – The County’s Consultant will assist the County with modification of the existing NPDES permit prior to construction completion.
- **Electrical Permit** – The PDB Contractor will be required to obtain electrical permits if required by County.
- **Plumbing Permit** - The PDB Contractor will be required to obtain plumbing permits if required by County.
- **EPD Approval of Plans and Specifications** – The PDB Contractor will be required to obtain EPD approval of plans and specifications.

### 1.8 Right-of-Way/Easements

The property for the proposed WWTF is currently owned by the County. Easements required for the discharge force main and property for the proposed discharge point on the Apalachee River will be obtained by the County prior to Construction.

### 1.9 Procurement Process

The procurement will be on a formally advertised basis. All technical requirements, unless otherwise specified, must be met, or be capable of being met by the Proposer or their proposal will be disqualified as being non-responsive.

This section presents an overview of the one-step procurement process, project delivery methodology, access to the RFQP and other documents, and questions regarding the RFQP.

#### 1.9.1 Overview of One-Step Procurement Process

The one-step procurement process consists of a request for qualifications plus a cost proposal. The County will review Respondents based on pre-established evaluation criteria.

Respondents will be required to submit SOQ in a separate envelope and cost proposals for Phase 1 services in a separate envelope. These will be binding proposals for the Project in accordance with the terms and conditions of the RFQP and the Agreement. The County will make an award to the responsible and responsive Proposer whose SOQP is determined in writing to be the most advantageous to the County, taking into consideration the evaluation factors set forth in the RFQP. Proposals deemed non-responsive will be rejected from further review and the Offeror will be advised in writing.

The County will determine which proposals are reasonably susceptible of being selected for award based on the evaluation criteria. The County may also conduct oral presentations/interviews.

It is anticipated that a Guaranteed Maximum Price (GMP) for construction will be proposed at approximately 80 percent design completion stage of Phase 2. Alternatively, to a Guaranteed Maximum Price, and at the County’s sole discretion, the County may elect to accept a proposed fixed price. If the County and the Design Build entity cannot agree on the GMP or fixed price, the County reserves the right to complete the design and execute the project using any construction procurement method determined to be in the County’s best interest.
1.10 Obtaining the RFQP and Other Documents

This document and supporting documents can be downloaded at the Barrow County website, http://www.barrowga.org/departments/bids-RFQPs.aspx.

All supplementary materials related to this RFQP that the County, in its discretion, intends to issue are, or will be made, available to Respondents on the County’s website. Materials that will be available through County’s website include: the RFQP and supplementary documents; and any addenda to the RFQP.

Respondents are solely responsible for obtaining all available information necessary to respond to this RFQP by checking the County’s website on a regular basis or otherwise ensuring that they have all available information to prepare their Response. The County is not responsible to any interested party or Respondent for that party’s failure to obtain all necessary information to respond to the RFQP.

1.11 Accuracy of RFQP and Related Documents

The County assumes no responsibility that the specified technical and background information presented in this RFQP, or otherwise distributed or made available during this procurement process, is complete or accurate. Without limiting the generality of the foregoing, the County will not be bound by or be responsible for any explanation or interpretation of the SOQP documents other than those given in writing as an addendum to this RFQP.

Should a recipient of this RFQP find discrepancies in or omissions from this RFQP and related documents, the recipient of this RFQP shall immediately notify the Purchasing Representative identified in Section 1.12 via the email address provided. A written addendum, if necessary, then will be made available to each recipient of this RFQP.

1.12 Clarifications and Addenda

Respondents may submit requests for clarifications or interpretations regarding this RFQP. Respondents must prepare such requests in writing for the County’s consideration as set forth in this section of this RFQP. The County will not respond to requests, oral or written, received within nine (9) days of the due date for the SOQP. Respondents are advised that this section places no obligation on the part of the County to respond to any or all requests for clarification or interpretation, and that the County’s failure to respond to any such request will not relieve the Respondent of any obligations or conditions required by this RFQP.

Requests for clarification or interpretation regarding this RFQP shall only be submitted in writing via letter or email to the designated Purchasing Representative: Cindy Clack, Senior Buyer (email: cclack@barrowga.org)

Telephone inquiries will not be accepted.

All responses to written requests for clarification, interpretation, or additional information will be distributed as addenda to this RFQP and posted on the Barrow County website, www.barrowga.org.

No oral interpretation, instruction, or information concerning this RFQP given by any employee or agent of the County shall be binding on the County. Respondents who submit a Proposal in reliance on any such oral information risk having their response to this RFQP deemed non-responsive by the County. Only
written responses issued by addendum to this RFQP should be considered by the Respondents.

During the period provided for the preparation of the SOQP, the County may issue addenda to this RFQP. These addenda will be numbered consecutively and will be posted on the Barrow County website, www.barrowga.org. These addenda will be issued by, or on behalf of, the County and will constitute a part of this RFQP. Each Respondent is required to acknowledge receipt of each addendum by submitting an executed acknowledgment form. This acknowledgment shall include all addenda distributed prior to the SOQP Submission Date. All responses to this RFQP shall be prepared with full consideration of the addenda issued prior to the SOQP Submission Date.

1.13 Pre-SOQP Conference

The County will hold a Pre-SOQP Conference, on Tuesday, February 26, 2019 at 10:00 A.M., in the Conference Room of the Barrow County Water and Sewerage Department located at 625 Highway 211 N.E., Winder, Georgia 30680. Attendance at the Pre-SOQP Conference is mandatory for responding to this RFQP. The purpose of the pre-SOQP Conference is to provide information regarding the project and to address questions and concerns regarding the services sought by the County through this RFQP.

1.14 Site Examination

To assist in the preparation of proposals, a site visit will be included with the mandatory Pre-SOQP Conference mentioned above. Site examinations will be confined to the specific areas designated for the proposed construction, including easements and public right-of-way.

1.15 SOQP Due Date

All SOQP’s are due on or before Friday, March 22, 2019 at 12:00 P.M., legal prevailing time in the Barrow County Clerk’s Office and shall be submitted to the attention of:

Danielle Austin, County Clerk  
Barrow County Board of Commissioners  
County Clerk’s Office  
30 North Broad Street  
Winder, GA 30680

Any SOQP’s received after this appointed schedule will be considered late and will be returned unopened to the Proposer. Bids will be opened and read aloud in the Commission Meeting Room on the 2nd floor of the Barrow County Historic Courthouse at the below address at 2:00 PM local time on the above mentioned date. The proposal due date can be changed only by addendum.

1.16 Delivery Requirements

It shall be the sole responsibility of the Respondent to have his/her SOQP delivered to the Barrow County Clerk’s Office for receipt on or before the above stipulated due date and time. The SOQP must be submitted in a sealed envelope/package, addressed to County. Each sealed envelope/package containing a Proposal must be plainly marked on the outside as “RFQP2019-19 Progressive Design Build Services Tanner’s Bridge WWTF Expansion to 1.0 MGD”. If the SOQP is forwarded by mail, the sealed envelope/package containing the SOQP must be enclosed in another envelope/package to the attention of the County at the address above and also marked on the outside as “RFQP2019-19 Progressive Design
Build Services Tanner’s Bridge WWTF Expansion to 1.0 MGD’. The County will not be responsible for late mail deliveries, and no SOQP will be accepted if received after the time as stipulated by this RFQP. No Proposal may be withdrawn or modified in any way after the deadline for the RFQP opening. FAILURE TO COMPLY WITH THE ABOVE INSTRUCTIONS WILL RESULT IN DISQUALIFICATION.

1.17 Additional or Supplemental Information

After receipt of the submittals, the County will evaluate the responses, including the references, financial statements, experience and other data relating to the Respondent’s qualifications. If requested by the County, Respondent’s maybe required to submit additional or supplemental information to determine whether the Respondent meets all of the qualification requirements.

1.18 Contact Person and Inquiries

Any questions or suggestions regarding this RFQP shall be submitted in writing by 5:00 PM local time on Wednesday March 13, 2019 to the Purchasing Representative, Cindy Clack, Senior Buyer (email: cclack@barrowga.org). Any response made by the County shall be provided in writing to all Respondent’s by addendum. No verbal responses shall be authoritative.

1.19 Procurement Schedule

The following is the procurement schedule for this Project and will be strictly adhered to:

<table>
<thead>
<tr>
<th>TASKS</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>RFQP Issued</td>
<td>Wednesday, February 6, 2019</td>
</tr>
<tr>
<td>Pre-SOQP Conference</td>
<td>Tuesday, February 26, 2019</td>
</tr>
<tr>
<td>Last Day for Questions to be submitted</td>
<td>Wednesday, March 13, 2019</td>
</tr>
<tr>
<td>Last Addendum Issued</td>
<td>Monday, March 18, 2019</td>
</tr>
<tr>
<td>SOQP Due Date</td>
<td>Friday, March 22, 2019</td>
</tr>
<tr>
<td>Oral Interviews/Presentations</td>
<td>TBD</td>
</tr>
<tr>
<td>Proposal Discussions, Negotiations, Revisions</td>
<td>TBD</td>
</tr>
<tr>
<td>SOQP Award</td>
<td>Tuesday, May 14, 2019</td>
</tr>
</tbody>
</table>

SECTION 2.0: INSTRUCTIONS

2.1 Definitions and Acronyms

In addition to any other terms that may be defined in this solicitation, the following terms have the following meanings:

**Addendum** – Revision to the RFQP documents issued by the County prior to the receipt of proposals.

**Agreement** – refers to the executed progressive design-build contract between the County and Contractor.

**Allowances** – are defined as sums of monies within the Contract Sum which may at Owner’s option and under terms established in the Contract, be utilized at the Owner’s discretion to supplement corresponding basic requirements of the Contract Documents.
**Approve** – Where used in conjunction with the County’s response to submittals, requests, applications, inquiries, reports and claims, the meaning of the term “approved” shall be held to limitations of the County’s responsibilities and duties as described herein. In no case shall “approval” be interpreted as a release of the PM/CM or other contractors from responsibilities to fulfill the requirements of their Agreements and Contract Documents.

**Bid Bond** – means a bond with good and sufficient surety or sureties for the faithful acceptance of the contract payable to, in favor of, and for the protection of the governmental entity for which the contract is to be awarded, in an amount not less than 5% of the Cost Proposal submitted with the SOQ.

**Calendar Day** – every day shown on the calendar.

**Change Order** – A written order signed by the Owner and Contractor and, stating their agreement upon all of the following: (1) change/modification in the work; (2) the amount of the modification, if any, in the Agreement Price; and (3) the extent of the modification, if any, in the Agreement time.

**Construction Manager (CM)** – the person designated as in charge to lead the day-to-day activities to manage the construction management services.

**Contract Completion** – the established completion date(s) set forth in the contract.

**Contract Documents** – the Contract Documents include the Contract Agreement, Contractor's Bid (including all documentation accompanying the Bid and any post-Bid documentation required by the County prior to the Notice of Award), Bonds, all Special Conditions, General Conditions, Supplementary Conditions, Specifications, Drawings and addenda, together with written amendments, change orders, field orders and the Construction Manager's written interpretations and clarifications issued in accordance with the General Conditions on or after the date of the Contract Agreement. Shop drawing submittals reviewed in accordance with the General Conditions, geotechnical investigations and soils report and drawings of physical conditions in or relating to existing surface structures at or contiguous to the site are not Contract Documents. The Contract Documents shall define and describe the complete work to which they relate.

**Contractor** – the selected offeror with whom the County executes the Agreement.

**County** – Barrow County Government and its authorized representatives.

**Contact Person** – Purchasing staff designated by Barrow County (Purchasing Representative) to whom any questions and/or suggestions should be addressed.

**Final Completion** – the date of final completion of the work is the date certified by the County’s Engineer and the Construction Manager when all construction is fully complete, including certification of all punch list items, and when all records documentation and other closeout items required by the Contract Documents have been reviewed and found acceptable by the County.

**General Conditions** – the General Conditions of the Agreement for construction that govern the rights, duties, and obligations of the parties.

**Guaranteed Maximum Price (GMP)** – the full payment for performance of the work and covers all costs of whatever nature incurred by the Contractor in accomplishing the work in accordance with the provisions
of the Agreement. The contractor is responsible for cost overruns, unless the GMP has been increased via formal Change Order approved by the County (only as a result of additional scope request from the County, not price overruns, errors or omissions).

**Inspector** – an authorized representative of the Progressive Design-Build Team assigned to make all necessary inspections of any or all portions of the Work performed or being performed, or of the materials furnished or being furnished by the Contractor.

**Jobsite** – location where construction activity shall be performed under this contract.

**Joint Venture (JV)** – A contractual agreement joining two or more persons, partnerships, corporations or any combination of business entities partnering as one firm for the purpose of executing a particular project or event. Every entity agrees on percentage of profits, losses and ownership within the organization.

**Materials** – any substance specified for use in the construction of the contract work.

**Modifications** – Binding changes, addenda, revisions, or the like, to the Work or the Agreement documents, including changes to work made by Change Order or Change Directive.

**Notice to Proceed (NTP)** – a written notice from the County to the Contractor to begin the actual contract work on a previously agreed date.

**Offeror** – the entity or individual submitting a proposal in response to this RFQP.

**Owner** – Barrow County Government.

**Owner’s Representative Team** – the Owner’s Representative Team shall include staff from the following departments; General Services, Public Works, Water and Sewerage Department and Owner’s Consultant.

**Payment Bond** – means a bond with good and sufficient surety or sureties payable to the governmental entity for which the work is to be done and intended for the use and protection of all Sub-Contractors and all persons supplying labor, materials, machinery, and equipment in the prosecution of the work provided for in the public works construction contract, and shall be in an amount equal, at all times during the Term, to the GMP.

**Performance Bond** – means a bond with good and sufficient surety or sureties for the faithful performance of the contract and to indemnify the governmental entity for any damages occasioned by a failure to perform the same within the prescribed time. Such bond shall be payable to, in favor of, and for the protection of the governmental entity for which the work is to be done, and shall be in an amount equal, at all times during the Term, to the GMP.

**Plans** – that portion of the Agreement documents describing in drawings, the shapes, outlines, dimensions, characteristics, scope and other similar requirements governing the work, or portions thereof, prepared by the Designer and including revisions thereto. The term is used interchangeably with the word “Drawings” and includes without limitation Standard Details and Drawings.

**Progressive Design Build (PDB)** – A flexible contracting method that allows the Owner and Design-Builder to maximize the benefits of design-build. In a typical application of Progressive Design-Build, the Owner selects the Design-Builder primarily based on qualifications, rather than price; the parties enter
into the contract early in the design phase, allowing substantial design input from both parties; and the
determination of the final contract price (in particular construction cost) is deferred until a point when the
design is well developed and both parties have sufficient information to establish a fair final price
(Completion Stage Price) – whether a stipulated amount (lump sum) or a Guaranteed Maximum Price
(GMP).

**Progressive Design Build Company** – shall mean the single corporate entity contractually responsible to
the Owner for development of the Project. The Design-Builder can be: (1) a firm possessing both design
and construction resources in-house; or (2) a construction contractor led team with the engineer in a
subcontractor role; or (3) a joint venture team between construction contractor and engineer; or (4) an
engineer led team with the construction contractor in a subcontractor role.

**Progress Design Build Company’s Representative** – the PDB Company’s executive representative who
is present on the Jobsite during progress, authorized to receive and fulfill instructions and who shall
supervise and direct the construction.

**Progressive Design Build Contract** – the entire and integrated agreement between the County and the
PDB Company concerning the PDB Project.

**Progressive Design Build Project** – the Design/Build work necessary for the PDB Company to meet the
obligations of the Progressive Design/Build Contract.

**Project** – the project is the total engineering, design, construction, equipment start-up, testing and
acceptance by the County of the Tanner’s Bridge WWTF Expansion Project under a Progressive Design
Build contract.

**Project Manager (PM)** – the person designated as in charge to lead the day-to-day activities to manage
the project schedules.

**Proposal** – the document submitted by the Respondent in response to this RFQP.

**Proposal Bond or Guaranty** – the security furnished with the proposal to guarantee that the Offeror will
enter into a contract if their proposal is accepted by the County; also referred to herein as the Bid Bond.

**Proposer** – the entity or individual submitting a proposal in response to this RFQP.

**Request for Proposal** – all documents, whether attached or incorporated by reference, utilized for
soliciting sealed proposals

**Request for Qualification with Cost Proposal (RFQP)** – all documents, whether attached or
incorporated by reference, utilized for soliciting sealed statement of qualifications and cost proposals.

**Respondent** – the entity or individual offeror submitting a Proposal in response to this RFQP.

**Responsible offeror** – means a person or entity that has the capability in all respects to perform fully and
reliably the contract requirements.

**Responsive offeror** – means a person or entity that has submitted a bid or proposal that conforms in all
material respects to the requirements set forth in the RFQP.
Scope of Work (“Work”) – All the services specified, indicated, shown, or contemplated by the Contract, and furnishing by the Contractor of all materials, equipment, labor, methods, processes, construction and manufacturing materials and equipment, tools, plants, supplies, power, water, transportation and other things necessary to complete such services in accordance with the Contract.

Statement of Qualification with Cost Proposal (“SOQP”) – all documents, whether attached or incorporated by reference, utilized for responding to the RFQP.

Subcontractor – an individual, firm, corporation or any combination thereof, having a direct contract with Contractor for the performance of a part of the Work at the site.

Substantial Completion – the date certified by the County Engineer when all or part of the work, identified in the County Engineer’s certification, is sufficiently completed in accordance with the requirements of the Agreement documents so that the identified portion of the work can be utilized for the purposes for which it is intended.

Work – All the services specified, indicated, shown, or contemplated by the Agreement documents and the furnishing by Contractor of all materials, equipment, labor, methods, processes, construction and other things necessary to complete such services in accordance with the Agreement documents and that will ensure a functional and complete facility.

Written Notice – A written statement transmitted from one party to an authorized representative of another party.

2.2 No Contact During Procurement Process

It is the policy of Barrow County that the evaluation and award process for County contracts shall be free from both actual and perceived impropriety, and that contacts between potential vendors and County officials, elected officials, Consultants and staff regarding pending awards of County contracts shall be prohibited.

A. No person, firm, or business entity, however situated or composed, obtaining a copy of or responding to this solicitation, shall initiate or continue any verbal or written communication regarding this solicitation with any County officer, elected official, employee, or designated County representative, between the date of the issuance of this solicitation and the date of the County Manager’s recommendation to the Board of Commissioners for award of the subject contract, except as may otherwise be specifically authorized and permitted by the terms and conditions of this solicitation.

B. All verbal and written communications initiated by such person, firm, or entity regarding this solicitation, if same are authorized and permitted by the terms and conditions of this solicitation, shall be directed to the Purchasing Representative (see Section 1.12 above).

C. Any violation of this prohibition of the initiation or continuation of verbal or written communications with County officers, elected officials, employees, or designated County representatives shall result in a written finding by the Purchasing Representative that the submitted bid or proposal of the person, firm, or entity in violation is “non-responsive”, and same shall not be considered for award.
2.3 **Reserved Rights**

The County reserves the right to accept or reject any and/or all proposals, to waive irregularities and technicalities, and to request resubmission. Any sole response that is received may or may not be rejected by the County depending on available competition and timely needs of the County. There is no obligation on the part of the County to award the contract to the lowest Respondent and the County reserves the right to award the contract to the responsible Respondents submitting responsive proposals with resulting agreements most advantageous and in the best interest of the County. The County shall be the sole judge of the proposals and the resulting agreements that are in its best interest and its decision shall be final. Also, the County reserves the right to make such investigation as it deems necessary to determine the ability of any Respondent to perform the work or service requested. Information the County deems necessary to make this determination shall be provided by the Respondent. Such information may include, but shall not be limited to, current financial statements by an independent CPA; verification of availability of personnel; and past performance records.

2.4 **Accuracy of RFQP and Related Documents**

The County assumes no responsibility that the specified technical and background information presented in this RFQP, or otherwise distributed or made available during this procurement process, is complete or accurate. Without limiting the generality of the foregoing, the County will not be bound by or be responsible for any explanation or interpretation of the Proposal documents other than those given in writing as an addendum to this RFQP.

Should a recipient of this RFQP find discrepancies in or omissions from this RFQP and related documents, the recipient of this RFQP shall immediately notify the Purchasing Representative identified in Section 1.12 in writing. A written addendum, if necessary, then will be made available to each recipient of this RFQP.

2.5 **Responsibility of Respondent**

Each Respondent is encouraged to conduct all necessary investigations and review all available and relevant data and information, which are necessary in its judgment in order to assume this responsibility prior to the submittal of its Proposal. Respondents are reminded of Barrow County’s “No Contact During Procurement” policy and shall only contact the person designated by the RFQP.

2.6 **Confidential Information**

Barrow County is subject to the Georgia Open Records Act (O.C.G.A. § 50-18-70, et seq.). In accordance with O.C.G.A. § 50-18-72(a)(34), if any Proposal contains any information that the Respondent believes is exempt from disclosure, the Respondent must attach to the records an affidavit affirmatively declaring that specifically identified information in the records constitute trade secrets pursuant to Article 27 of Chapter 1 of Title 10 of the Official Code of Georgia Annotated.

Notwithstanding the foregoing, Respondents recognize and agree that the County, its staff, and its Consultants will not be responsible or liable in any way for any losses that the Respondent may suffer from the disclosure of information or materials to third parties.
2.7 Term of Contract

The term of the contract will be further modified and adjusted. The County anticipates no more than 24 months upon issuance of notice to proceed to the Progressive Design Builder to begin Phase 1 of services.

2.8 Proposal Evaluation

All proposals will be evaluated using the criteria specified in Section 4 of this RFQP. Selection will include an analysis of proposals by an Evaluation Committee composed of County and County Consultant personnel. The committee may request oral interviews and/or site visits. Awards will not be based on cost alone. Other factors, as detailed in the RFQP, will be considered in determining what proposal will be deemed to best meet the needs of Barrow County.

2.9 County Rights and Options

This RFQP constitutes an invitation to submit Proposals to the County. Without limitation or penalty, the County reserves and holds at its sole discretion, the following rights and options:

A. This RFQP does not obligate the County to select, procure or contract for any services whatsoever.

B. The County reserves the right to change or alter the schedule for any events associated with this procurement and, if required, notify the Respondents. A Respondent, by submitting a Proposal, agrees to be bound by any modifications made by the County.

C. All costs incurred by a Respondent in connection with responding to this RFQP, the evaluation and selection process undertaken in connection with this procurement will be borne by the Respondent.

D. The County reserves the right to reject all Proposals and components thereof to eliminate all Respondents responding to this RFQP from further consideration for this procurement, and to notify such Respondents of the County's determination.

E. The County may cancel this RFQP without the substitution of another RFQP at any time without any liability whatsoever.

F. The County reserves the right to waive any technicalities or irregularities in the SOQPs.

G. The County reserves the right to eliminate any Respondent who submits incomplete or inadequate responses or is not responsive to the requirements of this RFQP.

H. The County may request Respondents to send representatives to the County for interviews and presentations.

I. The County reserves the right, without prior notice, to supplement, amend, or otherwise modify this RFQP.

J. All submittals (other than portions thereof subject to patent or copyright protection) become the
property of the County and will not be returned, and the County reserves the right to utilize all such information contained in the Proposals without further cost to the County.

K. The County may add to or delete from the Project Scope of Work set forth in this RFQP.

L. Any and all SOQPs not received by the SOQP Submission Date and Time shall be rejected and returned unopened.

M. Neither the County, its staff, its representatives, nor any of its consultants or attorneys will be liable for any claims or damages resulting from the solicitation, collection, review, or evaluation of responses to this RFQP.

N. The County, including its representatives and consultants, reserves the right to visit and examine any of the facilities referenced in any SOQP and to observe and investigate the operations of such facilities.

O. By responding to this RFQP, Respondents acknowledge and consent to the rights and conditions set forth in this RFQP.

2.10 Georgia Utility Contractor’s License

A Utility Contractor’s License is required to perform this work in accordance with O.C.G.A. § 43-14-8.2(h). Bids for utility contracting projects must be from a licensed utility contractor and that licensed contractor must be the prime on this project. It is not permissible for an unlicensed individual/firm to subcontract with a licensed utility contractor for this project. Form C1: Georgia Utility License Certification in Section 5, Purchasing Forms must be completed and submitted by the contractor performing the work.

2.11 General Contractors License

Effective July 1, 2008, all general contractors are required to be licensed by the State of Georgia to perform the following work: construction, construction management services, or progressive design build services as a prime contractor, joint venture partner, or as a subcontractor to a design professional acting as prime contractor as part of a progressive design build entity or combination, unless exempted from holding such license pursuant to Georgia law (O.C.G.A. § 43-41-17). If exempted, Contractor must submit a copy of their Georgia Department of Transportation Certificate of Qualification with their bid submittal. Proposers must complete Form C2: Georgia General Contractors License Certification in Section 5, Purchasing Forms. Failure to provide the required license(s) shall deem a proposal non-responsive.

2.12 Professional Licenses

The State of Georgia requires that the following professions are required by state law to be licensed:

1. Engineers
2. Architects
3. Surveyors
4. Electricians
5. Plumbers
6. Conditioned Air Contractors
Proposers and any sub-contractors performing any of the above-described work must provide a copy of their license for the work they will perform on this Project. Proposers must complete Form C3: Georgia Professional License Certification in Section 5, Purchasing Forms. Failure to provide the required license(s) shall deem a proposal non-responsive.


Insurance and Risk Management provisions and Indemnification and Hold Harmless provisions are outlined in Section 7 of this RFQP.

Upon award, the successful Proposer must obtain at their expense, a Certificate of Insurance (“COI”) with policy limits equal to or greater than the limits outlined in Section 7. Proof of insurance must be provided to the County prior to the start of any activities/services as described in the bid document(s). Any and all insurance coverage(s) and/or bonds required under the terms and conditions of the contract shall be maintained during the entire term of the contract, including any extensions or renewals thereto, and until all Work has been completed to the satisfaction of the County.

Bonding Requirements:

Regarding submission of surety bonds prior to or subsequent to the Bid submission, the following requirements pertain:

A. Any surety bond submitted in accordance with the Bid or Agreement requirements must be issued by a corporate surety company satisfactory to the County and authorized to act as such in the State of Georgia.

B. Such bonds shall conform to the forms provided with the Bid documents and be completed in accordance with the instructions.

C. In accordance with Georgia law, and upon award of the Agreement, separate performance and payment bonds shall be required of the successful Offeror, each in an amount not less than the total amount payable under the Agreement. The performance bond shall remain in effect for one (1) year after final acceptance of the Work.

D. The payment bond shall remain in effect for the period required under Georgia law for the payment bonds on public construction agreements. Alterations, extensions of the time allowed for performance, extra and additional work, and other changes authorized under the Agreement may be made without notice to or consent of the surety or sureties.

**Bid Bond** – A Bid Bond must be submitted with the SOQP and based on the Phase 1 contract price.

**Payment & Performance Bond** – Once the GMP has been successfully negotiated between the parties at the end of Phase 1, the Contractor shall provide a Payment Bond and Performance Bond each in the amount equal to one hundred percent (100%) of the GMP prior to the execution of the Contract. The Payment and Performance Bond Forms can be found in Section 9 of this RFQP.
2.14 **Liquidated Damages**

The performance of the Work within the specified time is essential to the County. The provision which establishes liquidated damages, of $1,000 per day, to be paid to the County in the event that the Work is not completed and non-performing on schedule is located in the Contract Documents.

2.15 **Cost of Preparation and Selection Process**

There shall be no claims whatsoever against the County, its staff, or its consultants for reimbursement for the costs or expenses (including, but not limited to, engineering and legal costs) incurred during the preparation of the SOQP or other information required by this RFQP or procurement process or in connection with the evaluation process.

2.16 **Termination of Negotiations**

The County at its sole discretion may, at any time, to the extent permitted by Applicable Law, exclude a Proposer from further participation in any negotiation process if the County determines that such Proposer is failing to progress in the negotiations or if the terms of its Proposal are less advantageous than those of other Proposers and such Proposer is deemed to be no longer susceptible of selection. The County will give written notice of its decision to the Proposer, which shall be sent in writing, signed by the County.

2.17 **Right to Protest**

Any actual bidder or offeror that has submitted a bid/proposal for a particular procurement and is aggrieved in connection with the solicitation or award of the contract shall protest in writing to the purchasing agent after the date that the specific bid or proposal is submitted. No protest will be accepted or considered prior to the date the specific bid or proposal is submitted; it will be considered untimely. All protests shall set forth in full detail the factual and legal bases for the protest and specific relief sought by the protestor. Protests arising from factual or legal bases that the protestor knew or should have known prior to the submission of the bid/proposal must be submitted within three (3) business days of the submission of the bid/proposal. Protests arising from factual or legal bases that the protestor knew or should have known subsequent to the date the bid/proposal was submitted must be submitted within ten (10) business days after the protestor knew or should have known of such bases, but in no event shall any protest be submitted more than ten (10) business days after the award of the contract. Untimely protests will not be considered by the Purchasing Representative and will be simply denied as untimely. Decisions on timeliness by the Purchasing Representative are not appealable. An oral protest or a protest to an official, employee, User Department, or other person apart from the Purchasing Representative does not comply.

2.18 **Georgia Security and Immigration Compliance Act**

This Request for Proposal is subject to the Georgia Security & Immigration Compliance Act. Effective July 1, 2013, respondents are notified that all bids/proposals for services that are to be physically performed within the State of Georgia must be accompanied by proof of their registration with and continuing and future participation in the E-Verify program established by the United States Department of Homeland Security. Physical performance of services means any performance of labor or services for a public employer using a bidding process or by contract wherein the labor or services exceed $2,499.99
(except for services performed by an individual who is licensed pursuant to Title 26, Title 43, or the State Bar of Georgia).

A completed contractor affidavit must be submitted on the top of the bid/proposal at the time of submission, prior to the time for opening bids/proposals. Under state law, the County cannot consider any bid/proposal which does not include a completed contractor affidavit. It is not the intent of this notice to provide detailed information or legal advice concerning the Georgia Security & Immigration Compliance Act. All respondents intending to do business with the County are responsible for independently apprising themselves and complying with the requirements of that law and its effect on County procurements and their participation in those procurements. For additional information on the E-Verify program or to enroll in the program, go to: https://www.e-verify.gov/e-verify-enrollment.

The County may conduct random audits of a contractor’s or subcontractors’ compliance with the Illegal Immigration Reform and Enforcement Act and the rules and regulations of the Georgia Department of Labor.

See Section 5, Proposal Forms for declarations and affidavits.

2.19 Authorization to Transact Business

If the Respondent is a Georgia corporation, the corporation, prior to contract execution, shall submit documentary evidence from the Secretary of State that the Corporation is in good standing and that the corporation is authorized to transact business in the State of Georgia.

If the Respondent is a foreign (non-Georgia) corporation, the corporation, prior to contract execution shall submit a Certificate of Authority and documentary evidence from the Georgia Secretary of State of good standing which reflects that the corporation is authorized to do business in the State of Georgia.

2.20 Certification Regarding Debarment

By responding to this RFQP, Respondent certifies that neither it or its subcontractors is presently debarred, suspended, proposed for debarment, declared ineligible, or otherwise excluded from doing business with any government agency. Any such exclusion may cause prohibition of your firm from participating in any procurement by the County.

2.21 Substitution of Approved Key Team Members

The Contractor will be required to submit a written request and obtain from Barrow County’s Contract Manager prior written approval for any substitutions, additions, alterations, or modifications to the Contractor’s originally proposed personnel and project organization, as depicted on the Contractor’s proposed Organization Chart. The substitute personnel shall have the same job classification, as set forth herein or higher (but shall not exceed the approved billing rate) and shall meet or exceed the qualifications and experience level of the previously approved personnel, at no additional cost to the County.

2.22 Non-Collusion

By submitting a signed statement of qualification, Respondent certifies and attests that there has been no collusion with any other Respondent. Reasonable grounds for believing Respondent has an interest in more than one SOQ will result in rejection of all SOQs in which the Respondent has an interest. Any party
to collusion may not be considered in future proposals for the same or similar work. The required non-
collusion affidavit is included in Section 9, Exhibit C.

SECTION 3.0: SUBMISSION REQUIREMENTS

3.1 Submission Instructions

Respondents are required to prepare and submit their responses in accordance with the information
requested in Section 3.3.

All submittals, including all attachments, must be received by the County in a sealed package no later than
Friday, March 22, 2019 at 12:00 P.M. local time. Bids will be opened and read aloud in the Commission
Meeting Room on the 2nd floor of the Barrow County Historic Courthouse at the below address at 2:00
PM local time on the above mentioned date. Each envelope or package shall be clearly marked as follows:

“RFQP2019-19 Progressive Design Build Services Tanner’s Bridge WWTF Expansion to 1.0 MGD"
Name of Firm: Insert D/B Entity submitting SOQP

If the SOQP is forwarded by mail, the sealed envelope/package containing the SOQP must be enclosed in
another envelope/package to the attention of the County Clerk at the address below and also marked on
the outside as “RFQP2019-19 Progressive Design Build Services Tanner’s Bridge WWTF Expansion
to 1.0 MGD”.

Deliver to:

Danielle Austin, County Clerk
Barrow County Board of Commissioners
County Clerk’s Office
30 North Broad Street
Winder, GA 30680

The Proposal shall consist of a Technical Proposal, a Cost Proposal and all documents listed on the
Required Submittal Checklist (Exhibit 1). The Technical Proposal shall include Respondent’s information,
technical information, business-related information, and any Technical Proposal forms requested. The
Cost Proposal shall include the Cost Proposal Forms and any information describing the basis for pricing
and must be separately, sealed, marked and packaged.

The required content of the Technical Proposal and Cost Proposal is further specified in this section of the
RFQP. The Proposal must be signed and acknowledged by the Respondent, including certain information
to be provided under oath as required under applicable law, in accordance with the instructions herein and
the various proposal forms.

THE TECHNICAL PROPOSAL, THE COST PROPOSAL AND CONTRACT COMPLIANCE
EXHIBITS SHALL BE SUBMITTED IN SEPARATE, SEALED ENVELOPES OR PACKAGES.
THE INCLUSION OF ANY COST INFORMATION IN THE TECHNICAL PROPOSAL MAY
RESULT IN SUCH PROPOSAL BEING REJECTED BY THE COUNTY.

Each envelope or package shall be clearly marked as follows:
3.2 Number of Copies

Respondents shall submit the following:

Statement of Qualification (“SOQ”) in a separate sealed envelope, technical proposal and financial information, one (1) marked “Original” (original shall be unbound) and five (5) copies. Also provide one (1) digital copy on thumb drive media in PDF format.

Cost Proposal, one (1) marked “Original” (original shall be unbound) and five (5) copies marked “Copy” in a separate sealed envelope. Also provide one (1) digital copy on thumb drive media in PDF format.

All SOQPs must be complete with all requested information.

3.3 Overview of SOQP Requirements

Respondents shall submit Proposals in accordance with the content and format requirements set forth in this RFQ. Proposals should be clearly organized and structured in a manner that allows materials included in the document to be located easily.

Each of the instructions set forth in this section must be followed for a Proposal to be deemed responsive to this RFQ. In all cases, the County reserves the right to determine, at its sole discretion, whether any aspect of the Proposal meets the requirements set forth in this section. The County reserves the right to reject any SOQP, which in its judgment, does not comply with these SOQP submission requirements.

3.4 Scope of Work

This section describes generally the scope of work and performance guarantees the County is seeking in this RFQP. The Respondent should carefully review the RFQP including the Draft PDB Agreement, Appendices and all addenda to this RFQP to fully understand the scope of work desired by the County, and to determine the best approach to meeting the County’s objectives.

3.4.1 Company Sole Responsibility for Contract Services

The PDB Company shall be solely responsible for performing all contract PDB Work. No conceptual design information or technical requirements contained in this RFQP shall relieve the PDB Company of responsibility for designing and constructing the PDB Work to meet the contract requirements nor shall the inclusion of such information or requirements provide any recourse whatsoever against, or give rise to any liability of, the County, the County Board of Commissioners, County employees or agents, Consultants, or Attorneys for the County.

3.4.2 Progressive Design Build Guarantees

The Respondent shall meet the requirements of the Progressive Design Build Guarantees provisions in accordance with Appendix 11 of this RFQP.
3.4.3 Scope of Work and Desired Outcomes

The following is a general description of the scope of work for the design and construction of the Tanner’s Bridge WWTF Expansion Project. This scope of work contains the major goals and functional elements of the project but is not intended to be an all-inclusive list of the scope of work of the PDB Project.

The Tanner’s Bridge WWTF is located at 1113 Briscoe Mill Road, Bethlehem, Georgia 30620 and is in the Oconee River Basin. The existing facility is a 0.50 MGD spray irrigation land application system and operates under LAS Permit Number GAJ020271. The County also has a 5.0 MGD NPDES Permit for the facility under Permit Number GA0039314. A Design Development Report (DDR) for the 5.0 MGD plant was completed and approved in March 2010. Due to the economy the 5.0 MGD facility was not constructed and the County now desires to phase the facility. The County has obtained a revised Waste Load Allocation from EPD to phase the NPDES permit to 1.0 MGD, 2.0 MGD and 5.0 MGD. EMI has completed a Design Development Report amendment for the phased approach which is currently under review by EPD. The treatment process in the DDR is based on Sequencing Batch Reactor (SBR) technology.

This project will require all engineering, design, construction, and start-up services necessary to complete the expansion of the facility to 1.0 MGD. The existing 0.50 MGD LAS facility will remain in service during and after construction. The PDB Company will be responsible for any and all fines and penalties attributable to the PDB Company’s work.

3.4.3.1 Scope of Work

The Progressive Design Builder will provide services in two distinct phases: Phase One (Phase 1) services generally consist of review of the recently amended DDR included in Section 10 Attachment 4 and providing recommendations based on the proposed design in the DDR and providing recommendations for or against a continuous flow process similar to an oxidation ditch with circular clarifiers. Phase 1 services shall also generally consist of preliminary engineering, geotechnical investigations, as well as, preparation in close collaboration with the County and County’s Consultant, of a proposed price and schedule. (County will provide topographic surveys for the project) The proposed price and schedule includes the Project’s design (developed to the County’s required level of 80% completion), permitting activities, a GMP, Project schedule, and supporting documentation, such as detailed open-book costing for the GMP. Phase 2 services generally encompass completing the Project’s design, construction and performance testing.

Phase 1 Services:

- Develop the Project execution plan, including Project schedule.
- Prepare an evaluation, in collaboration with the Owner, of various treatment options for wastewater treatment & solids handling.
- Perform subsurface investigations, (topographic survey will be provided by the County) and, any additional raw water/wastewater analyses needed to support design and cost estimating.
- Develop opinion of probable cost, including lifecycle costs, for the various alternatives being evaluated.
- Update the Project Execution Plan including the Project Schedule.
- Develop the engineering design (including preparing and submitting intermediate design review packages at 30%, 60% and 80% design completion) and value-engineering activities in conjunction with County’s Consultant.
• Prepare & submit all documents required to meet local, state, federal and any other jurisdictional requirements.
• Prepare a project cost model and provide detailed cost estimates as the design and design alternatives are advanced.
• Submit and negotiate a GMP to complete the Phase 2 services.
• Identify Project permitting requirements and initiate certain permitting activities.

Phase 2 Services:

• Complete the final design.
• Procure equipment and subcontractors. (All work shall be broken down into various acquisition packages and procured with input from the County and County’s Consultant on equipment and systems. Cost will not be the only determining factor in selection of these packages but among the factors that will be considered will be quality, performance, and expected reliability. Progressive Design Build contractor may bid on any of the packages.)
• Secure necessary permits.
• Construct the Project.
• Conduct startup, commissioning and performance testing.
• Provide operator training.
• Provide warranty coverage.

3.4.3.2 Desired Outcomes

The following provides a brief narrative of the desired outcomes of the Progressive Design Build project.

A. Effluent Quality & Quantity
   1. Meet proposed Waste Load Allocation, the NPDES discharge permit requirements to be issued for the expanded plant, and the requirements in the Appendices.
   2. Flows (Provide plant capacity of 1.0 MGD Average Monthly Flow)
   3. Perform all investigation into influent loadings & additional sampling as deemed necessary as stated previously.
   4. Evaluate and implement sludge handling, treatment, dewatering, and disposal methods.

B. Guarantees
   1. Refer also to Appendix 1 and 11.
   2. Noise
      a. Noise levels of various equipment shall be considered and discussed during the design phase.
   3. Odor
      a. Odors from various treatment processes shall be considered and discussed during the design phase.
   4. Life Cycle and Operating Usages and Costs
      a. Power consumption
      b. Chemical consumption
      c. Cost of operation
      d. Other items which may be applicable to evaluate a design.
   5. Treatment guarantees
      a. Whole effluent quality.
b. Process level treatment, which may include:
   1) Screenings and grit removal efficiency
   2) Dewatering performance
   3) Power used to complete nitrification
   4) Other

C. Mitigation of impact to the neighbors
   1. See Noise and Odor guarantees above.
   2. Site Lighting, Architectural, Landscaping

D. Property and existing facilities
   1. The facility entrance will be a new entrance off of Tanner’s Bridge Road. Design for ingress/egress including safety and security enhancements.

E. Direction on equipment and processes
   1. Equipment and system type preferences will be determined during the design phase, including requirements for redundancy.

F. Other items
   1. Site and building security for the new facility.
   2. Stormwater requirements

3.5 Project Deliverables

Respondents shall provide the specific deliverables for this Progressive Design Build project, to achieve the expansion projects goals and objectives to be determined throughout the various phases of the projects. The ultimate deliverable shall be a 1.0 MGD plant meeting all warranty and performance guarantees established during Phase 1 of the project.

3.6 Anticipated Project Schedule

<table>
<thead>
<tr>
<th>Activity/ Key Milestone</th>
<th>Date/Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOC Approval (Phase 1 – Design Services)</td>
<td>May 14, 2019</td>
</tr>
<tr>
<td>Notice to Proceed – for Phase 1 – Design Services</td>
<td>May 29, 2019</td>
</tr>
<tr>
<td>Completion of 80% Design Services</td>
<td>February 2020</td>
</tr>
<tr>
<td>GMP Submittal</td>
<td>February 2020</td>
</tr>
<tr>
<td>BOC Approval (Phase 2 – Construction Services w/ GMP)</td>
<td>March 2020</td>
</tr>
<tr>
<td>Notice to Proceed – for Phase 2 – Construction Services</td>
<td>March 2020</td>
</tr>
<tr>
<td>Substantial Completion</td>
<td>March 2021</td>
</tr>
<tr>
<td>Final Completion</td>
<td>May 2021</td>
</tr>
</tbody>
</table>

All dates are subject to change at Barrow County’s discretion.

3.7 SOQP Format and Content

The SOQP shall include the appropriate and requested information in sufficient detail to demonstrate the Respondent’s knowledge, skills and abilities to provide requested services and will be reviewed and evaluated based on each Respondent’s responses to the criteria described below.

The SOQP shall be arranged and include content as described below:
**Cover Letter (limit 2 pages)**

A duly authorized official of the PDB Entity or lead firm must execute the cover letter. The letter shall briefly introduce the PDB Entity and indicate the entity’s interest in this project as well as a statement indicating that the contents of the submittal are true and accurate. It shall also represent that the PDB entity can meet the insurance and bonding requirements as listed in Section 6.

**Section 1 - Executive Summary (limit 3 pages)**

The executive summary shall include the following information:

A. Provide the full legal name of the entity responding to this proposal.

B. Provide the business type of the entity responding to this RFQP (i.e. Joint Venture, Partnership, etc.).

C. The Executive Summary shall be written in a non-technical style and shall contain sufficient information for the Selection Committee members to become familiar with the Respondent’s SOQ and Proposal and the PDB entity’s ability to satisfy the requirements of the Project.

D. Name, address and telephone number of one (1) individual to whom all future correspondence and/or communications will be directed.

**Section 2 – Management Organization**

A. **Entity Members, Processes, and Responsibilities (limit 3 pages)** – Provide a description of the Respondent Team identifying all entity members, sub-consultants, the anticipated legal relationship among the Prime Team Members (for example, partners, shareholders, client-consultant, etc.), clearly defined and articulated decision-making bodies, and Prime Entity Members’ roles and responsibilities for the key functions.

B. **Organizational Chart (limit 1 page)** - Provide an organizational chart to illustrate how the key team personnel and the firms will function together and the reporting structure. If sub-consultants and subcontractors are not yet known, list the type of sub-consultants and subcontractors. In the organizational chart, illustrate how each type of subcontractor or sub-consultant fits into the team. If not named, the County retains the right to approve subcontractors and sub-consultants.

**Section 3 – Relevant Project Experience (limit 1 page per project)**

The experience of the PDB entity in designing and building wastewater treatment facilities should be submitted. List three (3) projects completed in the past 10 years in the United States.

A. At least two of the projects must be publicly owned wastewater or water treatment facility Design-Build projects.

B. All projects must have a minimum of 0.75 MGD.

C. For each project provide the following information:
1. Project Name
2. Detailed description of the project
3. Date completed and original duration of the contract
4. Referenced information including Owner’s name, contact name, telephone number and email address
5. Indicate the type of delivery method used to deliver the project (e.g., CMR, Progressive D/B, Lump Sum D/B or Traditional Design-Bid-Build)
6. Final Contract Price (including change orders)

D. Provide at least three (3) references for the Design Team the PDB Entity is proposing for this project completed in the past 10 years.

Section 4 – Personnel Experience

Provide the resumes detailing the experience for the following positions that the PDB entity intends to use on this project:

- Project Manager
- Engineering Design Manager
- Construction Superintendent
- QA/QC Manager
- Lead Engineer
- Lead Architect (if applicable)
- Lead Electrical Engineer

Each must have a minimum of 10 years’ experience in design and/or construction of wastewater treatment plants, water treatment plants or reuse facilities. Each resume should be limited to three (3) pages for each position and include the following:

- Name and Title
- Professional Background
- Current and Past Work Experience
- Relevant Training
- Registrations (must be registered in GA within 6 months of time of contract execution)
- Include two (2) references for each key personnel member on similar projects. The references must include the point of contact’s name, address, phone number, and email address.

Qualified Respondents shall retain key members of their team (PDB entity project manager, design manager, construction principal-in-charge, and construction manager) for the duration of the project. Changes in PDB entity key members will require approval from the County.

Section 5 – Additional Information

A. Licensure – The respondent shall include a certificate (copy) of all relevant licenses, certifications, and registrations demonstrating that the PDB entity is licensed to do business in the State of Georgia for all professional services and construction services offered.
B. **Bonding Requirements** – Respondent shall include evidence of the DB entity’s aggregate bonding capacity of at least $30 million and be able to bond a single project for a minimum of $15 million. Provide proof in the form of a letter from the Respondent’s Surety. The letter shall be directly from the Surety and not the Surety’s agent.

### 3.8 Technical Proposal Format And Content

The Technical Proposal shall include the appropriate and requested information in sufficient detail to demonstrate the Respondent’s knowledge, skills and abilities to provide requested services and will be reviewed and evaluated based on Respondent’s responses to the criteria described below. Respondent is allowed to refer to its SOQP.

The Technical Proposal shall be arranged and include content as described below:

**Cover Letter (limit 2 pages)**

A duly authorized official of the PDB Entity or lead firm must execute the cover letter. The letter shall include a statement representing that the contents of the submittal are true and accurate. It shall also state that the PDB Entity intends to execute an agreement as shown in Section 8 (Progressive Design Build agreement) with Barrow County.

**Section 1 – RFQP Response Executive Summary (limit 6 pages)**

The Executive Summary shall be written to provide concise and sufficient information that will provide the Evaluation Committee members with an overview of the respondent’s RFQP packages. It should include an overview of the proposal and highlighting important features. It should include at a minimum:

- A. The PDB entity’s understanding of the project’s goals and objectives and demonstrated understanding of the project’s potential problems and concerns.

- B. Discussion of the PDB entity’s planned project approach including the proposed project delivery and technical approach, management approach, construction approach, safety approach and public relations approach to be utilized in successfully completing the expansion project.

- C. Other pertinent data proposer wishes to provide.

**Section 2 – Project Delivery Approach**

Describe project delivery approach in completing the work identified in Section 3.4 Scope of Work. Such information should include but not be limited to:

- A. Given that an amendment to the DDR for the facility has been completed, describe various design approaches and the application of innovative technology to be considered for the project to achieve required performance and cost effectiveness. The level of efforts should be sufficient to convey concepts to effectively strike the balance between certainty and incorporating innovation to achieve required performance and cost effectiveness.

- B. Discuss how a collaborative relationship with the County would be established during the entire project including the selection of the treatment process, equipment approval, design development,
scheduling and estimating, and construction.

C. Describe design and construction approaches to maintain plant compliance, project schedule and cost. Provide a project schedule that includes each milestone. At a minimum, identify when the major tasks will start and finish.

D. Describe progressive design-build management plan for collaboration and integration of major equipment suppliers to meet project schedule and cost.

E. Describe the process for developing the GMP and adhering to the GMP and schedule.

F. Other pertinent data proposer wishes to provide.

Section 3 – Project Team and Past Project Collaboration

Respondent is allowed to refer to its SOQ.

The purpose of this section is to highlight past project collaborations that key personnel from the PDB entity have completed together. Respondent shall provide the following information:

A. Experience of team members working with each other.

B. Provide list of projects indicating key personnel’s role and responsibilities working together.

C. Location of where work will be performed.

D. Reference contact information for these highlighted projects.

E. Other pertinent data proposer wishes to provide.

Section 4 – Management Approach (10 pages)

Discuss organizational management approach and its ability to successfully manage and complete this project. Outline the proposed approach to project design services and Owners Representative assistance. Such information should include but not be limited to:

A. Approach to Team Leadership: Describe how the Project Manager, Principal-in-Charge, and organizational structure outlined previously in Section 3 support efficient service delivery among both in-house and subcontractor/ sub-consultant personnel.

B. Communication: Describe the plan for coordination and communication with both County staff and internally among project team members, as well as how the design team as a whole will work and interact with the County and County’s consultant. Include a brief description of the Respondent’s approach to external communication with those outside the County organization (e.g., regulatory, permitting authorities, etc.)

C. QA/QC Program: Describe the Respondent’s in-house procedures for ensuring the quality, accuracy and integrity of its work.
D. Tools to Be Utilized: Describe the types of management, software, technological, and other tools the Respondent uses on work of this nature and how use of such tools produces cost, schedule, quality, or other efficiencies.

E. Methods of identifying and resolving issues: Describe the Respondent’s organization, structure, processes, and guidance for identifying and resolving project issues arising internally (by the County or Respondent’s team) or externally (through unforeseen conditions, government regulations, etc.). This includes both proactive (e.g., risk assessment, mitigations, and safety assurance processes) and reactive processes to identify deficiencies following adverse events.

F. Transition Plan from Construction to O&M Staff: Describe the approach and deliverables you intend to use to ensure the Plant will be immediately functional upon its handover to O&M staff.

G. Approach to Cost and Schedule: describe the respondent’s approach to project controls, specifically how design cost and design production schedules will be maintained. List the proposed method to identify and resolve technical, financial, and cost estimating issues during the Project duration; and make critical decisions.

**Section 5 – Current and Projected Workload**

Provide a list of the proposed PDB Team’s current and projected workload.

**Section 6 – Respondent’s Suggested Supplemental Services**

The Respondent shall identify additional scope of work items which they recommend be added to Phase I services that would add value to the Owner. These should be items not previously identified in Section 3.4.3.1. Do not include any pricing for these additional services.

This section will not be scored or evaluated by the Evaluation Committee.

**Section 7 – Respondent’s Financial Information**

The County may elect to conduct a review of a Respondent’s financial responsibility in order to determine the Respondent’s capability to successfully perform the Work. If so, the Respondent shall provide balance sheets, financial statements and any other information required by the County.

If submitting as a Joint Venture, Partnership, Limited Liability Corporation or Limited Liability Partnership, the County may request financials be submitted for each entity that comprises the prime contractor.

The following documentation is required in order for the County to evaluate financial responsibility:

A. Provide your firm’s amount of available credit.

B. Provide your firm’s Dun & Bradstreet (DUNS) number and Federal ID number.

C. Provide a sworn statement that your firm has not filed petition(s) for federal bankruptcy or state insolvency. The statement must be notarized.
3.9 Cost Proposal Format And Content

The Cost Proposal shall be provided in a separate sealed envelope. The cost will only be evaluated based on the cost proposal submitted by the PDB Entity for the Work associated with Phase 1 of the project. The response must include information regarding the expected costs of the work elements associated with both Phase 1 and Phase 2.

The Cost Proposal shall include current information and shall be arranged and include content as described below:

Section 1 - Introduction

The Respondent shall include an introduction which outlines the contents of the Cost Proposal.

Section 2 - Completed Cost Proposal Forms

The Respondent must complete the Price Proposal Form included in Section 9 of this RFQP. An electronic version of this form will be available from Barrow County. This electronic form is provided for the convenience of Respondent and shall be used at Respondent’s risk. The Scope of Phase 1 services is defined in Section 3.4. In preparing the price, Respondents shall assume that they are starting at a 0% design.

The Respondents shall provide the following pricing:

Phase 1 shall be a lump sum bid based on the scope of services described in the RFQP. Items not included in the scope of work but deemed necessary by the PDB firm shall be identified in the Respondent’s proposal, but no fee shall be included. Also include along with the Phase 1 pricing the Contractor’s fee as a percentage of the GMP and the proposed overhead as a percentage of the GMP. Contractor shall describe in detail what is and is not covered by the fee. Only the lump sum fee provided for the Phase 1 design services will be used in the cost comparison, however, the percentages will be evaluated to determine if they are reasonable compared to industry standards and one another. These percentages will be used as guidelines in future negotiations of the remaining phases.

Respondents shall also include proposed billing rates. Billing rates shall include all expenses including reimbursable expenses. Billing Rate shall include all of the Respondent’s overhead and profit for Pre-Construction services and all cost that would be incurred by the Respondent in providing such services, including but not limited to, office space, supplies, computers, software, internet access, materials, payrolls, travel and living expenses, overhead and administrative cost, licenses, insurance, and any other fees or expenses that would be incurred by the Respondent for Pre-Construction services. Billing rates will not be scored but will be used to evaluate the reasonableness of pricing and will be incorporated into the Progressive Design-Build Contract. Respondents shall provide additional billing rate sheets as needed. Further, if Barrow County determines (at its sole discretion) that the price and rates included in a Proposal are below pricing typical of Barrow County projects or that a Respondent’s price and rates are substantially below other Proposals, Barrow County may (at its sole discretion) either declare the Proposal to be non-responsive or seek additional detailed information from that Respondent concerning the cost basis for its price and rate proposal.

Barrow County may conduct formal negotiations with the Selected Respondent prior to presenting the final recommendation for selection to the Board of Commissioners. Barrow County anticipates that these
negotiations will be limited in duration. If Barrow County determines (at its sole discretion) that negotiations with the Selected Respondent cannot be concluded to Barrow County’s satisfaction, then Barrow County may choose to negotiate with the next-ranked Respondent.

Respondent shall include an hourly rate schedule for consultant services: Staff Category Hourly Rate, $/Hour. This information is for the Selection Committee’s information only and will not be scored as part of the evaluation process.

SECTION 4.0: EVALUATION CRITERIA

This section briefly describes the process for evaluating the RFQPs submitted.

4.1 Evaluation Committee

All proposals will be evaluated using the criteria specified in Section 4.4 of this RFQP. Selection will include an analysis of the Proposal by an Evaluation Committee composed of County and County Consultant personnel who will review the submittals in accordance with the submittal requirements and the evaluation criteria set forth in Section 4.4.

4.2 Evaluation and Selection Process

The evaluation process will include a review of each Proposal to verify responsiveness in accordance with Section 4.3 of the RFQP.

The County shall evaluate those Respondents based on the scoring criteria specified in Section 4.4 of this RFQP.

To assist in the evaluation of the Proposals, the Evaluation Committee may in its sole discretion:

A. Seek clarification of a Proposal or supplementary information from any or all Respondents and consider such clarifications and supplementary information in the evaluation of the Proposals.

B. Conduct reference checks relevant to any or all of the references cited in a Response to verify any and all information regarding a Respondent, and

C. Conduct interviews to further clarify and confirm understanding of the proposers’ knowledge of the full scope of the project.

4.3 Responsiveness Review

The Respondent shall submit a Proposal that provides all the information required in accordance with this RFQP. If the Respondent does not fully comply with these requirements, the County may deem the RFQP non-responsive, in which case the Respondent will be disqualified. The County may consider RFQPs non-responsive and the Respondent disqualified if the Proposal is not submitted in the format specified in this RFQP, if the Proposal does not meet the requirements of the RFQP or if the Proposal is incomplete. A Responsiveness Checklist is attached in Section 9.

4.4 Evaluation Criteria
The following criteria will be used to evaluate the qualifications submitted in response to this RFQP:

<table>
<thead>
<tr>
<th>Evaluation Criteria</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Delivery Approach</td>
<td>30%</td>
</tr>
<tr>
<td>Project Team and Past Project Collaboration</td>
<td>15%</td>
</tr>
<tr>
<td>Management Approach</td>
<td>25%</td>
</tr>
<tr>
<td>Current and Projected Workload</td>
<td>15%</td>
</tr>
<tr>
<td>Cost Proposal</td>
<td>15%</td>
</tr>
<tr>
<td><strong>TOTAL POINTS</strong></td>
<td>100%</td>
</tr>
</tbody>
</table>

For the Cost Proposal evaluation the PDB Entity with the lowest Phase 1 cost will receive the full 15 points. For PDB Entity with the second, third, etc., each total cost will be divided into the lowest cost and multiplied by 15, the total points allowed for cost. The County has established the following formula to evaluate cost proposal for this RFQP:

**Lowest cost submitted**

Each successive cost $\times$ Points allocated for cost in RFQP = Cost proposal score

4.4 Notification Of Selection

Upon completion of the evaluation of Proposals, the County shall notify the Respondents in writing of the selected firm.

SECTION 5.0: PROPOSAL FORMS

5.1 Introduction

To be deemed responsive to this RFQP, Respondents must provide the information requested and, where applicable, complete in detail all Proposal Forms. The appropriate individual(s) authorized to commit the Respondent to the Project must sign the Proposal Forms. As appropriate, Respondents shall reproduce each Proposal Form and complete the appropriate portions of the forms provided in this section.

- Form A: Georgia Security and Immigration Contractor Affidavit/Agreement (see Agreement attached at Section 8, Exhibit G.1)
- Form B: Georgia Security and Immigration Subcontractor Affidavit (see Agreement attached at Section 8, Exhibit G.2)
- Form C: Professional License Certifications
- Form C1: Georgia Utility License Contractor License
- Form C2: Georgia General Contractors License
- Form C3: Georgia Professional License

5.2 Proposal Forms Description
Georgia Security and Immigration Contractor Affidavit and Agreement
Proposer shall complete and submit Form A (Agreement Exhibit G.1), in order to comply with the requirements of O.C.G.A. 13-10-91 and the Georgia Department of Labor Rule 300-10-01-.02.

Georgia Security and Immigration Subcontractor Affidavit
Proposer shall ensure that any and all subcontractor(s), that will be utilized for this project shall complete and submit Form B (Agreement Exhibit G.2), Subcontractor Affidavit.

Professional License
Proposer and any subcontractor(s) performing work required by state law to be licensed must provide a copy of their license for the work they will perform on this project.
Instructions:

Contractors must attest to compliance with the requirements of O.C.G.A 13-10-91 and the Georgia Department of Labor Rule 300-10-01-.02 by executing the Contractor Affidavit. See Exhibit G.1 attached to the form of Agreement included herein at Section 8 below.

A completed and properly executed Contractor’s Affidavit must be provided with Respondent’s SOQP in accordance with the instructions provided hereinabove.
FORM B: GEORGIA SECURITY AND IMMIGRATION SUBCONTRACTOR AFFIDAVIT

**Instructions:**

In the event that your company is awarded the contract for this project, and will be utilizing the services of any subcontractor(s) in connection with the physical performance of services pursuant to this contract, the following affidavit must be completed by such subcontractor(s). Your company must provide a copy of each such subcontractor affidavit to Barrow County Government upon execution of the Agreement in accordance with state law.

All subcontractor affidavit(s) shall become a part of the contract and all subcontractor(s) affidavits shall be maintained by your company and available for inspection by Barrow County Government at any time during the term of the contract. All subcontractor(s) affidavit(s) shall become a part of any contractor/subcontractor agreement(s) entered into by your company.

See Exhibit G.2 attached to the form of Agreement included herein at Section 8 below.
FORM C1: CONTRACTOR’S GEORGIA UTILITY LICENSE CERTIFICATION

Contractor’s Name: ________________________________________________________________

Utility Contractor’s Name: __________________________________________________________

Expiration Date of License: ________________________________________________________

I certify that the above information is true and correct and that the classification noted is applicable to the Bid for this Project.

________________________________________
Signed

________________________________________
Date

(ATTACH COPY OF LICENSE)
FORM C2: CONTRACTOR’S GEORGIA GENERAL CONTRACTOR’S LICENSE CERTIFICATION

Contractor’s Name: ____________________________________________________________

General Contractor’s License Number: ____________________________________________

Expiration Date of License: ____________________________________________________

I certify that the above information is true and correct and that the classification noted is applicable to the Bid for this Project.

________________________
Signed

________________________
Date

(ATTACH COPY OF LICENSE)
FORM C3: GEORGIA PROFESSIONAL LICENSE CERTIFICATION

NOTE: Please complete this form for the work your firm will perform on this project.

Contractor’s Name: _____________________________________________________________

Performing work as: Prime Contractor____    Sub-Contractor _____

Professional License Type: _____________________________________________________

Professional License Number: _________________________________________________

Expiration Date of License: _________________________________________________

I certify that the above information is true and correct and that the classification noted is applicable to the Bid for this Project.

________________________________________
Signed

________________________________________
Date

(ATTACH COPY OF LICENSE)
SECTION 6.0: INSURANCE AND RISK MANAGEMENT PROVISIONS

6.1 Insurance and Risk Management Provisions Tanner’s Bridge WWTF Expansion Project

See the insurance, bonding and risk management provisions as mandated in the County’s form of progressive design-build construction contract attached hereto at Section 8 below.
SECTION 7.0: BID BOND

BID BOND REQUIRED WITH SOQP

No bid for a contract in Barrow County for work to be done shall be valid for any purpose unless the Contractor shall give a Bid Bond with good and sufficient surety payable to, in favor of, and for the protection of Barrow County. The Bid Bond shall not be less than 5% of the total amount payable by the terms of the Contract. No bid shall be read aloud or considered if a proper bid bond has not been submitted.

Surety companies executing Bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State of Georgia.

Attestation for the corporation must be by the corporate officer; for a partnership by another partner; for an individual by a notary with the corporate seal.
SECTION 7
BID BOND
BARROW COUNTY BOARD OF COMMISSIONERS
WINDER, GEORGIA

BIDDER (Name and Address):
__________________________________________________________

SURETY (Name and Address of Principal Place of Business):
__________________________________________________________

OWNER (hereinafter referred to as the “County” (Name and Address):
Barrow County Board of Commissioners
30 North Broad Street
Winder, Georgia 30680

BID
BID DUE DATE:
PROJECT (Brief Description Including Location):

BOND
BOND NUMBER:
DATE (Not later than Bid due date):
PENAL SUM: ____________________________ (Words) ____________________________ (Figures)

IN WITNESS WHEREOF, Surety and Bidder, intending to be legally bound hereby to the County, subject to the terms printed below or on the reverse side hereof, do each cause this Bid Bond to be duly executed on its behalf by its authorized officer, agent or representative.

BIDDER
______________________________ (Seal)
Bidder’s Name and Corporate Seal
By: ____________________________
Signature and Title:

SURETY
______________________________ (Seal)
Surety’s Name and Corporate Seal
By: ____________________________
Signature and Title:
(Attach Power of Attorney)

Attest: __________________________
Signature and Title:

Note: (1) Above addresses are to be used for giving any notice required by the terms of this Bid Bond.
(2) Any singular reference to Bidder, Surety, the County or any other party shall be considered plural where applicable.
1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to pay to the County upon Default of Bidder the penal sum set forth on the face of this Bond.

2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension of that time agreed to in writing by the County) the executed Agreement required by the Bidding Documents and any performance and payment Bonds required by the Bidding Documents.

3. This obligation shall be null and void if:
   
   3.1 The County accepts Bidder’s Bid and Bidder delivers within the time required by the Bidding Documents (or any extension of that time agreed to in writing by the County) the executed Agreement required by the Bidding Documents and any performance and payment Bonds required by the Bidding Documents; or
   
   3.2 All Bids are rejected by the County; or
   
   3.3 The County fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension of that time agreed to in writing by Bidder and, if applicable, consented to by Surety when required by paragraph 5 hereof).

4. Payment under this Bond will be due and payable upon Default by Bidder within 30 calendar days after receipt by Bidder and Surety of a written Notice of Default from the County, which Notice will be given with reasonable promptness and will identify this Bond and the Project and include a statement of the amount due.

5. Surety waives notice of, as well as any and all defenses based on or arising out of, any time extension to issue a Notice of Award agreed to in writing by the County and Bidder, provided that the total time, including extensions, for issuing a Notice of Award shall not in the aggregate exceed 120 days from Bid due date without Surety’s written consent.

6. No suit or action shall be commenced under this Bond either prior to 30 calendar days after the Notice of Default required in paragraph 4 above is received by Bidder and Surety or later than one year after Bid due date.

7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the State of Georgia.

8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.

9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent or representative who executed this Bond on behalf of Surety to execute, seal and deliver such Bond and bind the Surety thereby.

10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.

11. The term “Bid” as used herein includes a Bid, offer or proposal, as applicable under the particular circumstances.

12. The terms of this Bid Bond shall be governed by the laws of the State of Georgia.
SECTION 8.0: PROGRESSIVE DESIGN BUILD AGREEMENT AND GENERAL CONDITIONS
This Design-Build Construction Services Agreement (the “Agreement”) is made and entered into this ___ day of ____________, 2019 (the “Effective Date”), by and between BARROW COUNTY, GEORGIA, a political subdivision of the State of Georgia, acting by and through its governing authority, the Barrow County Board of Commissioners (“County”) and ___________________________ [INSERT FULL LEGAL NAME OF CONTRACTOR], a ______________________ [INSERT STATE WHERE CONTRACTOR ENTITY WAS FORMED (E.G., GEORGIA) AND THE TYPE OF ENTITY (E.G., CORPORATION, LIMITED LIABILITY COMPANY, PARTNERSHIP, ETC.)] (hereinafter referred to as the “Contractor”), collectively referred to herein as the “Parties”.

WHEREAS, the County desires to retain a contractor to perform services for the design and construction of a Project, as defined below; and

WHEREAS, the County solicited proposals for design and construction of the Project pursuant to the Request for Qualification-Based Proposals, dated February 6, 2019, attached hereto as “Exhibit A” and incorporated herein by reference; and

WHEREAS, the Contractor submitted a complete and timely proposal, attached hereto as “Exhibit B” and incorporated herein by reference, and met all proposal requirements such that the County awarded Project Number RFQP2019-19 to the Contractor; and

WHEREAS, the County finds that specialized knowledge, skills, and training are necessary to perform the Work (defined below) contemplated under this Agreement; and

WHEREAS, the Contractor has represented that it is qualified by training and experience to perform the Work; and

WHEREAS, based upon Contractor’s proposal, the County has selected Contractor as the successful proposer, and

WHEREAS, Contractor desires to perform the Work as set forth in this Agreement under the terms and conditions provided in this Agreement; and

WHEREAS, the public interest will be served by this Agreement; and

WHEREAS, Contractor has familiarized itself with the nature and extent of the Contract Documents, the Project, and the Work, and with all local conditions and federal, state and local
laws, ordinances, rules and regulations that may in any manner affect cost, progress or performance of Work, and Contractor is aware that it must be licensed to do business in the State of Georgia. **NOW THEREFORE**, for and in consideration of the mutual promises, the public purposes, and the acknowledgements and agreements contained herein and other good and adequate consideration, the sufficiency of which is hereby acknowledged, the Parties hereto do mutually agree as follows:

**Section 1.  Contract Documents**

This Agreement along with the following documents, attached hereto (except as expressly noted otherwise below) and incorporated herein by reference, constitute the “Contract Documents”:

A. Request for Qualification-Based Proposals, attached hereto as “Exhibit A”;

B. Contractor Proposal Documents dated ___________ ____, ______, attached hereto as “Exhibit B”;

C. Scope of Work, attached hereto as “Exhibit C”;

D. Any required Performance Bond and/or Payment Bond, attached hereto collectively as “Exhibits D.1 and D.2”;

E. Noncollusion Affidavit of Prime Proposer, attached hereto as “Exhibit E”;

F. Final Affidavit, attached hereto as “Exhibit F”;

G. Alien Employment affidavits, attached hereto as “Exhibits G.1 and G.2”;

H. Plans, drawings and specifications, attached hereto collectively as “Exhibit H”;

I. Additional Payment/Retainage Requirements, attached hereto as “Exhibit I”;

J. Key Personnel, attached hereto as “Exhibit J”;

K. Contract Administration provisions (if issued), attached hereto as “Exhibit K”;

L. General Conditions (if issued), attached hereto as “Exhibit L”;

M. Supplementary Conditions (if issued), attached hereto as “Exhibit M”;

N. Notice of Award, attached hereto as “Exhibit N”;

O. Barrow County Code of Ethics (codified in the official Code of Barrow County);

P. The following, which may be delivered or issued after the Effective Date of the
Agreement and are not attached hereto: All Change Orders (defined in Section 6 below), other written amendments, and other documents amending, modifying, or supplementing the Contract Documents if properly adopted in writing and executed by the Parties.

Section 2. Project Description; Contract Administrator

A. Project. A general description of the Project is as follows: design and construction of the Tanner’s Bridge Wastewater Treatment Facility (“WWTF”) expansion to 1.0 million gallons per day (“MGD”) (the “Project”).


Section 3. The Work

A. The Work. The Work to be completed under this Agreement (the “Work”) includes, but shall not be limited to, the work described in the Scope of Work provided in “Exhibit C”, attached hereto and incorporated herein by reference. The Work includes all material, labor, insurance, tools, equipment, machinery, water, heat, utilities, transportation, facilities, services and any other miscellaneous items and work reasonably inferable from the Contract Documents. The term “reasonably inferable” takes into consideration the understanding of the Parties that some details necessary for proper execution and completion of the Work may not be shown on the drawings or included in the specifications or Scope of Work, but they are a requirement of the Work if they are a usual and customary component of the Work or are otherwise necessary for proper and complete installation and operation of the Work. Contractor shall complete the Work in strict accordance with the Contract Documents. In the event of any discrepancy among the terms of the various Contract Documents, the provision most beneficial to the County, as determined by the County in its sole discretion, shall govern.

B. Notice to Proceed. The County will issue a Notice to Proceed, which Notice to Proceed shall state the dates for beginning Work (“Commencement Date”) and the Expected Date of Final Completion (defined in Section 4(A) below). Unless otherwise approved, the Contractor shall perform its obligations under this Agreement as expeditiously as is consistent with reasonable skill and care and the orderly progress of the Work.

C. Plans; Drawings and Specifications. The plans, drawings and specifications provided in “Exhibit H”, attached hereto, are hereby acknowledged by the Parties and incorporated herein by reference.

D. Shop Drawings, Product Data, and Samples. Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents, but must be in conformity therewith. The purpose of their submittal is to demonstrate, for those
portions of the Work for which submittals are required by the Contract Documents, the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents.

(i) “Shop Drawings” are drawings, diagrams, schedules and other data specifically prepared for the Work by the Contractor or a subcontractor, sub-subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

(ii) “Product Data” are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

(iii) “Samples” are physical examples that illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

The Contractor shall review for compliance with the Contract Documents and shall approve and submit to the Contract Administrator Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the County or of separate contractors. By approving and submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents that the Contractor has determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents. Submittals which are not marked as reviewed for compliance with the Contract Documents and approved by the Contractor may be returned by the Contract Administrator without action. The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved in writing by the Contract Administrator, provided that submittals that are not required by the Contract Documents may be returned without action.

The Work shall be completed in accordance with approved submittals, provided that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Contract Administrator’s approval of Shop Drawings, Product Data, Samples or similar submittals, unless the Contractor has specifically informed the Contract Administrator in writing of such deviation at the time of submittal and (1) the Contract Administrator has given written approval to the specific deviation as a minor change in the Work, or (2) a written Change Order has been issued and approved to authorize the deviation. The Contract Administrator’s approval of the Shop Drawings, Product Data, Samples or similar submittals shall not relieve the Contractor of responsibility for errors or omissions therein.
The Contractor shall, in writing or on resubmitted Shop Drawings, Product Data, Samples or similar submittals, direct the Contract Administrator’s attention to any additional revisions included other than those requested by the Contract Administrator on previous submittals. In the absence of such written notice drawing the Contract Administrator’s attention to such additional revisions, the Contract Administrator’s approval of a resubmission shall not apply to such additional revisions.

The Contractor shall maintain at the Project site(s) one record copy of the Contract Documents in good order and marked currently to record field changes and selections made during construction and one record copy of approved Shop Drawings, Product Data, Samples and similar required submittals. These documents shall be available to the County and Contract Administrator and shall be delivered to the Contract Administrator or County upon completion of the Work.

Section 4. Contract Term; Liquidated Damages; Expedited Completion; Partial Occupancy or Use

A. Contract Term. The term of this Agreement ("Term") shall commence on the Effective Date and continue until the earlier of the Expected Date of Final Completion or the proper termination and non-renewal of this Agreement (provided that certain obligations, including but not limited to Warranty obligations, will survive termination/expiration of this Agreement). Contractor warrants and represents that it will perform its Work in a prompt and timely manner, which shall not impose delays on the progress of the Work. The Contractor shall commence Work pursuant to this Agreement within five (5) business days of the Commencement Date provided by the County and the Parties intend that substantial completion of construction shall be achieved on or before ________________, 20___ (calculated to be no more than twenty-two (22) months from the County’s issuance of a Notice to Proceed to the Contractor) (the “Expected Date of Substantial Completion”), and all Work shall be completed on or before ________________, 20___ (calculated to be no more than twenty-four (24) months from the County’s issuance of a Notice to Proceed to the Contractor) (the “Expected Date of Final Completion”). Every effort will be made by Contractor to shorten this period. If the Term of this Agreement continues beyond the calendar year in which this Agreement is executed, the Parties agree that this Agreement, as required by O.C.G.A. § 36-60-13, shall terminate absolutely and without further obligation on the part of the County on December 31 each calendar year of the Term, and further, that this Agreement shall automatically renew on January 1 of each subsequent calendar year absent the County’s provision of written notice of non-renewal to Contractor at least five (5) calendar days prior to the end of the then current calendar year. Title to any supplies, materials, equipment, or other personal property shall remain in Contractor until fully paid for by the County.
B. Time is of the Essence; Liquidated Damages. Contractor specifically acknowledges that TIME IS OF THE ESSENCE of this Agreement and that County will suffer financial loss if the Work is not completed in accordance with the deadline for substantial completion specified in Section 4(A) above and within the Contract Documents. The County and Contractor also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by the County if the Work is not completed within the specified times. Accordingly, instead of requiring any such proof, the County and Contractor agree that, as liquidated damages for delay (but not as a penalty), the Contractor shall pay to the County **One Thousand Dollars ($1,000.00)** for each and every calendar day that expires after the deadline for substantial completion provided in the Contract Documents.

C. Expediting Completion. The Contractor is accountable for completing the Work within the time period provided in the Contract Documents. If, in the judgment of the County, the Work is behind schedule and the rate of placement of work is inadequate to regain scheduled progress to ensure timely completion of the entire Work or a separable portion thereof, the Contractor, when so informed by the County, shall immediately take action to increase the rate of work placement by:

(1) An increase in working forces;
(2) An increase in equipment or tools;
(3) An increase in hours of work or number of shifts;
(4) Expediting delivery of materials; and/or
(5) Other action proposed if acceptable to County.

Within five (5) calendar days after such notice from County that the Work is behind schedule, the Contractor shall notify the County in writing of the specific measures taken and/or planned to increase the rate of progress. The Contractor shall include an estimate as to the date of scheduled progress recovery. Should the County deem the plan of action inadequate, the Contractor shall take additional steps to make adjustments as necessary to its plan of action until it meets with the County’s approval and such approval is provided in writing by the County.

D. Partial Occupancy or Use. The County may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement between the County and Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Work. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the County and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. Immediately prior to such partial occupancy or use,
the County, Contractor and Contract Administrator shall jointly inspect the area to be occupied, or portion of the Work to be used, in order to determine and record the condition of the Work. Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

Section 5. **Contractor’s Compensation; Time and Method of Payment**

A. **Contract Price**
   (i) Owner shall pay Design-Builder in accordance with “Exhibit I” the sum of ______________________ Dollars ($________) for the Phase 1 Services, subject to adjustments made in accordance with Section 6 of this Agreement. Unless otherwise provided in the Contract Documents, the Phase 1 Services compensation is deemed to include all sales, use, consumer and other taxes mandated by applicable Legal Requirements.

   (ii) For Phase 2 Services, Owner shall pay Design-Builder in accordance with “Exhibit I” a contract price (“Contract Price”) equal to the Design-Builder’s Fee of ______________ percent (_______%) of the Cost of the Work (excluding work in Phase 1) plus an amount equal to the Design-Builder’s overhead of ______________ percent (_______%) of the Cost of the Work (excluding work in Phase 1) plus the Cost of the Work subject to any Guaranteed Maximum Price (GMP) as set forth in a Contract Price Amendment that may be executed upon the completion of Phase 1 Services.

B. **Additional Payment Requirements.** Additional payment requirements are included as “Exhibit I”, attached hereto and incorporated herein by reference.

C. **Material Deviations.** Any material deviations in tests or inspections performed, or times or locations required to complete such tests or inspections, and like deviations from the Work described in this Agreement shall be clearly communicated to the Contractor before charges are incurred and shall be handled through written Change Orders, as described in Section 6 below. Whenever the Contract Administrator considers it necessary or advisable, it shall have authority to require inspection or testing of the Work. However, neither this authority of the Contract Administrator nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Contract Administrator to the Contractor, subcontractors, material and equipment suppliers, their agents or employees, or other persons or entities performing portions of the Work.

D. **Taxes.** The County is a governmental tax-exempt entity and shall not be responsible for paying any taxes on any materials or services provided for herein. At Contractor’s request, County shall provide evidence of its tax-exempt status. To the extent, if any, that the County furnishes tangible personal property to Contractor for incorporation into the Project, Contractor shall be responsible for paying the amount of tax owed for such tangible personal property.
Section 6. **Change Orders**

A. **Change Order Defined.** A “Change Order” means a written modification of the Contract Documents, signed by representatives of the County and the Contractor with appropriate authorization.

B. **Right to Order Changes.** The County reserves the right to order changes in the Work to be performed under this Agreement by altering, adding to, or deducting from the Work. All such changes shall be incorporated in written Change Orders and executed by the Contractor and the County. Such Change Orders shall specify the changes ordered and any necessary adjustment of compensation and completion time. If the Parties cannot reach an agreement on the terms for performing the changed work within a reasonable time to avoid delay or other unfavorable impacts as determined by the County in its sole discretion, the County shall have the right to determine reasonable terms, and the Contractor shall proceed with the changed work.

C. **Change Order Requirement.** Any work added to the scope of this Agreement by a Change Order shall be executed under all the applicable conditions of this Agreement. No claim for additional compensation or extension of time shall be recognized, unless contained in a written Change Order duly executed on behalf of the County and the Contractor.

D. **Authority to Execute Change Order.** The County Manager has authority to execute, without further action of the Barrow County Board of Commissioners, any number of Change Orders so long as their total effect does not materially alter the terms of this Agreement or materially increase the Maximum Contract Price, as set forth in Section 5(A) above. Any such Change Orders materially altering the terms of this Agreement, or any Change Order increasing the price by more than twenty-five thousand dollars ($25,000.00), must be approved by resolution of the Barrow County Board of Commissioners.

E. **Minor Changes in the Work.** The Contract Administrator will have the authority to order minor changes in the Work not involving adjustment in the Maximum Contract Price or extension of the Term and not inconsistent with the intent of the Contract Documents. Such changes shall be effected by written order signed by the Contract Administrator. The Contractor shall carry out such written orders promptly. If the minor changes subsequently may affect adjustments in the Maximum Contract Price or the Term, the changes shall then be converted to a written Change Order by the requesting Party.

Section 7. **Covenants of Contractor**

A. **Ethics Code; Conflict of Interest.** Contractor agrees that it shall not engage in any
activity or conduct that would result in a violation of the Barrow County Code of Ethics or any other similar law or regulation. Contractor certifies that to the best of his knowledge no circumstances exist which will cause a conflict of interest in performing the Work. Should Contractor become aware of any circumstances that may cause a conflict of interest during the Term of this Agreement, Contractor shall immediately notify the County. If the County determines that a conflict of interest exists, the County may require that Contractor take action to remedy the conflict of interest or terminate the Agreement without liability. The County shall have the right to recover any fees paid for services rendered by Contractor when such services were performed while a conflict of interest existed, if Contractor had knowledge of the conflict of interest and did not notify the County within five (5) business days of becoming aware of the existence of the conflict of interest.

B. Meetings. The Contractor is required to meet with the County’s personnel, or designated representatives, to resolve technical or contractual problems that may occur during the Term of this Agreement at no additional cost to the County. Meetings will occur as problems arise and will be coordinated by the County or the Contract Administrator. The Contractor will be given a minimum of three (3) full business days’ notice of meeting date, time, and location. Face-to-face meetings are desired. However, at the Contractor’s option and expense, a conference call meeting may be substituted. Consistent failure to participate in problem resolution meetings, two consecutive missed or rescheduled meetings, or failure to make a good faith effort to resolve problems, may result in termination of the contract for cause.

C. Expertise of Contractor. Contractor accepts the relationship of trust and confidence established between it and the County, recognizing that the County’s intention and purpose in entering into this Agreement is to engage an entity with the requisite capacity, experience, and professional skill and judgment to provide the Work in pursuit of the timely and competent completion of the Work undertaken by Contractor under this Agreement. The Contractor agrees to use its best efforts, skill, judgment, and abilities to perform its obligations and to further the interests of County and the Project in accordance with County’s requirements and procedures, and Contractor shall employ only persons duly qualified in the appropriate area of expertise to perform the Work described in this Agreement.

D. Proper Execution by Contractor. Contractor agrees that it will perform its services in accordance with the usual and customary standards of the Contractor’s profession or business and in compliance with all federal, state, and local laws, regulations, codes, ordinances, or orders applicable to the Project, including, but not limited to, O.C.G.A. § 50-5-63, any applicable records retention requirements, and Georgia’s Open Records Act (O.C.G.A. § 50-18-70, et seq.). Any additional work or costs incurred as a result of error and/or omission by Contractor as a result of not complying with the Contract Documents or not meeting the applicable standard of care or quality, including but not limited to those of repeated procedures and compensation for the Contract Administrator’s services or expenses, will be
provided at Contractor’s expense and at no additional cost to the County. This provision shall survive termination of this Agreement.

It is the Contractor’s responsibility to be reasonably aware of all applicable laws, statutes, ordinances, building codes, and rules and regulations. If the Contractor observes that portions of the Contract Documents are at variance therewith, the Contractor shall promptly notify the Contract Administrator and the County in writing of any portions of the Contract Documents that are at variance with the applicable laws, statutes, ordinances, building codes, and rules and regulations.

The Contractor’s duties shall not be diminished by any approval by the County or Contract Administrator of Work completed or produced; nor shall any approval by the County or Contract Administrator of Work completed or produced release the Contractor from any liability therefor, it being understood that the County is ultimately relying upon the Contractor’s skill and knowledge in performing the Work required under the Contract Documents.

Organization of the specifications into divisions, sections and articles, and arrangement of drawings shall not control the Contractor in dividing the Work among subcontractors or in establishing the extent of Work to be performed by any trade.

E. Familiarity with the Work.

(i) Contractor Familiarity with Work. Contractor represents that it has familiarized itself with the nature and extent of the Contract Documents, the Work, work site(s), locality, and all local conditions, laws and regulations that in any manner may affect cost, progress, performance, or furnishing of the Work. Since the Contract Documents are complementary, before starting each portion of the Work, the Contractor shall carefully study and compare the various Contract Documents, site conditions, authorities, tests, reports and studies relative to that portion of the Work, as well as the information furnished by the County, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the Project site(s) affecting it. Contractor represents and agrees that it has correlated the results of all such observations, examinations, investigations, explorations, tests, reports, and studies with the terms and conditions of the Contract Documents. These obligations are for the purpose of facilitating construction by the Contractor and are not for the purpose of discovering errors, omissions, inconsistencies, or ambiguities in the Contract Documents; however, any errors, inconsistencies, omissions, or ambiguities discovered by the Contractor shall be reported promptly to the Contract Administrator and County in writing. Contractor represents that it has given the County written notice of all errors, omissions, inconsistencies, or ambiguities that the Contractor has discovered in the Contract Documents so far, and the
written resolution thereof by the County is acceptable to the Contractor. Further, Contractor acknowledges that its obligation to give notice of all such errors, omissions, inconsistencies, or ambiguities shall be continuing during the Term of this Agreement. Any failure on the part of the Contractor to notify the Contract Administrator and County in writing of any errors, omissions, inconsistencies, or ambiguities in the Contract Documents that Contractor discovered or reasonably should have discovered shall result in a waiver and full release by the Contractor of any future arguments or defenses based on such errors, omissions, inconsistencies, or ambiguities against the County. Further, if the Contractor fails to perform its obligations pursuant to this paragraph, the Contractor shall pay such costs and damages to the County as would have been avoided if the Contractor had performed such obligations.

(ii) *Inspection of Prior Work.* If part of the Contractor’s Work depends for proper execution or results upon construction or operations by a separate contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Contract Administrator apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor so to report shall constitute an acknowledgment that the County’s or separate contractor’s completed or partially completed construction is fit and proper to receive the Contractor’s Work, except as to defects not then reasonably discoverable, and Contractor shall be responsible for all costs and damages resulting from its failure to report reasonably discoverable defects.

(iii) *Contractor Requests for Information.* If, with undue frequency (as determined by the County in its sole discretion), the Contractor requests information that is obtainable through reasonable examination and comparison of the Contract Documents, site conditions, and previous correspondence, interpretations or clarifications, the Contractor shall be liable to the County for reasonable charges from the Contract Administrator for the additional services required to review, research and respond to such requests for information.

F. *Supervision, Inspection and Construction Procedures.* The Contractor shall supervise and direct the Work, using the Contractor’s best skill and attention. The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Agreement, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety therefor and, except as stated below, shall be fully and solely responsible for the jobsite safety for such means, methods, techniques, sequences, or procedures. If the Contractor
determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice to the County and Contract Administrator and shall not proceed with that portion of the Work without further written instructions from the County or Contract Administrator as approved in writing by the County.

The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of this Agreement. The Contractor shall take reasonable precautions for the safety of, and shall provide reasonable protection to prevent damage, injury or loss to: (a) employees and other persons who may be affected, (b) the Work and materials and equipment to be incorporated therein, whether in storage on or off the Project site(s), under care, custody or control of the Contractor or Contractor’s subcontractors or sub-subcontractors, and (c) other property at the Project site(s) or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction. The Contractor shall give notices and comply with applicable laws, ordinances, rules, regulations and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss.

When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel. If reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the Project site(s) by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the County and Contract Administrator in writing.

G. Tests and Inspections. Tests, inspections and approvals of portions of the Work required by the Contract Documents or by laws, or ordinances, rules, regulations or orders of public authorities having jurisdiction shall be made promptly at an appropriate time to avoid unreasonable delay in the Work. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the County, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give the Contract Administrator timely notice of when and where tests and inspections are to be made so that the Contract Administrator may be present for such procedures. Required permits or certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and delivered to the Contract Administrator within ten (10) calendar days of issuance.

H. Budgetary Limitations. Contractor agrees and acknowledges that budgetary
limitations are not a justification for breach of sound principals of Contractor’s profession and industry. Contractor shall take no calculated risk in the performance of the Work. Specifically, Contractor agrees that, in the event it cannot perform the Work within the budgetary limitations established without disregarding sound principals of Contractor’s profession and industry, Contractor will give written notice immediately to the County.

I. County’s Reliance on the Work. The Contractor acknowledges and agrees that the County does not undertake to approve or pass upon matters of expertise of the Contractor and that therefore, the County bears no responsibility for Contractor’s Work performed under this Agreement. The Contractor acknowledges and agrees that the acceptance of Work by the County is limited to the function of determining whether there has been compliance with what is required to be produced under this Agreement. The County will not, and need not, inquire into adequacy, fitness, suitability or correctness of Contractor’s performance. Contractor further agrees that no approval of designs, plans, or specifications by any person, body, or agency shall relieve Contractor of the responsibility for adequacy, fitness, suitability, and correctness of Contractor’s Work under professional and industry standards, or for performing services under this Agreement in accordance with sound and accepted professional and industry principles.

J. Contractor’s Reliance on Submissions by the County. Contractor must have timely information and input from the County in order to perform the Work required under this Agreement. Contractor is entitled to rely upon information provided by the County, but Contractor shall be required to provide immediate written notice to the County if Contractor knows or reasonably should know that any information provided by the County is erroneous, inconsistent, or otherwise problematic.

K. Uncovering and Correction of Work. If a portion of the Work is covered contrary to the Contract Administrator’s request or to requirements specifically expressed in the Contract Documents, it must, if required in writing by the Contract Administrator, be uncovered for examination by the Contract Administrator and be replaced at the Contractor’s expense without change in the Agreement Term.

If a portion of the Work has been covered which the Contract Administrator has not specifically requested to examine prior to its being covered or which the Contract Documents did not require to remain uncovered until examined, the Contract Administrator may request to see such Work, and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be at the County’s expense, which expense shall be agreed upon in writing prior to being incurred. If such Work is not in accordance with the Contract Documents, correction shall be at the Contractor’s expense, unless the condition was caused by the County, in which event the County shall be responsible for payment of such costs including reasonable charges, if any, by the Contract Administrator for additional service, which expense shall be agreed upon in writing prior to being
incurred.

If the County prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the County may do so instead of requiring its removal and correction, in which case the Maximum Contract Price will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

L. Clean Up. Contractor shall keep the Project site(s) and surrounding area free from accumulation of waste materials or rubbish caused by operations under this Agreement. At completion of the Work, the Contractor shall remove from and about the Project waste materials, rubbish, the Contractor’s tools, construction equipment, machinery and surplus materials. If the Contractor fails to clean up as provided in the Contract Documents, the County may do so, and the cost thereof shall be charged to the Contractor.

M. Contractor’s Representative. _________________ shall be authorized to act on Contractor’s behalf with respect to the Work as Contractor’s designated representative.

N. Independent Contractor. Contractor hereby covenants and declares that it is engaged in an independent business and agrees to perform the Work as an independent contractor and not as the agent or employee of the County. Nothing contained in this Agreement shall be construed to make the Contractor or any of its employees, servants or subcontractors an employee, servant or agent of the County for any purpose. The Contractor agrees to be solely responsible for its own matters relating to the time and place the Work is performed and the method used to perform such Work; the instrumentalities, tools, supplies, and/or materials necessary to complete the Work; hiring of subcontractors, agents, or employees to complete the Work; and the payment of employees, including benefits and compliance with Social Security, withholding, and all other regulations governing such matters. The Contractor agrees to be solely responsible for its own acts and those of its subordinates, employees, and subcontractors during the life of this Agreement. There shall be no contractual relationship between any subcontractor or supplier and the County by virtue of this Agreement with the Contractor. Any provisions of this Agreement that may appear to give the County the right to direct Contractor as to the details of the services to be performed by Contractor or to exercise a measure of control over such services will be deemed to mean that Contractor shall follow the directions of the County with regard to the results of such services only. It is further understood that this Agreement is not exclusive, and the County may hire additional entities to perform Work related to this Agreement.

Inasmuch as the County and the Contractor are independent of each other, neither has the authority to bind the other to any third person or otherwise to act in any way as the representative of the other, unless otherwise expressly agreed to in writing.
signed by both Parties hereto. The Contractor agrees not to represent itself as the County’s agent for any purpose to any party or to allow any employee of the Contractor to do so, unless specifically authorized, in advance and in writing, to do so, and then only for the limited purpose stated in such authorization. The Contractor shall assume full liability for any contracts or agreements the Contractor enters into on behalf of the County without the express knowledge and prior written consent of the County.

O. Responsibility of Contractor and Indemnification of County. The Contractor covenants and agrees to take and assume all responsibility for the Work rendered in connection with this Agreement. The Contractor shall bear all losses and damages directly or indirectly resulting to it and/or the County on account of the performance or character of the Work rendered pursuant to this Agreement. To the fullest extent permitted by law, Contractor shall defend, indemnify, and hold harmless the County and the County’s elected and appointed officials, officers, boards, commissions, employees, representatives, consultants, servants, agents, attorneys and volunteers (individually an “Indemnified Party” and collectively “Indemnified Parties”) from and against any and all claims, suits, actions, judgments, injuries, damages, losses, costs, expenses and liability of any kind whatsoever, including, but not limited to, attorney’s fees and costs of defense (“Liabilities”), which may arise from or be the result of an alleged willful, negligent, or tortious act or omission arising out of the Work, performance of contracted services, or operations by the Contractor, any subcontractor, anyone directly or indirectly employed by the Contractor or subcontractor, or anyone for whose acts the Contractor or subcontractor may be liable, regardless of whether or not the act or omission is caused in part by a party indemnified hereunder. This indemnity obligation does not include Liabilities caused by or resulting from the sole negligence of an Indemnified Party. Such obligation shall not be construed to negate, abridge, or otherwise reduce any other right or obligation of indemnity which would otherwise exist as to any party or person described in this provision.

In any and all claims against an Indemnified Party, by any employee of the Contractor, its subcontractor, anyone directly or indirectly employed by the Contractor or subcontractor, or anyone for whose acts the Contractor or subcontractor may be liable, the indemnification obligation set forth in this provision shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for the Contractor or any subcontractor under workers’ or workmen’s compensation acts, disability benefit acts, or other employee benefit acts. This obligation to indemnify, defend, and hold harmless the Indemnified Party(ies) shall survive expiration or termination of this Agreement, provided that the claims are based upon or arise out of actions or omissions that occurred during the performance of this Agreement.
P. Insurance.

(1) **Requirements:** The Contractor shall have and maintain in full force and effect for the duration of this Agreement, insurance insuring against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the Work by the Contractor, its agents, representatives, employees or subcontractors. All policies shall be subject to approval by the County as to form and content. These requirements are subject to amendment or waiver if so approved in writing by the County Manager.

(2) **Minimum Limits of Insurance:** Contractor shall maintain the following insurance policies with coverage and limits no less than:

(a) **Commercial General Liability:** $1,000,000 (one million dollars) combined single limit per occurrence comprehensive/extended/enhanced Commercial General Liability policy with coverage including bodily and personal injury, sickness, disease or death, injury to or destruction of property, including loss of use resulting therefrom, damage to premises/operations, products/completed operations, independent consultants and contractual liability (specifically covering the indemnity), broad-from property damage, and underground, explosion and collapse hazard. This coverage may be achieved by using an excess or umbrella policy. The policy or policies must be on “an occurrence” basis (“claims made” coverage is not acceptable). If a general aggregate limit applies, the general aggregate limit shall apply separately to this project/location, and the general aggregate limit shall be twice the required occurrence limit.

(b) **Commercial Automobile Liability (owned, non-owned, hired):** $1,000,000 (one million dollars) combined single limit per occurrence $2,000,000 (two million dollars) aggregate for comprehensive Commercial Automobile liability coverage (owned, non-owned, hired) including bodily and personal injury, sickness, disease or death, injury to or destruction of property, including loss of use resulting therefrom.

(c) **Professional Liability:** $1,000,000 (one million dollars) limit Professional Liability policy for claims arising out of professional services and caused by the Contractor’s errors, omissions, or negligent acts.

(d) **Workers’ Compensation and Employers’ Liability:** Workers’ Compensation policy with limits as required by the State of Georgia and Employers’ Liability limits of $1,000,000 (one million dollars)
per occurrence or disease. (If Contractor is a sole proprietor, who is otherwise not entitled to coverage under Georgia’s Workers’ Compensation Act, Contractor must secure Workers’ Compensation coverage approved by both the State Board of Workers’ Compensation and the Commissioner of Insurance. The amount of such coverage shall be the same as what is otherwise required of employers entitled to coverage under the Georgia Workers’ Compensation Act. Further, the Contractor shall provide a certificate of insurance indicating that such coverage has been secured and that no individual has been excluded from coverage.)

(e) **Builder’s Risk Insurance**: Contractor shall provide a Builder’s Risk Insurance Policy to be made payable to the County and Contractor, as their interests may appear. The policy amount shall be equal to 100% of the Maximum Contract Price, written on a Builder’s Risk “All Risk,” or its equivalent. The policy shall provide, or be endorsed to provide, as follows: “The following may occur without diminishing, changing, altering or otherwise affecting the coverage and protection afforded the insured under this policy: i) Equipment may be delivered to the insured premises and installed in place ready for use; and ii) Partial or complete occupancy by County; and iii) Performance of Work in connection with construction operations insured by the County, by its agents or lessees, or other contractors of the County or using agency.” The insurance coverage shall include extended coverage, and providing coverage for transit, with sub-limits sufficient to insure the full replacement value of the property or equipment removed from its site and while located away from its site until the date of final acceptance of the Work.

(f) **Contractors Pollution Liability Insurance**: Contractors Pollution Liability insurance applicable to the project with liability limits of at least $1,000,000 (one million dollars) per claim or occurrence to cover bodily injury, property damage, cleanup costs, removal, storage, disposal, and/or use of the pollutant, and defense costs and expenses incurred.

(g) **Commercial Umbrella Liability Coverage**: Contractor shall provide a commercial umbrella liability policy with limits of at least $5,000,000 (five million dollars) per occurrence which will apply over all liability policies, without exception, including but not limited to Commercial General Liability, Commercial Automobile Liability, Professional Liability, and Employers’ Liability.

If higher limits are maintained by Contractor than shown above, the County shall be entitled to coverage for any additional insurance proceeds in excess of the specified minimum limits maintained by the Contractor.
(3) **Deductibles and Self-Insured Retentions**: Any deductibles or self-insured retentions must be declared to and approved by the County in writing so that the County may ensure the financial solvency of the Contractor; self-insured retentions should be included on the certificate of insurance.

(4) **Other Insurance Provisions**: Each policy shall contain, or be endorsed to contain, the following provisions respectively:

(a) **General Liability, Automobile Liability and Umbrella Liability Coverage**.

   (i) **Additional Insured Requirement**. The County and County’s elected and appointed officials, officers, boards, commissioners, employees, representatives, consultants, servants, agents and volunteers (individually “Insured Party” and collectively “Insured Parties”) shall be named as additional insureds as respects: liability arising out of activities performed by or on behalf of the Contractor; products and completed operations of the Contractor; premises owned, leased, or used by the Contractor; automobiles owned, leased, hired, or borrowed by the Contractor. The coverage shall contain no special limitations on the scope of protection afforded to the Insured Parties. Nothing contained in this section shall be construed to require the Contractor to provide liability insurance coverage to any Insured Party for claims asserted against such Insured Party for its sole negligence.

   (ii) **Primary Insurance Requirement**. The Contractor’s insurance coverage shall be primary noncontributing insurance as respects to any other insurance or self-insurance available to the Insured Parties. Any insurance or self-insurance maintained by the Insured Parties shall be in excess of the Contractor’s insurance and shall not contribute with it.

   (iii) **Reporting Requirement**. Any failure to comply with reporting provisions of the policies shall not affect coverage provided to the Insured Parties.

   (iv) **Separate Coverage**. Coverage shall state that the Contractor’s insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to limits of insurance provided.
Defense Costs/Cross-Liability. Coverage shall be provided on a “pay on behalf” basis, with defense costs payable in addition to policy limits. There shall be no cross-liability exclusion.

Subrogation. The insurer shall agree to waive all rights of subrogation against the Insured Parties for losses arising from Work performed by the Contractor for the County.

Workers’ Compensation Coverage: The insurer providing Workers’ Compensation Coverage will agree to waive all rights of subrogation against the Insured Parties for losses arising from Work performed by the Contractor for the County.

All Coverages:

Notice Requirement. Each insurance policy required by this Agreement shall be endorsed to state that coverage shall not be reduced, suspended, voided, or canceled except after thirty (30) calendar days prior written notice (or 10 calendar days if due to non-payment) has been given to the County. In addition, Contractor shall provide written notice to County at least thirty (30) days prior to any reduction, suspension, voiding, or cancellation of coverage. The County reserves the right to accept alternate notice terms and provisions, provided they meet the minimum requirements under Georgia law.

Starting and Ending Dates. Policies shall have concurrent starting and ending dates.

Incorporation of Indemnification Obligations. Policies shall include a Project-specific endorsement incorporating the indemnification obligations assumed by the Contractor under the terms of this Agreement, including but not limited to Section 7(O) of this Agreement.

Acceptability of Insurers: The insurance to be maintained by Contractor must be issued by a company licensed or approved by the Insurance Commissioner to transact business in the State of Georgia. Such insurance shall be placed with insurer(s) with an A.M. Best Policyholder’s rating of no less than “A-” and with a financial rate of Class VII or greater. The Contractor shall be responsible for any delay resulting from the failure of its insurer to provide proof of coverage in the proscribed form.
(6) Verification of Coverage: Contractor shall furnish to the County for County approval certificates of insurance and endorsements to the policies evidencing all coverage required by this Agreement prior to the start of work. Without limiting the general scope of this requirement, Contractor is specifically required to provide an endorsement naming the County as an additional insured when required. The certificates of insurance and endorsements for each insurance policy are to be on a form utilized by Contractor’s insurer in its normal course of business and are to be signed by a person authorized by that insurer to bind coverage on its behalf, unless alternate sufficient evidence of their validity and incorporation into the policy is provided. The County reserves the right to require complete, certified copies of all required insurance policies at any time. The Contractor shall provide proof that any expiring coverage has been renewed or replaced prior to the expiration of the coverage.

(7) Subcontractors: Contractor shall either (1) ensure that its insurance policies (as described herein) cover all subcontractors and the Work performed by such subcontractors or (2) ensure that any subcontractor secures separate policies covering that subcontractor and its Work. All coverage for subcontractors shall be subject to all of the requirements stated in this Agreement, including, but not limited to, naming the Insured Parties as additional insureds.

(8) Claims-Made Policies: Contractor shall extend any claims-made insurance policy for at least six (6) years after termination or final payment under the Agreement, whichever is later, and have an effective date which is on or prior to the Effective Date.

(9) Progress Payments: The making of progress payments to the Contractor shall not be construed as relieving the Contractor or its subcontractor or insurance carriers from providing the coverage required in this Agreement.

Q. Bonds. In public works construction contracts valued at more than one hundred thousand dollars ($100,000.00) or road construction/maintenance contracts valued at five thousand dollars ($5,000.00) or more, or in any other instance where the County has elected to include such bond requirements as exhibits to this Agreement, the Contractor shall provide Performance and Payment bonds on the forms attached hereto as “Exhibits D.1 and D.2” and with a surety licensed to do business in Georgia and listed on the Treasury Department’s most current list (Circular 570 as amended). Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under this Agreement, the Contractor shall promptly furnish a copy of the bonds or shall permit a copy to be made.

R. Assignment of Agreement. The Contractor covenants and agrees not to assign or transfer any interest in, or delegate any duties of this Agreement, without the prior
express written consent of the County. As to any approved subcontractors, the Contractor shall be solely responsible for reimbursing them, and the County shall have no obligation to them.

S. Employment of Unauthorized Aliens Prohibited – E-Verify Affidavit. Pursuant to O.C.G.A. § 13-10-91, the County shall not enter into a contract for the physical performance of services unless:

(1) the Contractor shall provide evidence on County-provided forms, attached hereto as “Exhibits G.1 and G.2” (affidavits regarding compliance with the E-Verify program to be sworn under oath under criminal penalty of false swearing pursuant to O.C.G.A. § 16-10-71), that it and its subcontractors have registered with, are authorized to use and use the federal work authorization program commonly known as E-Verify, or any subsequent replacement program, in accordance with the applicable provisions and deadlines established in O.C.G.A. § 13-10-91, and that they will continue to use the federal work authorization program throughout the contract period, or

(2) the Contractor provides evidence that it is not required to provide an affidavit because it is an individual licensed pursuant to Title 26 or Title 43 or by the State Bar of Georgia and is in good standing.

The Contractor hereby verifies that it has, prior to executing this Agreement, executed a notarized affidavit, the form of which is provided in “Exhibit G.1”, and submitted such affidavit to County or provided the County with evidence that it is an individual not required to provide such an affidavit because it is licensed and in good standing as noted in sub-subsection (2) above. Further, Contractor hereby agrees to comply with the requirements of the federal Immigration Reform and Control Act of 1986 (IRCA), P.L. 99-603, O.C.G.A. § 13-10-91 and Georgia Department of Labor Rule 300-10-1-.02.

In the event the Contractor employs or contracts with any subcontractor(s) in connection with the covered contract, the Contractor agrees to secure from such subcontractor(s) attestation of the subcontractor’s compliance with O.C.G.A. § 13-10-91 and Rule 300-10-1-.02 by the subcontractor’s execution of the subcontractor affidavit, the form of which is attached hereto as “Exhibit G.2”, which subcontractor affidavit shall become part of the contractor/subcontractor agreement, or evidence that the subcontractor is not required to provide such an affidavit because it is licensed and in good standing as noted in sub-subsection (2) above. If a subcontractor affidavit is obtained, Contractor agrees to provide a completed copy to the County within five (5) business days of receipt from any subcontractor.

Where Contractor is required to provide an affidavit pursuant to O.C.G.A. § 13-10-91, the County Manager or his/her designee shall be authorized to conduct an inspection of the Contractor’s and Contractor’s subcontractors’ verification process.
at any time to determine that the verification was correct and complete. The Contractor and Contractor’s subcontractors shall retain all documents and records of their respective verification process for a period of five (5) years following completion of the contract. Further, where Contractor is required to provide an affidavit pursuant to O.C.G.A. § 13-10-91, the County Manager or his/her designee shall further be authorized to conduct periodic inspections to ensure that no County Contractor or Contractor’s subcontractors employ unauthorized aliens on County contracts. By entering into a contract with the County, the Contractor and Contractor’s subcontractors agree to cooperate with any such investigation by making their records and personnel available upon reasonable notice for inspection and questioning. Where a Contractor or Contractor’s subcontractors are found to have employed an unauthorized alien, the County Manager or his/her designee may report same to the Department of Homeland Security. The Contractor’s failure to cooperate with the investigation may be sanctioned by termination of the contract, and the Contractor shall be liable for all damages and delays occasioned by the County thereby.

Contractor agrees that the employee-number category designated below is applicable to the Contractor. [Information only required if a contractor affidavit is required pursuant to O.C.G.A. § 13-10-91.]

_____ 500 or more employees.
_____ 100 or more employees.
_____ Fewer than 100 employees.

Contractor hereby agrees that, in the event Contractor employs or contracts with any subcontractor(s) in connection with this Agreement and where the subcontractor is required to provide an affidavit pursuant to O.C.G.A. § 13-10-91, the Contractor will secure from the subcontractor(s) such subcontractor(s’) indication of the above employee-number category that is applicable to the subcontractor.

The above requirements shall be in addition to the requirements of State and federal law and shall be construed to be in conformity with those laws.

T. Records, Reports and Audits.

(1) Records:

(a) Books, records, documents, account ledgers, data bases, and similar materials relating to the Work performed for the County under this Agreement (“Records”) shall be established and maintained by the Contractor in accordance with applicable law and requirements prescribed by the County with respect to all matters covered by this Agreement. Except as otherwise authorized or required, such Records shall be maintained for at least three (3) years from the date
that final payment is made to Contractor by County under this Agreement. Furthermore, Records that are the subject of audit findings shall be retained for three (3) years or until such audit findings have been resolved, whichever is later.

(b) All costs claimed or anticipated to be incurred in the performance of this Agreement shall be supported by properly executed payrolls, time records, invoices, contracts, or vouchers, or other official documentation evidencing in proper detail the nature and propriety of the charges. All checks, payrolls, invoices, contracts, vouchers, orders, or other accounting documents pertaining in whole or in part to this Agreement shall be clearly identified and readily accessible.

(2) **Reports and Information**: Upon request, the Contractor shall furnish to the County any and all Records in the form requested by the County. All Records stored on a computer database must be of a format compatible with the County’s computer systems and software.

(3) **Audits and Inspections**: At any time during normal business hours and as often as the County may deem necessary, Contractor shall make available to the County or County’s representative(s) for examination all Records. The Contractor will permit the County or County’s representative(s) to audit, examine, and make excerpts or transcripts from such Records. Contractor shall provide proper facilities for County or County’s representative(s) to access and inspect the Records, or, at the request of the County, shall make the Records available for inspection at the County’s office. Further, Contractor shall permit the County or County’s representative(s) to observe and inspect any or all of Contractor’s facilities and activities during normal hours of business for the purpose of evaluating Contractor’s compliance with the terms of this Agreement. In such instances, the County or County’s representative(s) shall not interfere with or disrupt such activities.

U. **Confidentiality.** Contractor acknowledges that it may receive confidential information of the County and that it will protect the confidentiality of any such confidential information and will require any of its subcontractors, contractors, and/or staff to likewise protect such confidential information. The Contractor agrees that confidential information it receives or such reports, information, opinions, or conclusions that Contractor creates under this Agreement shall not be made available to, or discussed with, any individual or organization, including the news media, without prior written approval of the County. Contractor shall exercise reasonable precautions to prevent the unauthorized disclosure and use of County information whether specifically deemed confidential or not.

Contractor acknowledges that the County’s disclosure of documentation is
governed by Georgia’s Open Records Act, and Contractor further acknowledges that, if Contractor submits records containing trade secret information and if Contractor wishes to keep such records confidential, Contractor must submit and attach to such records an affidavit affirmatively declaring that specific information in the records constitutes trade secrets pursuant to Article 27 of Chapter 1 of Title 10, and the Parties shall follow the requirements of O.C.G.A. § 50-18-72(a)(34) related thereto.

V. Licenses, Certifications and Permits. The Contractor covenants and declares that it has obtained all diplomas, certificates, licenses, permits, or the like required of the Contractor by any and all national, state, regional, county or local boards, agencies, commissions, committees or other regulatory bodies in order to perform the Work contracted for under this Agreement; provided that some permits or licenses related to the Project may be obtained as part of the Work and shall be obtained as required. The Contractor shall secure and pay for the building permit and other permits and governmental fees, licenses and inspections necessary for proper execution and completion of the Work, which are customarily secured after execution of the Agreement and which are legally required. Contractor shall furnish copies of such permits, licenses, etc. to the County within ten (10) days after issuance.

W. Key Personnel. All of the individuals identified in “Exhibit J”, attached hereto, are necessary for the successful completion of the Work due to their unique expertise and depth and breadth of experience. There shall be no change in Contractor’s Project Manager or members of the Project team, as listed in “Exhibit J”, without written approval of the County. Contractor recognizes that the composition of this team was instrumental in the County’s decision to award the Work to Contractor and that compelling reasons for substituting these individuals must be demonstrated for the County’s consent to be granted. Any substitutes shall be persons of comparable or superior expertise and experience. Failure to comply with the provisions of this paragraph shall constitute a material breach of Contractor’s obligations under this Agreement and shall be grounds for termination.

X. Authority to Contract. The Contractor covenants and declares that it has obtained all necessary approvals of its board of directors, stockholders, general partners, limited partners, or similar authorities to simultaneously execute and bind Contractor to the terms of this Agreement, if applicable.

Y. Ownership of Work. All reports, designs, drawings, plans, specifications, schedules, work product, and other materials, including those in electronic form, prepared or in the process of being prepared for the Work to be performed by the Contractor (“Materials”) shall be the property of the County, and the County shall be entitled to full access and copies of all Materials in the form prescribed by the County. Any Materials remaining in the hands of the Contractor or subcontractor upon completion or termination of the Work shall be delivered immediately to the
County whether or not the Project or Work is commenced or completed, provided, however, that Contractor may retain a copy of any deliverables for its records. The Contractor assumes all risk of loss, damage or destruction of or to Materials. If any Materials are lost, damaged, or destroyed before final delivery to the County, the Contractor shall replace them at its own expense. Any and all copyrightable subject matter in all Materials is hereby assigned to the County, and the Contractor agrees to execute any additional documents that may be necessary to evidence such assignment.

Z. **Nondiscrimination.** In accordance with Title VI of the Civil Rights Act of 1964, as amended, 42 U.S.C. § 2000d, section 303 of the Age Discrimination Act of 1975, as amended, 42 U.S.C. § 6102, section 202 of the Americans with Disabilities Act of 1990, 42 U.S.C. § 12132, and all other provisions of Federal law, the Contractor agrees that, during performance of this Agreement, Contractor, for itself, its assignees and successors in interest, will not discriminate against any employee or applicant for employment, any subcontractor, or any supplier because of race, color, creed, national origin, gender, age or disability. In addition, Contractor agrees to comply with all applicable implementing regulations and shall include the provisions of this paragraph in every subcontract for services contemplated under this Agreement.

**Section 8. Covenants of the County**

A. **Right of Entry.** County shall provide for right of entry for Contractor and Contractor’s equipment as required for Contractor to complete the Work; provided that Contractor shall not unreasonably encumber the Project site(s) with materials or equipment.

B. **County’s Representative.** Chip McGaughey, P.E. with Engineering Management, Inc. shall be authorized to act on County’s behalf with respect to the Work as the County’s designated representative on this Project; provided that any changes to the Work or the terms of this Agreement must be approved as provided in Section 6 above.

**Section 9. Final Project Documents; Warranty**

A. **Final Project Documents.** Prior to final payment, Contractor shall deliver to County a written assignment of all warranties, guaranties, certificates, permits, and other documents, including without limitation, all contractors’ and manufacturers’ warranties. At such time, Contractor shall also deliver to the County copies of all as-built drawings, operations, and maintenance manuals, and any other pertinent documents relating to the construction and operation of the Work that is not otherwise in the possession of the County.

B. **Warranty.** The Contractor warrants to the County and the Contract Administrator that materials and equipment furnished under the Agreement will be of good quality
and new, unless otherwise required or permitted by the Contract Documents, that the Work will be free from defects not inherent in the quality required or permitted, and that the Work will conform to the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, is considered defective. This warranty excludes remedy for damage or defect caused by abuse by the County or modifications to the Work not executed by the Contractor or an employee/subcontractor/sub-subcontractor thereof.

Except as may be otherwise specified or agreed, the Contractor shall repair or replace all defects in materials, equipment, or workmanship appearing within one (1) year (the “Warranty Period”) from the date of Substantial Completion (as defined in “Exhibit I”, attached hereto and incorporated herein by reference) at no additional cost to the County. An inspection shall be conducted by the County or its representative(s) near the completion of the respective Warranty Period to identify any issues that must be resolved by the Contractor. After start up, the County shall be responsible for repairing issues resulting from normal wear and tear and shall be responsible for general maintenance of the equipment; however, expiration of any Warranty Period shall not affect the Contractor’s continued liability under an implied warranty of merchantability and fitness. All warranties implied by law, including fitness for a particular purpose and suitability, are hereby preserved and shall apply in full force and effect beyond any Warranty Period County may purchase additional maintenance services from the Contractor upon a written proposal for such services being executed by authorized representatives of both Parties, and upon execution, such proposal for additional services shall be incorporated herein by this reference.

Section 10. **Termination**

A. **For Convenience.** The County may terminate this Agreement for convenience at any time upon providing written notice thereof to Contractor at least seven (7) calendar days in advance of the termination date.

B. **For Cause.** The Contractor shall have no right to terminate this Agreement prior to completion of the Work, except in the event of County’s failure to pay the Contractor within thirty (30) calendar days of Contractor providing the County with notice of a delinquent payment and an opportunity to cure. The County may terminate this Agreement for cause as provided in Section 11 of this Agreement. The County shall give Contractor at least seven (7) calendar days’ written notice of its intent to terminate the Agreement for cause and the reasons therefor, and if Contractor, or its Surety, fails to cure the default within that period, the termination shall take place without further notice. The County shall then make alternative arrangements for completion of the Project.

C. **Statutory Termination.** In compliance with O.C.G.A. § 36-60-13, this Agreement shall be deemed terminated as provided in Section 4(A) of this Agreement. Further,
this Agreement shall terminate immediately and absolutely at such time as appropriated or otherwise unobligated funds are no longer available to satisfy the obligation of the County.

D. Payment. Provided that no damages are due to the County for Contractor’s failure to perform in accordance with this Agreement, and except as otherwise provided herein, the County shall, upon termination for convenience or statutory termination, pay Contractor for Work performed prior to the date of termination in accordance with Section 5 herein. The County shall have no further liability to Contractor for such termination. At its sole discretion, the County may pay Contractor for additional value received as a result of Contractor’s efforts, but in no case shall said payment exceed any remaining unpaid portion of the Maximum Contract Price.

If this Agreement is terminated for cause, the County will make no further payment to the Contractor or its Surety until the Project is completed and all costs of completing the Project are paid. If the unpaid balance of the amount due the Contractor, according to this Agreement, exceeds the cost of finishing the Project, County shall provide payment to the Contractor (or its Surety) for services rendered and expenses incurred prior to the termination date, provided that such payment shall not exceed the unpaid balance of the amount otherwise payable under this Agreement minus the cost of completing the Project. If the costs of completing the Project exceed the unpaid balance, the Contractor or its Surety shall pay the difference to the County.

E. Assumption of Contracts. The County reserves the right in termination for cause to take assignment of all contracts between the Contractor and its subcontractors, vendors, and suppliers. The County will promptly notify the Contractor of the contracts the County elects to assume. Upon receipt of such notice, the Contractor shall promptly take all steps necessary to effect such assignment.

F. Conversion to Termination for Convenience. If the County terminates this Agreement for cause and it is later determined that the County did not have grounds to do so, the termination will be converted to and treated as a termination for convenience under the terms of Section 10(A) above.

G. Requirements Upon Termination. Upon termination, the Contractor shall: (1) promptly discontinue all services, cancel as many outstanding obligations as possible if requested to do so by the County, and not incur any new obligations, unless the County directs otherwise; and (2) promptly deliver to the County all data, drawings, reports, summaries, and such other information and materials as may have been generated or used by the Contractor in performing this Agreement, whether completed or in process, in the form specified by the County.

H. Reservation of Rights and Remedies. The rights and remedies of the County and the Contractor provided in this Section are in addition to any other rights and
remedies provided under this Agreement or at law or in equity.

Section 11. County’s Rights; Contractor Default

A. County Rights Related to the Work.

(i) County’s Right to Stop the Work. If the Contractor fails to correct Work which is not in accordance with the requirements of the Contract Documents, as required by the Contract Administrator, or persistently fails to carry out Work in accordance with the Contract Documents, the County may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the County to stop the Work shall not give rise to a duty on the part of the County to exercise this right for the benefit of the Contractor or any other person or entity. Such a stoppage of Work shall not extend the Expected Date of Final Completion of the Work.

(ii) County’s Right to Carry Out the Work. If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a seven (7) calendar day period after receipt of written notice from the County to commence and/or continue correction of such default or neglect with diligence and promptness, the County may, without prejudice to other remedies the County may have, correct such deficiencies. In such case, an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including County’s expenses and compensation for the Architect/Engineer’s and/or Contract Administrator’s additional services (if any) made necessary by such default, neglect or failure. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the County.

B. Contractor Default. For the purposes of this Agreement, Contractor shall be in default if any of the following occur during the Term of this Agreement: (a) a failure to fulfill in a timely and proper manner Contractor’s obligations under this Agreement; (b) Contractor violates any of the material provisions, agreements, representations or covenants of this Agreement or any applicable city, state, or federal laws, which do not fall within the force majeure provisions of this Agreement; (c) the Contractor becomes insolvent or unable to pay its debts as they mature, or makes an assignment for the benefit of creditors, or files a bankruptcy petition under the United States Bankruptcy Code; or (d) Contractor is the subject of a judgment or order for payment of money, which judgment or order exceeds $100,000 and is no longer subject to appeal or, in the opinion of the County, would be fruitless to appeal and where (i) such judgment or order shall continue un-discharged or unpaid for a period of thirty (30) calendar days, (ii) an insurer acceptable to the County has not acknowledged that such judgment or order is fully covered by a relevant policy of insurance, or (iii) the County is otherwise reasonably satisfied that such judgment or order is not likely to be satisfied or complied with within sixty (60) calendar days of its issuance.
In the event of Contractor’s default under this Agreement, the County shall send written notice to the Contractor setting forth the specific instances of the default and providing the Contractor with at least seven (7) calendar days to cure or otherwise remedy the default to the reasonable satisfaction of the County. If the default is not remedied during the stated cure period, then the County may, at its election: (a) in writing terminate the Agreement in whole or in part; (b) cure such default itself and charge the Contractor for the costs of curing the default against any sums due or which become due to the Contractor under this Agreement; and/or (c) pursue any other remedy then available, at law or in equity, to the County for such default.

Section 12.  Construction Administration

If a Contract Administrator other than the County has been hired in relation to the Project, the Contract Administrator’s administration of the construction of the Project shall be as described in “Exhibit K”, attached hereto. The Contractor agrees to the construction administration provisions contained in “Exhibit K.”

Section 13.  Miscellaneous

A. Complete Agreement. This Agreement, including all of the Contract Documents, constitutes the complete agreement between the Parties and supersedes any and all other agreements, either oral or in writing, between the Parties with respect to the subject matter of this Agreement. No other agreement, statement, or promise relating to the subject matter of this Agreement not contained in this Agreement or the Contract Documents shall be valid or binding. This Agreement may be modified or amended only by a written document signed by representatives of both Parties with appropriate authorization.

B. Governing Law. This Agreement shall be governed by and construed in accordance with the laws of the State of Georgia without regard to choice of law principles. If any action at law or in equity is brought to enforce or interpret the provisions of this Agreement, the rules, regulations, statutes and laws of the State of Georgia will control. Any action or suit related to this Agreement shall be brought in the Superior Court of Barrow County, Georgia or the U.S. District Court for the Northern District of Georgia – Gainesville Division, and Contractor submits to the jurisdiction and venue of such court.

C. Counterparts. This Agreement may be executed in any number of counterparts, each of which shall be deemed to be an original, but all of which together shall constitute one and the same instrument.

D. Invalidity of Provisions; Severability. Should any article(s) or section(s) of this Agreement, or any part thereof, later be deemed illegal, invalid or unenforceable by a court of competent jurisdiction, the offending portion of the Agreement should be severed, and the remainder of this Agreement shall remain in full force and effect to the extent possible as if this Agreement had been executed with the invalid
portion hereof eliminated, it being the intention of the Parties that they would have executed the remaining portion of this Agreement without including any such part, parts, or portions that may for any reason be hereafter declared invalid.

E. Business License. Prior to commencement of the Work to be provided hereunder, Contractor shall apply to the County for a business license, pay the applicable business license fee, and maintain said business license during the Term of this Agreement, unless Contractor provides evidence that no such license is required.

F. Notices.

(1) Communications Relating to Day-to-Day Activities.

All communications relating to the day-to-day activities of the Work shall be exchanged between Chip McGaughey, P.E., Engineering Management, Inc. for the County and ____________________________ for the Contractor.

(2) Official Notices.

All other notices, requests, demands, writings, or correspondence, as required by this Agreement, shall be in writing and shall be deemed received, and shall be effective, when (1) personally delivered, or (2) on the third calendar day after the postmark date when mailed by certified mail, postage prepaid, return receipt requested, or (3) upon actual delivery when sent via national overnight commercial carrier to the Party at the addresses given below, or at a substitute address previously furnished to the other Party by written notice in accordance herewith:

NOTICE TO COUNTY shall be sent to:

Barrow County
County Manager
Barrow County Historic Courthouse
30 N, Broad Street
Winder, GA 30680

NOTICE TO CONTRACTOR shall be sent to:

____________________
____________________
____________________

G. Waiver of Agreement. No failure by the County to enforce any right or power granted under this Agreement, or to insist upon strict compliance by Contractor with this Agreement, and no custom or practice of the County at variance with the
terms and conditions of this Agreement shall constitute a general waiver of any future breach or default or affect the County’s right to demand exact and strict compliance by Contractor with the terms and conditions of this Agreement. Further, no express waiver shall affect any term or condition other than the one specified in such waiver, and that one only for the time and manner specifically stated.

H. Survival. All sections of this Agreement which by their nature should survive termination will survive termination, including, without limitation, confidentiality obligations, warranties, and insurance maintenance requirements.

I. Sovereign Immunity. Nothing contained in this Agreement shall be construed to be a waiver of the County’s sovereign immunity or any individual’s qualified good faith or official immunities.

J. No Personal Liability. Nothing herein shall be construed as creating any individual or personal liability on the part of any of County’s elected or appointed officials, officers, boards, commissions, employees, representatives, consultants, servants, agents, attorneys or volunteers. No such individual shall be personally liable to the Contractor or any successor in interest in the event of any default or breach by the County or for any amount which may become due to the Contractor or successor or on any obligation under the terms of this Agreement. Likewise, Contractor’s performance of services under this Agreement shall not subject Contractor’s individual employees, officers, or directors to any personal liability, except where Contractor is a sole proprietor. The Parties agree that their sole and exclusive remedy, claim, demand, or suit shall be directed and/or asserted only against Contractor or the County, respectively, and not against any elected or appointed official, officers, boards, commissions, employees, representatives, consultants, servants, agents, attorneys and volunteers.

K. Force Majeure. Neither the County nor Contractor shall be liable for their respective non-negligent or non-willful failure to perform or shall be deemed in default with respect to the failure to perform (or cure a failure to perform) any of their respective duties or obligations under this Agreement or for any delay in such performance due to: (i) any cause beyond their respective reasonable control; (ii) any act of God; (iii) any change in applicable governmental rules or regulations rendering the performance of any portion of this Agreement legally impossible; (iv) earthquake, fire, explosion, or flood; (v) strike or labor dispute, excluding strikes or labor disputes by employees and/or agents of Contractor; (vi) delay or failure to act by any governmental or military authority; or (vii) any war, hostility, embargo, sabotage, civil disturbance, riot, insurrection, or invasion. In such event, the time for performance shall be extended by an amount of time equal to the period of delay caused by such acts, and all other obligations shall remain intact.

L. Headings. All headings herein are intended for convenience and ease of reference purposes only and in no way define, limit, or describe the scope or intent thereof,
or of this Agreement, or in any way affect this Agreement.

M. No Third-Party Rights. This Agreement shall be exclusively for the benefit of the Parties and shall not provide any third parties with any remedy, claim, liability, reimbursement, cause of action or other right.

N. Successors and Assigns. Subject to the provision of this Agreement regarding assignment, each Party binds itself, its partners, successors, assigns, and legal representatives to the other Party hereto, its partners, successors, assigns, and legal representatives with respect to all covenants, agreements, and obligations contained in the Contract Documents.

O. Agreement Construction and Interpretation. Contractor represents that it has reviewed and become familiar with this Agreement. The Parties hereto agree that, if an ambiguity or question of intent or interpretation arises, this Agreement is to be construed as if the Parties had drafted it jointly, as opposed to being construed against a Party because it was responsible for drafting one or more provisions of the Agreement. In the interest of brevity, the Contract Documents may omit modifying words such as “all” and “any” and articles such as “the” and “an,” but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

P. Material Condition. Each term of this Agreement is material, and Contractor’s breach of any term of this Agreement shall be considered a material breach of the entire Agreement and shall be grounds for termination or exercise of any other remedies available to the County at law or in equity.

Q. Use of Singular and Plural. Words or terms used as nouns in the Agreement shall be inclusive of their singular and plural forms, unless the context of their usage clearly requires contrary meaning.

[SIGNATURES ON FOLLOWING PAGE]
IN WITNESS WHEREOF, the County and the Contractor have executed this Agreement effective as of the Effective Date first above written.

CONTRACTOR: ____________________

By: ______________________________________

Print Name: _________________________________

Its: [CIRCLE ONE]
President/Vice President (Corporation)
General Partner (Partnership/Limited Partnership)
Member/Manager (LLC)
Owner (Sole Proprietorship/Individual)

[CORPORATE SEAL]
(required if corporation)

Attest/Witness:

____________________________________________
Print Name: ___________________________________

Its: ______________________________________
((Assistant) Corporate Secretary if corporation)

BARROW COUNTY, GEORGIA

By: _______________________________________

_______________________, Chairman

[COUNTY SEAL]

Attest:

________________________________________
Print Name: ________________________________

Its: County Clerk
“EXHIBIT A”

[INSERT REQUEST FOR PROPOSALS]
“EXHIBIT B”

[INSERT PROPOSAL DOCUMENTS FROM CONTRACTOR]
SCOPE OF SERVICES

Background

The following is a general description of the scope of work for the design and construction of the Tanner’s Bridge WWTF Expansion Project. This scope of work contains the major goals and functional elements of the Project but is not intended to be an all-inclusive list of the scope of work of the Project.

The Tanner’s Bridge WWTF is located at 1113 Briscoe Mill Road, Bethlehem, Georgia 30620 and is in the Oconee River Basin. The existing facility is a 0.50 MGD spray irrigation land application system and operates under LAS Permit Number GAJ020271. The County also has a 5.0 MGD NPDES Permit for the facility under Permit Number GA0039314. A Design Development Report (“2010 DDR”) for the 5.0 MGD plant was completed and approved in March 2010. Due to the economy the 5.0 MGD facility was not constructed and the County now desires to phase the expansion of the facility. The County has obtained a revised Waste Load Allocation from EPD to phase the NPDES permit to 1.0 MGD, 2.0 MGD and 5.0 MGD. EMI has completed a Design Development Report amendment for the phased approach which is currently under review by EPD. The treatment process in the DDR is based on Sequencing Batch Reactor (“SBR”) technology.

Contractor shall provide all engineering, design, construction, and start-up services necessary to complete the expansion of the facility to 1.0 MGD. The existing 0.50 MGD LAS facility will remain in service during and after expansion construction. The Contractor shall be responsible for any and all fines and penalties attributable to the Contractor’s work.

Progressive Design-Build Delivery Services

The Project will follow a Progressive Design-Build (“PDB”) model. The Contractor shall provide services in two distinct phases: Phase 1 services generally consist of reviewing the recently amended DDR and providing recommendations based on the proposed design in the DDR for or against a continuous flow process similar to an oxidation ditch with circular clarifiers. Phase 1 services include preliminary engineering, geotechnical investigations, and preparation in close collaboration with the County and County’s Consultant, of a proposed price and schedule. The proposed price and schedule shall include the Project’s design (developed to the County’s required level of 80% completion), permitting activities, a Guaranteed Maximum Price (“GMP”), Project schedule, and supporting documentation, such as detailed open-book costing for the GMP. Phase 2 services generally encompass completing the Project’s design (100% completion), construction and performance testing.

Phase 1 – Preconstruction Design Phase Services

Phase 1 shall consist of planning, permitting, design, bidding of component packages and preparation of a Guaranteed Maximum Price Proposal. Phase 1 is more specifically described as follows:
• Review Existing DDR and Provide Recommendations – the Contractor shall review the existing DDR prepared by the County’s Consultant titled “Tanner’s Bridge WWTF 1.0 MGD Mechanical Plant Amendment to Tanner’s Bridge Qualifluent 5.0 MGD WRF DDR” and provide any recommendations, including but not limited to the potential costs and operations characteristics of a continuous flow process similar to an oxidation ditch with circular clarifiers, regarding the proposed treatment process, etc.

• Prepare Design Documents – the Contractor shall develop the engineering design (including preparing and submitting intermediate design review packages at 30%, 60% and 80% design completion) and value-engineering activities in conjunction with County’s Consultant. The Contractor shall prepare signed and sealed 80% complete engineering drawings, details, and technical specifications for the Phase 2 construction scope of work. The 80% design package must be prepared and assembled in a manner that provides sufficient technical design information for qualified sub-contractors to prepare competitive bids.

  • Design Meetings and Workshop – the Contractor shall conduct periodic milestone design workshops (i.e., 30%, 60%, and 80% complete) plus periodic meetings with the County and/or EMI to ensure design criteria are being met.

• Project Schedule – the Contractor shall develop and manage a total project schedule using approved scheduling software. Monthly monitoring, updating and reporting are required.

• Permitting – the Contractor shall identify all permits and approvals (environmental, building, local, state, federal, etc.) required to design, construct, and commission the project. Permitting activities must be included in the project schedule. This shall include participation in pre-application meetings, preparation of applications and submittals, responses to requests for additional information (RAI’s) and developing, implementing and monitoring a permit compliance plan.

• Estimate and Constructability Review at 30% Design – the Contractor shall provide an estimate of construction and a constructability review shall be performed after the 30% design package is complete. The Contractor shall meet with the County and EMI to review the estimate and constructability review to determine if the Project is within budget. If the estimate is not within budget, a value engineering workshop will be conducted to align the scope with the budget.

• The Contractor shall coordinate with EMI and County staff regarding the Project design phase and permitting.

• Guaranteed Maximum Price (GMP) Proposal Development – at the 80% design stage, the Contractor shall develop a GMP Proposal through an open book bidding of all work packages for the Project construction (labor, equipment, materials and services) with the exclusion of any sole-sourced equipment as defined during the design of the Project.

  • The GMP shall also include all other direct costs the Contractor may encounter.
including general condition costs, costs of bonds and insurance, overhead and profit for all work under the construction phase, Owner-controlled contingencies (which contingencies, if any, shall be for the County’s use and benefit), field management costs, and any allowances.

• GMP Proposal – If a GMP cannot be agreed upon, the County will retain all of the deliverables obtained during the Phase 1 of the Project and may use them to re-advertise the Project for construction bids or proposals. If a GMP is accepted by the County, a GMP Amendment will be executed by the County and the Contractor in the amount of the agreed GMP for the construction of the scope of work outlined in the design documents.

Phase 2 – Construction Phase Services

Phase 2 shall consist of construction services as described below:

• Contractor shall complete the final design of the Project (100% complete).

• Contractor shall procure all equipment and subcontractors – all work shall be broken down into various acquisition packages and procured with input from the County and County’s Consultant on equipment and systems. Cost shall not be the only determining factor in selection of these packages but among the factors that will be considered will be quality, performance, and expected reliability. The Contractor shall not be prohibited from bidding to self-perform any of the packages if Contractor is qualified and properly licensed to do such work.

• Construction Services – the Contractor shall provide management and administration of the construction phase obligations as defined herein. Construction phase scope of work shall include monthly progress/construction meetings; management of subcontractors (contracts, insurance, and bonds); preparation of payment requests; shop drawings and equipment Operations & Maintenance (O&M) Manual submittal and tracking; tracking of Request for Information and/or clarifications (RFI’s); document filing and storage; preparation of record drawings; facility training, start-up and commissioning; Project close-out; and warranty administration through the warranty period.

• Project Schedule – the Contractor shall develop and manage a construction phase schedule using approved scheduling software. Monthly monitoring, updating and reporting are required.

• Project Budget Reporting – the Contractor shall prepare a project construction budget and monthly monitoring, updating and reporting. Cash flow projections are also required for the construction phase of the Project.

• Permitting – the Contractor shall track permit compliance, all required regulatory notifications and reporting, proper closeout and/or transfer to the operational phase and receipt of certificate of occupancy.
• Contractor shall conduct start-up, commissioning and performance testing.
• Contractor shall provide operator training.
• Contractor shall provide warranty coverage.

Permits

All anticipated permits for the Project have not been obtained. The following is a list of anticipated permits and their status/responsibility:

• EPD Approval of the Design Development Report – The DDR is currently under review by EPD.
• Land Disturbance Permit – The PDB Contractor shall obtain prior to construction.
• Buffer Variance – If a buffer variance is required for the construction of the discharge point, the Contractor shall prepare and submit the application on behalf of the County.
• US Army Corps of Engineers Permit – If a COE Permit is required for the construction of the discharge point, the Contractor shall prepare and submit the application on behalf of the County.
• NPDES Permit – The County’s Consultant will assist the County with modification of the existing NPDES permit prior to construction completion.
• Electrical Permit – The Contractor shall obtain electrical permits if required by County.
• Plumbing Permit – The Contractor shall obtain plumbing permits if required by County.
• EPD Approval of Plans and Specifications – The Contractor shall obtain EPD approval of plans and specifications.

Desired Outcomes

The following provides a brief narrative of the required outcomes of the Project:

A. Effluent Quality & Quantity

1. Meet proposed Waste Load Allocation, the NPDES discharge permit requirements to be issued for the expanded plant, and the requirements in the Appendices.
2. Flows (Provide plant capacity of 1.0 MGD Average Monthly Flow).
3. Perform all necessary investigation into influent loadings and additional sampling.
4. Evaluate and implement sludge handling, treatment, dewatering, and disposal methods.
B. Guarantees

6. Refer also to Appendix 1 and 11.

7. Noise
   b. Noise levels of various equipment shall be considered and discussed during the design phase.

8. Odor
   b. Odors from various treatment processes shall be considered and discussed during the design phase.

9. Life Cycle and Operating Usages and Costs
   e. Power consumption
   f. Chemical consumption
   g. Cost of operation
   h. Other items which may be applicable to evaluate a design.

10. Treatment guarantees
    c. Whole effluent quality.
    d. Process level treatment, which may include:
       5) Screenings and grit removal efficiency
       6) Dewatering performance
       7) Power used to complete nitrification
       8) Other

C. Mitigation of impact to the neighbors

1. See Noise and Odor guarantees above.

2. The Contractor shall take all reasonable precautions and considerations into the design and construction of the Project to minimize negative impacts to abutting property owners including but not limited to Site Lighting, Architecture, and Landscaping.

D. Property and existing facilities

1. A new entrance at the facility at Tanner’s Bridge Road shall be included in the design and construction for ingress/egress including safety and security enhancements.

E. Direction on equipment and processes

1. Equipment and system type preferences shall be determined during Phase 1, including requirements for redundancy.

F. Other items

1. The design and construction shall properly address site and building security for the
entire facility as expanded.

2. The design and construction of the Project shall comply with any applicable stormwater provisions and requirements of County, state, and any other applicable law.

Appendices Incorporated Herein

For additional specificity regarding the Scope of Services required hereunder, please see the Appendices 1 – 10 attached at Exhibit A (County’s RFQP) above.
“EXHIBITS D.1 AND D.2”
“EXHIBIT D.1”

PERFORMANCE BOND

BARROW COUNTY

KNOW ALL MEN BY THESE PRESENTS THAT _____________________________

(as CONTRACTOR, hereinafter referred to as the “Principal”), and _____________________

(as SURETY COMPANY, hereinafter referred to as the “CONTRACTOR’S SURETY”), are held

and firmly bound unto Barrow County, Georgia (as OWNER, hereinafter referred to as the

“County”), for the use and benefit of the County, in the sum of

_____________________________ Dollars ($________.__), lawful money of the United States

of America, for the payment of which the Principal and the Contractor’s Surety bind themselves,

their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these

presents.

WHEREAS, the Principal has entered, or is about to enter, into a certain written agreement

with the County for the construction of a project known as

_______________________________________________ (hereinafter referred to as “the

PROJECT”), which agreement is incorporated herein by reference in its entirety (hereinafter

referred to as the “CONTRACT”).

NOW THEREFORE, the conditions of this obligation are as follows:

1. That if the Principal shall fully and completely perform each and all of the terms, provisions

and requirements of the Contract, including and during the period of any warranties or

guarantees required thereunder, and all modifications, amendments, changes, deletions,

additions, and alterations thereto that may hereafter be made, and if the Principal and the

Contractor’s Surety shall indemnify and hold harmless the County from any and all losses,
liability and damages, claims, judgments, liens, costs and fees of every description, including but not limited to, any damages for delay, which the County may incur, sustain or suffer by reason of the failure or default on the part of the Principal in the performance of any and all of the terms, provisions, and requirements of the Contract, including all modifications, amendments, changes, deletions, additions, and alterations thereto, and any warranties or guarantees required thereunder, then this obligation shall be void; otherwise to remain in full force and effect;

2. In the event of a failure of performance of the Contract by the Principal, which shall include, but not be limited to, any breach or default of the Contract:
   a. The Contractor’s Surety shall commence performance of its obligations and undertakings under this Bond no later than thirty (30) calendar days after written notice from the County to the Contractor’s Surety; and
   b. The means, method or procedure by which the Contractor’s Surety undertakes to perform its obligations under this Bond shall be subject to the advance written approval of the County.

The Contractor’s Surety hereby waives notice of any and all modifications, omissions, additions, changes, and advance payments or deferred payments in or about the Contract, and agrees that the obligations undertaken by this Bond shall not be impaired in any manner by reason of any such modifications, omissions, additions, changes, and advance payments or deferred payments. The Parties further expressly agree that any action on this Bond may be brought within the time allowed by Georgia law for suit on contracts under seal.

IN WITNESS WHEREOF, the Principal and Contractor’s Surety have hereunto affixed their corporate seals and caused this obligation to be signed by their duly authorized officers or
attorneys-in-fact, as set forth below.

CONTRACTOR ("Principal"):

_________________________

By: ________________________ (signature)

__________________________ (print)

Title: ________________________ (SEAL)

Date: ________________________

Attest:

__________________________ (signature)

__________________________ (print)

Title: ________________________

Date: ________________________

CONTRACTOR'S SURETY:

_________________________

By: ________________________ (signature)

__________________________ (print)

Title: ________________________ (SEAL)

Date: ________________________

Attest:

__________________________ (signature)

__________________________ (print)

Title: ________________________

Date: ________________________

(ATTACH SURETY’S POWER OF ATTORNEY)
“EXHIBIT D.2”

PAYMENT BOND

BARROW COUNTY

KNOW ALL MEN BY THESE PRESENTS THAT ____________________________ (as CONTRACTOR, hereinafter referred to as the “Principal”), and ______________________ (as SURETY COMPANY, hereinafter referred to as the “CONTRACTOR’S SURETY”), are held and firmly bound unto Barrow County, Georgia (as OWNER, hereinafter referred to as the “County”), for the use and benefit of any “Claimant,” as hereinafter defined, in the sum of ____________________________ Dollars ($_______.__), lawful money of the United States of America, for the payment of which the Principal and the Contractor’s Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered, or is about to enter, into a certain written agreement with the County for the construction of a project known as ____________________________ (hereinafter referred to as “the PROJECT”), which agreement is incorporated herein by reference in its entirety (hereinafter referred to as the “CONTRACT”).

NOW THEREFORE, the condition of this obligation is such that if the Principal shall promptly make payment to any Claimant, as hereinafter defined, for all labor, services, and materials used or reasonably required for use in the performance of the Contract, then this obligation shall be void; otherwise to remain in full force and effect.

A “Claimant” shall be defined herein as any Subcontractor, person, Party, partnership, corporation, or other entity furnishing labor, services, or materials used or reasonably required for
use in the performance of the Contract, without regard to whether such labor, services, or materials were sold, leased, or rented, and without regard to whether such Claimant is or is not in privity of the Contract with the Principal or any Subcontractor performing Work on the Project.

In the event of any claim made by the Claimant against the County, or the filing of a Lien against the property of the County affected by the Contract, the Contractor’s Surety shall either settle or resolve the Claim and shall remove any such Lien by bond or otherwise as provided in the Contract.

The Parties further expressly agree that any action on this Bond may be brought within the time allowed by Georgia law for suit on contracts under seal.

**IN WITNESS WHEREOF,** the Principal and Contractor’s Surety have hereunto affixed their corporate seals and caused this obligation to be signed by their duly authorized officers, as set forth below.

[SIGNATURES ON FOLLOWING PAGE]
CONTRACTOR:

______________________________

By: __________________________ (signature)

__________________________ (printed)

Title: __________________________ (SEAL)

Date: __________________________

Attest:

__________________________ (signature)

__________________________ (printed)

Title: __________________________

Date: __________________________

CONTRACTOR’S SURETY:

______________________________

By: __________________________ (signature)

__________________________ (printed)

Title: __________________________ (SEAL)

Date: __________________________

Attest:

__________________________ (signature)

__________________________ (printed)

Title: __________________________

Date: __________________________

(ATTACH SURETY’S POWER OF ATTORNEY)
STATE OF ____________________
COUNTY OF _____________

___________________________, being first duly sworn, deposes and says that:

(1) He is ___________________________ (e.g., Owner, Partner, Officer, Representative, or Agent) of _____________________________ (the “Proposer”) that has submitted the attached Proposal;

(2) He is fully informed respecting the preparation and contents of the attached Proposal and of all pertinent circumstances respecting such Proposal;

(3) Such Proposal is genuine and is not a collusive of sham Proposal;

(4) Neither the said Proposer nor any of its officers, partners, owners, agents, representatives, employees, or parties in interest, included in this affidavit, has in any way colluded, conspired, connived, or agreed, directly or indirectly, with any other proposer, firm or person to submit a collusive or sham Proposal in connection with the Contract for which the attached Proposal has been submitted or to refrain from proposing in connection with such Contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other proposer, firm or person to fix the price or prices in the attached Proposal or of any other proposer, or to fix any overhead, profit or cost element of the proposal price of any other proposer or to secure through any collusion, conspiracy, connivance, or unlawful agreement any advantage against Barrow County or any person interested in the proposed Contract; and,

(5) The price or prices quoted in the attached Proposal are fair and proper and are not tainted by any collusion, conspiracy, connivance, or unlawful agreement on the part of the Proposer or any of its agents, representatives, owners, employees, or parties in interest, including this Affiant.

(6) Proposer has not directly or indirectly violated any law, ordinance or regulation related to the Proposal.

___________________________
Signature of Authorized Officer or Agent

SUBSCRIBED AND SWORN BEFORE ME ON THIS THE _______ DAY OF ____________, 2019.

___________________________
Notary Public

[NOTARY SEAL]

My Commission Expires:
“EXHIBIT F”

FINAL AFFIDAVIT

STATE OF __________________
COUNTY OF ________________

TO BARROW COUNTY, GEORGIA

I, _______________________________, hereby certify that all suppliers of materials, equipment and service, subcontractors, mechanics, and laborers employed by __________________________ or any of its subcontractors in connection with the construction of ______________________________ for Barrow County, Georgia have been paid and satisfied in full as of ______________, 2019, and that there are no outstanding obligations or claims of any kind for the payment of which Barrow County, Georgia on the above named project might be liable, or subject to, in any lawful proceeding at law or in equity.

________________________________________
Signature

________________________________________
Title

Personally appeared before me this ____ day of ________, 2019, ________________________, who under oath deposes and says that he is ____________________ __________ of the firm of _______________________________, that he has read the above statement, and that to the best of his knowledge and belief same is an exact true statement.

________________________________________
Notary Public

[NOTARY SEAL]

My Commission Expires

________________________________________
STATE OF __________________
COUNTY OF __________________

CONTRACTOR AFFIDAVIT AND AGREEMENT

By executing this affidavit, the undersigned contractor verifies its compliance with O.C.G.A. § 13-10-91, stating affirmatively that the individual, firm, or corporation which is engaged in the physical performance of services on behalf of Barrow County has registered with, is authorized to use, and uses the federal work authorization program commonly known as E-Verify, or any subsequent replacement program, in accordance with the applicable provisions and deadlines established in O.C.G.A. § 13-10-91.

Furthermore, the undersigned contractor will continue to use the federal work authorization program throughout the contract period, and the undersigned contractor will contract for the physical performance of services in satisfaction of such contract only with subcontractors who present an affidavit to the contractor with the information required by O.C.G.A. § 13-10-91(b).

Contractor hereby attests that its federal work authorization user identification number and date of authorization are as follows:

_______________________________________
Federal Work Authorization User Identification Number

_______________________________________
Date of Authorization

_______________________________________
Name of Contractor

_______________________________________
Name of Project

_______________________________________
Name of Public Employer

I hereby declare under penalty of perjury that the foregoing is true and correct. Executed on ________, 2019 in ________ (city), ________ (state).

_______________________________________
Signature of Authorized Officer or Agent

_______________________________________
Printed Name and Title of Authorized Officer or Agent

SUBSCRIBED AND SWORN BEFORE ME ON THIS THE ________ DAY OF ________, 2019.

_______________________________________
Notary Public

[NOTARY SEAL]

My Commission Expires:
"EXHIBIT G.2"

SUBCONTRACTOR AFFIDAVIT

STATE OF ___________________
COUNTY OF _______________

By executing this affidavit, the undersigned subcontractor verifies its compliance with O.C.G.A. § 13-10-91, stating affirmatively that the individual, firm or corporation which is engaged in the physical performance of services under a contract with _________________________ (name of contractor) on behalf of Barrow County has registered with, is authorized to use, and uses the federal work authorization program commonly known as E-Verify, or any subsequent replacement program, in accordance with the applicable provisions and deadlines established in O.C.G.A. § 13-10-91. Furthermore, the undersigned subcontractor will continue to use the federal work authorization program throughout the contract period, and the undersigned subcontractor will contract for the physical performance of services in satisfaction of such contract only with sub-subcontractors who present an affidavit to the subcontractor with the information required by O.C.G.A. § 13-10-91(b). Additionally, the undersigned subcontractor will forward notice of the receipt of an affidavit from a sub-subcontractor to the contractor within five (5) business days of receipt. If the undersigned subcontractor receives notice that a sub-subcontractor has received an affidavit from any other contracted sub-subcontractor, the undersigned subcontractor must forward, within five (5) business days of receipt, a copy of the notice to the contractor.

Subcontractor hereby attests that its federal work authorization user identification number and date of authorization are as follows:

Federal Work Authorization User Identification Number

Date of Authorization

Name of Subcontractor

Name of Project

Barrow County, Georgia

Name of Public Employer

I hereby declare under penalty of perjury that the foregoing is true and correct.

Executed on _______ ___, 20__ in _____(city), _____ (state).

Signature of Authorized Officer or Agent

Printed Name and Title of Authorized Officer or Agent

SUBSCRIBED AND SWORN BEFORE ME ON THIS THE ______ DAY OF _____________, 20__.

NOTARY PUBLIC

[NOTARY SEAL]

My Commission Expires:
“EXHIBIT H”

APPROVED PROJECT PLANS, DRAWINGS AND SPECIFICATIONS

*To be developed during Phase 1 of the Scope of Services and updated/amended following completion of Phase 2 of the Scope of Services. See Exhibits A, B, and C above for additional information and specification.
“EXHIBIT I”

ADDITIONAL PAYMENT TERMS

A. Defined Terms. Terms used in this Agreement shall have their ordinary meaning, unless otherwise defined below or elsewhere in the Contract Documents.

(i) “Substantial Completion” means when the Work or designated portion thereof is complete in accordance with the Contract Documents so that any remaining Work includes only (1) Minor Items that can be completed or corrected within the following thirty (30) calendar days, (2) Permitted Incomplete Work that will be completed by the date agreed upon by the Parties, and (3) any Warranty Work. Substantial Completion shall require complete operation of all applicable building systems including, but not limited to, mechanical, electrical, plumbing, fire protection, fire alarm, telecom, data, security, elevators, life safety, and accessibility (if any).

(ii) “Minor Item” means a portion or element of the Work that can be totally complete within thirty (30) calendar days.

(iii) “Permitted Incomplete Work” means Work that is incomplete through no fault of the Contractor, as determined by the County in its sole discretion.

(iv) “Final Completion” means when the Work has been completed in accordance with terms and conditions of the Contract Documents.

B. Payment for Work Completed and Costs Incurred. County agrees to pay the Contractor for the Work performed and costs incurred by Contractor upon certification by the Contract Administrator and the County that the Work was actually performed and costs actually incurred in accordance with this Agreement. Payment shall be based on the value of the Work completed, as provided in the Contract Documents, plus the value of materials and equipment suitably stored, insured, and protected at the construction site, and, only if approved in writing by the County (which approval shall be given at the sole discretion of the County), such materials and equipment suitably stored, insured, and protected off site at a location approved by the County in writing, less retainage (as described below). Compensation for Work performed and reimbursement for costs incurred shall be paid to the Contractor upon receipt and approval by the County of invoices setting forth in detail the Work performed and costs incurred, along with all supporting documents required by the Contract Documents or requested by the County to process the invoice. Invoices shall be submitted on a monthly basis, and such invoices shall reflect costs incurred versus costs budgeted. Each invoice shall be accompanied by an Interim Waiver and Release upon Payment (or a Waiver and Release upon Final Payment in the case of the invoice for final payment) procured by the Contractor from all subcontractors in accordance with O.C.G.A. § 44-14-366.

The County shall pay the Contractor within thirty (30) calendar days after approval of the invoice by County staff, less any retainage as described in Section D below. No payments will be made
for unauthorized work. Payment will be sent to the designated address by U. S. Mail only; payment will not be hand-delivered, though the Contractor may arrange to pick up payments directly from the County or may make written requests for the County to deliver payments to the Contractor by Federal Express delivery at the Contractor’s expense.

C. Evaluation of Payment Requests. The Contract Administrator will evaluate the Contractor’s applications for payment and will either issue to the County a Certificate for Payment (with a copy of the Contractor’s application for payment) for such amount as the Contract Administrator determines is properly due, or notify the Contractor and County in writing of the Contract Administrator’s reasons for withholding certification in whole or in part. The Contract Administrator may reject Work that does not conform to the Contract Documents and may withhold a Certificate of Payment in whole or in part, to the extent reasonably necessary to protect the County. When the reasons for withholding certification are removed, certification will be made for amounts previously withheld.

Even following a Certificate of Payment, the County shall have the right to refuse payment of any invoice or part thereof that is not properly supported, or where requests for payment for Work or costs are in excess of the actual Work performed or costs incurred, or where the Work product provided is unacceptable or not in conformity with the Contract Documents, as determined by the County in its sole discretion. The County shall pay each such invoice or portion thereof as approved, provided that neither the approval or payment of any such invoice, nor partial or entire use or occupancy of the Project by the County, shall be considered to be evidence of performance by the Contractor to the point indicated by such invoice, or of receipt or acceptance by the County of Work covered by such invoice, where such work is not in accordance with the Contract Documents.

D. Final Payment and Retainage. The County and Contractor shall comply with the provisions of O.C.G.A. § 13-10-81. During the Phase 1 portion of the work the Contractor may request payment for the amount or percentage (%) of Phase 1 work completed. No retainage will be held during Phase 1. For the Phase 2 portion of the work the Contractor through each invoice may request payment of no more than ninety percent (90%) of the gross value of the Work completed during the term covered by such invoice until fifty percent (50%) of the Maximum Contract Price, as may be adjusted, is due and the manner of completion of the Work and its progress are reasonably satisfactory to the County. Payment for the remaining ten percent (10%) of Work completed and covered by such invoices shall be retained by the County until Substantial Completion. Once fifty percent (50%) of the Maximum Contract Price, as may be adjusted, is due and the manner of completion of the Work and its progress are reasonably satisfactory to the County, no additional retainage shall be withheld, except as provided below. All amounts retained by the County shall be held as a lump sum until Substantial Completion of the Work, regardless of earlier completion of individual component(s) of the Work; provided, however, that, at the discretion of the County and with the written approval of the Contractor, the retainage of each subcontractor may be released separately as the subcontractor completes his or her work. Retainage shall be invested at the current market rate, and any interest earned on the retained amount by the County shall be paid to the Contractor when the Project has been completed within the time limits specified and within
the Maximum Contract Price (as amended).

If, after discontinuing the retention, the County determines that the Work is unsatisfactory or has fallen behind schedule, retention may be resumed at the previous level. If retention is resumed by the County, the Contractor and subcontractors shall be entitled to resume withholding retainage accordingly. At Substantial Completion of the Work and as the Contract Administrator determines the Work to be reasonably satisfactory, the County shall, within 30 days after the invoice and other appropriate documentation as may be required by the Contract Documents are provided to the County, pay the retainage to the Contractor. If at that time there are any remaining incomplete Minor Items or Permitted Incomplete Work, an amount equal to 200 percent of the value of each Minor Item or Permitted Incomplete Work, as determined by the Contract Administrator in its sole discretion, shall be withheld until such item, items or work are completed. The reduced retainage shall be shared by the Contractor and subcontractors as their interests may appear.

The Contractor shall, within ten (10) days from its receipt of retainage from the County, pass through payments to subcontractors and shall reduce each subcontractor’s retainage in the same manner as the Contractor’s retainage is reduced by the County; provided, however, that the value of each subcontractor’s work complete and in place equals fifty percent (50%) of his or her subcontract value, including approved Change Orders and other additions to the subcontract value; provided, further, that the work of the subcontractor is proceeding satisfactorily and the subcontractor has provided or provides such satisfactory reasonable assurances of continued performance and financial responsibility to complete his or her work including any warranty work as the Contractor in his or her reasonable discretion may require, including, but not limited to, a payment and performance bond. The subcontractor shall, within ten (10) days from the subcontractor’s receipt of retainage from the Contractor, pass through payments to lower tier subcontractors and shall reduce each lower tier subcontractor’s retainage in the same manner as the subcontractor’s retainage is reduced by the Contractor; provided, however, that the value of each lower tier subcontractor’s work complete and in place equals fifty percent (50%) of his or her subcontract value, including approved Change Orders and other additions to the subcontract value; provided, further, that the work of the lower tier subcontractor is proceeding satisfactorily and the lower tier subcontractor has provided or provides such satisfactory reasonable assurances of continued performance and financial responsibility to complete his or her work including any warranty work as the subcontractor in his or her reasonable discretion may require, including, but not limited to, a payment and performance bond.

Final payment of any retained amounts to the Contractor shall be made after certification by the Contract Administrator that the Work has been satisfactorily completed and is accepted in accordance with the Agreement and Contract Documents. Payment to the Contractor of interest earned on the retained amounts shall be made after certification by the Contract Administrator that the Work has been completed within the time specified and within the Maximum Contract Price.
Neither final payment nor any remaining retainage shall become due until the Contractor submits to the Contract Administrator (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the County or County property might be responsible or encumbered (less amounts withheld by County) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance, required by the Contract Documents to remain in force after final payment, is currently in effect and will not be canceled or allowed to expire until at least 30 calendar days prior written notice has been given to the County; (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) a release or waiver of liens, claims, security interests, and encumbrances by all subcontractors and material suppliers, and (6), if required by the County, other data establishing payment or satisfaction of obligations, such as receipts, to the extent and in such form as may be designated by the County. If a subcontractor or material supplier refuses to furnish a release or waiver as required by the County, the Contractor may furnish a bond satisfactory to the County to indemnify the County against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the County all money that the County may be compelled to pay in discharging such lien, including all costs and reasonable attorneys’ fees.

Acceptance of final payment by the Contractor, a subcontractor or material supplier shall constitute a waiver of claims by that payee, except those claims previously made in writing and identified by that payee as unsettled at the time of final application for payment.
“EXHIBIT J”

KEY PERSONNEL

The following individuals are designated as Key Personnel under this Agreement and, as such, are necessary for the successful prosecution of the Work:

<table>
<thead>
<tr>
<th>Individual</th>
<th>Position</th>
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<tbody>
<tr>
<td></td>
<td>____________, Project Manager</td>
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“EXHIBIT K”

CONTRACT ADMINISTRATION

Engineering Management, Inc. (“EMI”) is the County’s Contract Administrator.

A. Communications. Except as otherwise provided in the Contract Documents or when direct communications have been specifically authorized, the County and the Contractor shall endeavor to communicate with each other through the Contract Administrator about matters arising out of or relating to the Agreement. The Contract Administrator’s decisions in matters relating to aesthetic effect shall be final if consistent with the intent of this Agreement.

B. Submittals. The Contract Administrator will review and approve or take other appropriate action upon the Contractor’s submittals, such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

C. Contractor Responsibilities Unchanged. The duties, obligations, and responsibilities of the Contractor under this Agreement shall in no manner whatsoever be changed, altered, discharged, released, or satisfied by any duty, obligation, or responsibility of the Contract Administrator, architect, engineer or any other party hired by the County. The Contractor is not a third-party beneficiary of any Agreement by and between the County and any other party. It is expressly acknowledged and agreed that the duties of the Contractor to the County are independent of, and are not diminished by, any duties of the Contract Administrator, architect, engineer or any other party to the County.
A. Contractor’s Services and Responsibilities

1. General Services.

1.1 Contractor’s Representative shall be reasonably available to Owner and shall have the necessary expertise and experience required to supervise the Work. Contractor’s Representative shall communicate regularly with Owner and shall be vested with the authority to act on behalf of Contractor. Contractor’s Representative may be replaced only with the mutual agreement of Owner and Contractor.

1.2 Contractor shall provide Owner with a monthly status report detailing the progress of the Work, including (i) whether the Work is proceeding according to schedule, (ii) whether discrepancies, conflicts, or ambiguities exist in the Contract Documents that require resolution, (iii) whether health and safety issues exist in connection with the Work; (iv) status of the contingency account to the extent provided for in the Agreement; and (v) other items that require resolution so as not to jeopardize Contractor’s ability to complete the Work for the Contract Price and within the Contract Time(s).

1.3 Unless a schedule for the execution of the Work has been attached to the Agreement as an exhibit at the time the Agreement is executed, Contractor shall prepare and submit, at least three (3) days prior to the meeting contemplated by subsection 1.4 below, a schedule for the execution of the Work for Owner’s review and response. The schedule shall indicate the dates for the start and completion of the various stages of Work, including the dates when Owner information and approvals are required to enable Contractor to achieve the Contract Time(s). The schedule shall be revised as required by conditions and progress of the Work, but such revisions shall not relieve Contractor of its obligations to complete the Work within the Contract Time(s), as such dates may be adjusted in accordance with the Contract Documents. Owner’s review of, and response to, the schedule shall not be construed as relieving Contractor of its complete and exclusive control over the means, methods, sequences and techniques for executing the Work.

1.4 The parties will meet within seven (7) days after execution of the Agreement to discuss issues affecting the administration of the Work and to implement the necessary procedures, including those relating to submittals and payment, to facilitate the ability of the parties to perform their obligations under the Contract Documents.

2. Design Professional Services.

2.1 Contractor shall, consistent with applicable state licensing laws, provide through qualified, licensed design professionals employed by Contractor, or procured from qualified, independent licensed Design Consultants, the necessary design services, including architectural, engineering and other design professional services, for the preparation of the required drawings, specifications and other design submittals to permit
Contractor to complete the Work consistent with the Contract Documents. Nothing in the Contract Documents is intended or deemed to create any legal or contractual relationship between Owner and any Design Consultant.

3. **Standard of Care for Design Professional Services.**

   3.1 The standard of care for all design professional services performed to execute the Work shall be the care and skill ordinarily used by members of the design profession practicing under similar conditions at the same time and locality of the Project.

4. **Design Development Services.**

   4.1 Contractor and Owner shall, consistent with any applicable provision of the Contract Documents, agree upon any interim design submissions that Owner may wish to review, which interim design submissions may include design criteria, drawings, diagrams and specifications setting forth the Project requirements. Minutes of the meetings, including a full listing of all changes, will be maintained by Contractor and provided to all attendees for review. Following the design review meeting, Owner shall review and approve the interim design submissions and meeting minutes in a time that is consistent with the turnaround times set forth in Contractor’s schedule.

   4.2 Contractor shall submit to Owner Construction Documents setting forth in detail drawings and specifications describing the requirements for construction of the Work. The Construction Documents shall be consistent with the latest set of interim design submissions, as such submissions may have been modified in a design review meeting and recorded in the meetings minutes. The parties shall have a design review meeting to discuss, and Owner shall review and approve, the Construction Documents in accordance with the procedures set forth in subsection 4.1 above. Contractor shall proceed with construction in accordance with the approved Construction Documents and shall submit one set of approved Construction Documents to Owner prior to commencement of construction.

   4.3 Owner’s review and approval of interim design submissions, meeting minutes, and the Construction Documents is for the purpose of mutually establishing a conformed set of Contract Documents compatible with the requirements of the Work. Neither Owner’s review nor approval of any interim design submissions, meeting minutes, and Construction Documents shall be deemed to transfer any design liability from Contractor to Owner.

   4.4 To the extent not prohibited by the Contract Documents or Legal Requirements, Contractor may prepare interim design submissions and Construction Documents for a portion of the Work to permit construction to proceed on that portion of the Work prior to completion of the Construction Documents for the entire Work.

5. **Legal Requirements.**

   5.1 Contractor shall perform the Work in accordance with all Legal Requirements and shall provide all notices applicable to the Work as required by the Legal Requirements.
5.2 The Contract Price and/or Contract Time(s) shall be adjusted to compensate Contractor for the effects of any changes in the Legal Requirements enacted after the date of the Agreement affecting the performance of the Work, or if a Guaranteed Maximum Price is established after the date of the Agreement, the date the parties agree upon the Guaranteed Maximum Price. Such effects may include, without limitation, revisions Contractor is required to make to the Construction Documents because of changes in Legal Requirements.


6.1 Except as identified in an Owner’s Permit List in or attached as an exhibit to the Agreement, Contractor shall obtain and pay for all necessary permits, approvals, licenses, government charges and inspection fees required for the prosecution of the Work by any government or quasi-government entity having jurisdiction over the Project.

6.2 Contractor shall provide reasonable assistance to Owner in obtaining those permits, approvals and licenses that are Owner’s responsibility.

7. Contractor’s Construction Phase Services.

7.1 Unless otherwise provided in the Contract Documents to be the responsibility of Owner or a separate contractor, Contractor shall provide through itself or Subcontractors the necessary supervision, labor, inspection, testing, start-up, material, equipment, machinery, temporary utilities and other temporary facilities to permit Contractor to complete construction of the Project consistent with the Contract Documents.

7.2 Contractor shall perform all construction activities efficiently and with the requisite expertise, skill and competence to satisfy the requirements of the Contract Documents. Contractor shall at all times exercise complete and exclusive control over the means, methods, sequences and techniques of construction.

7.3 Contractor shall employ only Subcontractors who are duly licensed and qualified to perform the Work consistent with the Contract Documents. Owner may reasonably object to Contractor’s selection of any Subcontractor, provided that the Contract Price and/or Contract Time(s) shall be adjusted to the extent that Owner’s decision impacts Contractor’s cost and/or time of performance.

7.4 Contractor assumes responsibility to Owner for the proper performance of the Work of Subcontractors and any acts and omissions in connection with such performance. Nothing in the Contract Documents is intended or deemed to create any legal or contractual relationship between Owner and any Subcontractor or Sub-Subcontractor, including but not limited to any third-party beneficiary rights.

7.5 Contractor shall coordinate the activities of all Subcontractors. If Owner performs other work on the Project or at the Site with separate contractors under Owner’s control, Contractor agrees to reasonably cooperate and coordinate its activities with those of such separate contractors so that the Project can be completed in an orderly and coordinated manner without unreasonable disruption.
7.6 Contractor shall keep the Site reasonably free from debris, trash and construction wastes to permit Contractor to perform its construction services efficiently, safely and without interfering with the use of adjacent land areas. Upon Substantial Completion of the Work, or a portion of the Work, Contractor shall remove all debris, trash, construction wastes, materials, equipment, machinery and tools arising from the Work or applicable portions thereof to permit Owner to occupy the Project or a portion of the Project for its intended use.


8.1 Contractor recognizes the importance of performing the Work in a safe manner so as to prevent damage, injury or loss to (i) all individuals at the Site, whether working or visiting, (ii) the Work, including materials and equipment incorporated into the Work or stored on-Site or off-Site, and (iii) all other property at the Site or adjacent thereto. Contractor assumes responsibility for implementing and monitoring all safety precautions and programs related to the performance of the Work. Contractor shall, prior to commencing construction, designate a Safety Representative with the necessary qualifications and experience to supervise the implementation and monitoring of all safety precautions and programs related to the Work. Unless otherwise required by the Contract Documents, Contractor’s Safety Representative shall be an individual stationed at the Site who may have responsibilities on the Project in addition to safety. The Safety Representative shall make routine daily inspections of the Site and shall hold weekly safety meetings with Contractor’s personnel, Subcontractors and others as applicable.

8.2 Contractor and Subcontractors shall comply with all Legal Requirements relating to safety, as well as any Owner-specific safety requirements set forth in the Contract Documents, provided that such Owner-specific requirements do not violate any applicable Legal Requirement. Contractor will immediately report in writing any safety-related injury, loss, damage or accident arising from the Work to Owner’s Representative and, to the extent mandated by Legal Requirements, to all government or quasi-government authorities having jurisdiction over safety-related matters involving the Project or the Work.

8.3 Contractor’s responsibility for safety under this Section 8 is not intended in any way to relieve Subcontractors and Sub-Subcontractors of their own contractual and legal obligations and responsibility for (i) complying with all Legal Requirements, including those related to health and safety matters, and (ii) taking all necessary measures to implement and monitor all safety precautions and programs to guard against injuries, losses, damages or accidents resulting from their performance of the Work.

9. Contractor’s Warranty.

9.1 Contractor warrants to Owner that the construction, including all materials and equipment furnished as part of the construction, shall be new unless otherwise specified in the Contract Documents, of good quality, in conformance with the Contract Documents and free of defects in materials and workmanship. Contractor’s warranty obligation excludes defects caused by abuse, alterations, or failure to maintain the Work in a
commercially reasonable manner. Nothing in this warranty is intended to limit any manufacturer’s warranty which provides Owner with greater warranty rights than set forth in this Section 9 or the Contract Documents. Contractor will provide Owner with all manufacturers’ warranties upon Substantial Completion.

10. **Correction of Defective Work.**

10.1 Contractor agrees to correct any Work that is found to not be in conformance with the Contract Documents, including that part of the Work subject to Section 9 hereof, within a period of one year from the date of Substantial Completion of the Work or any portion of the Work, or within such longer period to the extent required by any specific warranty included in the Contract Documents.

10.2 Contractor shall, within seven (7) days of receipt of written notice from Owner that the Work is not in conformance with the Contract Documents, take meaningful steps to commence correction of such nonconforming Work, including the correction, removal or replacement of the nonconforming Work and any damage caused to other parts of the Work affected by the nonconforming Work. If Contractor fails to commence the necessary steps within such seven (7) day period, Owner, in addition to any other remedies provided under the Contract Documents, may provide Contractor with written notice that Owner will commence correction of such nonconforming Work with its own forces. If Owner does perform such corrective Work, Contractor shall be responsible for all reasonable costs incurred by Owner in performing such correction. If the nonconforming Work creates an emergency requiring an immediate response, the seven (7) day period identified herein shall be deemed inapplicable.

10.3 The one-year period referenced in subsection 10.1 above applies only to Contractor’s obligation to correct nonconforming Work and is not intended to constitute a period of limitations for any other rights or remedies Owner may have regarding Contractor’s other obligations under the Contract Documents.

B. Owner’s Services and Responsibilities

1. **Duty to Cooperate.**

1.1 Owner shall, throughout the performance of the Work, cooperate with Contractor and perform its responsibilities, obligations and services in a timely manner to facilitate Contractor’s timely and efficient performance of the Work and so as not to delay or interfere with Contractor’s performance of its obligations under the Contract Documents.

1.2 Owner shall provide timely reviews and approvals of interim design submissions and Construction Documents consistent with the turnaround times set forth in Contractor’s schedule.

1.3 Owner shall give Contractor timely notice of any Work that Owner notices to be defective or not in compliance with the Contract Documents.
2. **Furnishing of Services and Information.**

2.1 Unless expressly stated to the contrary in the Contract Documents, Owner shall provide, at its own cost and expense, for Contractor’s information and use the following, all of which Contractor is entitled to rely upon in performing the Work:

2.1.1 Surveys describing the property, boundaries, topography and reference points for use during construction, including existing service and utility lines;

2.1.2 Geotechnical studies describing subsurface conditions, and other surveys describing other latent or concealed physical conditions at the Site;

2.1.3 Temporary and permanent easements, zoning and other requirements and encumbrances affecting land use, or necessary to permit the proper design and construction of the Project and enable Contractor to perform the Work;

2.1.4 A legal description of the Site;

2.1.5 To the extent available, record drawings of any existing structures at the Site; and

2.1.6 To the extent available, environmental studies, reports and impact statements describing the environmental conditions, including Hazardous Conditions, in existence at the Site.

2.2 Owner is responsible for securing and executing all necessary agreements with adjacent land or property owners that are necessary to enable Contractor to perform the Work. Owner is further responsible for all costs, including attorneys’ fees, incurred in securing these necessary agreements.

3. **Government Approvals and Permits.**

3.1 Owner shall obtain and pay for all necessary permits, approvals, licenses, government charges and inspection fees set forth in the Owner’s Permit List attached in or as an exhibit to the Agreement.

3.2 Owner shall provide reasonable assistance to Contractor in obtaining those permits, approvals and licenses that are Contractor’s responsibility.

4. **Owner’s Separate Contractors.**

4.1 Owner is responsible for all work performed on the Project or at the Site by separate contractors under Owner’s control. Owner shall contractually require its separate contractors to cooperate with, and coordinate their activities so as not to interfere with, Contractor in order to enable Contractor to timely complete the Work consistent with the Contract Documents.
C. **Hazardous Conditions.**

1. Unless otherwise expressly provided in the Contract Documents to be part of the Work, Contractor is not responsible for any Hazardous Conditions encountered at the Site. Upon encountering any Hazardous Conditions, Contractor will stop Work immediately in the affected area and duly notify Owner and, if required by Legal Requirements, all government or quasi-government entities with jurisdiction over the Project or Site.

2. Upon receiving notice of the presence of suspected Hazardous Conditions, Owner shall take the necessary measures required to ensure that the Hazardous Conditions are remediated or rendered harmless. Such necessary measures shall include Owner retaining qualified independent experts to (i) ascertain whether Hazardous Conditions have actually been encountered, and, if they have been encountered, (ii) prescribe the remedial measures that Owner must take either to remove the Hazardous Conditions or render the Hazardous Conditions harmless.

3. Contractor shall be obligated to resume Work at the affected area of the Project only after Owner’s expert provides it with written certification that (i) the Hazardous Conditions have been removed or rendered harmless and (ii) all necessary approvals have been obtained from all government and quasi-government entities having jurisdiction over the Project or Site.

4. Contractor will be entitled, in accordance with these General Conditions of Contract, to an adjustment in its Contract Price and/or Contract Time(s) to the extent Contractor’s cost and/or time of performance have been adversely impacted by the presence of Hazardous Conditions.

5. To the fullest extent permitted by law, Owner shall indemnify, defend and hold harmless Contractor, Design Consultants, Subcontractors, anyone employed directly or indirectly by any of them, and their officers, directors, employees and agents, from and against any and all claims, losses, damages, liabilities and expenses, including attorneys’ fees and expenses, arising out of or resulting from the presence, removal or remediation of Hazardous Conditions at the Site.

6. Notwithstanding the preceding provisions of this Section, Owner is not responsible for Hazardous Conditions introduced to the Site by Contractor, Subcontractors or anyone for whose acts they may be liable. To the fullest extent permitted by law, Contractor shall indemnify, defend and hold harmless Owner and Owner’s officers, directors, employees and agents from and against all claims, losses, damages, liabilities and expenses, including attorneys’ fees and expenses, arising out of or resulting from those Hazardous Conditions introduced to the Site by Contractor, Subcontractors or anyone for whose acts they may be liable.
D. Differing Site Conditions.

1. Concealed or latent physical conditions or subsurface conditions at the Site that (i) materially differ from the conditions indicated in the Contract Documents or (ii) are of an unusual nature, differing materially from the conditions ordinarily encountered and generally recognized as inherent in the Work are collectively referred to herein as “Differing Site Conditions.” If Contractor encounters a Differing Site Condition, Contractor will be entitled to an adjustment in the Contract Price and/or Contract Time(s) to the extent Contractor’s cost and/or time of performance are adversely impacted by the Differing Site Condition.

2. Upon encountering a Differing Site Condition, Contractor shall provide prompt written notice to Owner of such condition, which notice shall not be later than fourteen (14) days after such condition has been encountered. Contractor shall, to the extent reasonably possible, provide such notice before the Differing Site Condition has been substantially disturbed or altered.
“EXHIBIT M”

[INSERT SUPPLEMENTARY CONDITIONS (IF ISSUED)]
“EXHIBIT N”

[INSERT NOTICE OF AWARD]
SECTION 9.0: EXHIBITS

Exhibit A: Proposal Submittal Checklist

Exhibit B: Price Proposal Form

Exhibit C: Non-Collusion Affidavit (See Exhibit E to Agreement at Section 8 above)

Exhibit D: Barrow County Ethics Ordinance
Exhibit A

The following submittals shall be completed and submitted with each proposal (see table below “Required Proposal Submittal Check List”). Please check to make sure that the required submittals are in the envelope before it is sealed. Failure to submit all required submittals may deem your proposal non-responsive.

<table>
<thead>
<tr>
<th>Item #</th>
<th>Required Proposal Submittal Check List</th>
<th>Check (✓)</th>
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<tbody>
<tr>
<td></td>
<td><strong>ENVELOPE 1: SOQ AND TECHNICAL PROPOSAL</strong></td>
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<tr>
<td>1</td>
<td>One (1) marked “Original” (original shall be unbound), five (5) copies plus a thumb drive with PDF copies of Documents</td>
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<td>2</td>
<td>Cover Letter</td>
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<td>3</td>
<td>Executive Summary</td>
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<td>Management Organization</td>
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<td>5</td>
<td>Relevant Project Experience</td>
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<td>6</td>
<td>Personnel Experience</td>
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<td>7</td>
<td>Licensure</td>
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<td>8</td>
<td>Bonding Requirements</td>
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<td>9</td>
<td>Technical Proposal</td>
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<td>10</td>
<td>Cover Letter</td>
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<td>11</td>
<td>Technical Executive Summary</td>
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<td>12</td>
<td>Project Delivery Approach</td>
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<td>13</td>
<td>Project Team and Past Project Collaboration</td>
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<td>14</td>
<td>Management Approach</td>
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<td>15</td>
<td>Current and Projected Workload</td>
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<td>16</td>
<td>Supplemental Services (if any)</td>
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<td>17</td>
<td>Financial Information</td>
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<tr>
<td>18</td>
<td>*Form A: Georgia Security and Immigration Contractor Affidavit(s) and Agreements (from Agreement, Exhibit G.1) Note: If prime contractor is a joint venture, partnership, LLC, each member of the entity must submit an affidavit</td>
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<tr>
<td>19</td>
<td>Licensure Forms</td>
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<td>Form C: Professional License Certifications</td>
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<td></td>
<td>Form C1: Georgia Utility License Contractor’s License</td>
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<td>Form C2: Georgia General Contractor’s License</td>
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<td>Form C3: Georgia Professional License</td>
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</table>
20  Evidence of Insurability, proposer must submit one (1) of the following:
   Letter from insurance carrier
   Certificate of Insurance
   An umbrella policy in excess of required limits for this project

21  Verify that Bidder/Proposer is registered w/Georgia Secretary of State and attach a copy of print out for each

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<thead>
<tr>
<th>Item #</th>
<th>Required Proposal Submittal</th>
<th>Check List</th>
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<td>ENVELOPE 2: COST PROPOSAL</td>
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<td>2</td>
<td>Introduction</td>
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<td>3</td>
<td>Section 8 EXECUTED Progressive Design Build Construction Agreement</td>
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<td>3</td>
<td>Section 9 Exhibit B Price Proposal Form</td>
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<tr>
<td>4</td>
<td>Section 9 Exhibit C Non-Collusion Affidavit</td>
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<tr>
<td>5</td>
<td>Hourly Billing Rates</td>
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<tr>
<td>6</td>
<td>Bid Bond</td>
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<td>7</td>
<td>Non-collusion affidavit (from Agreement, Exhibit E)</td>
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Exhibit B

Price Proposal

In compliance with the RFQP, the undersigned Design/Builder,

[legal name of Design/Builder]

[address of Design/Builder]

[telephone of Design/Builder]

[federal taxpayer identification number of Design/Builder]

having carefully examined the site(s) of the Project, the RFQP and all attachments and appendices of the RFQP, and having carefully examined the proposed Contract for Guaranteed Maximum Price or Fixed Price (Agreement) and the Owner’s standard forms and other documents included or referenced in the RFQP and any Addenda thereto, proposes and agrees, if this proposal is accepted, to enter into a contract with the Owner and to perform all of the services as set forth in the Agreement for the Design Services Price set forth below, and offers the following proposed compensation and other matters set forth below:

a. Design/Builder’s proposed Phase 1 Design Services Price, this amount being the lump sum, fixed price (including all costs, overhead and profit) amount to include in the Agreement is:

______________________________ Dollars

($______________________________); and,

b. Design/Builder’s proposed overhead, expressed as a percentage of the Cost of the Work, for all Phase 2 Services (excluding completion of the Detailed Design that is part of the Design Service Price) is

_______ percent (___%); and

c. Design/Builder’s proposed fee, expressed as a percentage of the Cost of the Work, for all Phase 2 Services (excluding completion of the Detailed Design that is part of the Phase 1 Design Service Price) is:

_______ percent (___%).
The Design/Builder understands that the Owner reserves the right to reject any or all Proposals, and to waive any technicalities or informalities.

The Design/Builder agrees that this Proposal may not be withdrawn for a period of sixty (60) calendar days after the date and time fixed for receiving said Proposals.

The undersigned Design/Builder agrees that if it is notified in writing by mail, telegraph, facsimile or hand-delivery of the acceptance of this Proposal, via Notice of Award or otherwise, within sixty (60) calendar days after the date and time fixed for receiving said Proposals, the undersigned Design/Builder will execute, within ten (10) calendar days of the date of the notice, a contract for the Phase 1 Design Services, Preliminary Consultation and Project Analysis, Preliminary Design and Detailed Design as set forth in the Agreement for the compensation amounts stated above.

The undersigned Design/Builder agrees to commence the Phase One Design Services under the Owner’s form of contract within five (5) days (or sooner if possible) after its receipt of a written Notice to Proceed from the Owner.

The undersigned Design/Builder hereby acknowledges receipt of the following Addenda:

[insert the number and date of each Addendum; if none, insert "None"]

By submission of the Proposal, Design/Builder represents and warrants that:

a. Design/Builder has read and understands the RFQP and all attachments and appendices thereto and this Proposal is made in accordance therewith;

b. Design/Builder has read and understands the Agreement including its terms and conditions for Phase 2 construction of the Project;

c. Design/Builder has visited, examined and inspected the site(s) of the Project, obtained first-hand knowledge of existing conditions; and,

d. All facts stated in the Proposal are true and correct.

By submission of this Proposal, the Design/Builder certifies that this Proposal has been derived independently, without consultation, communication or agreement as to any matter relating to this Proposal with any other design/builder or with any competitor. The Design/Builder hereby certifies that this Proposal is made without prior understanding, agreement or connection with any corporation, firm or person submitting a proposal for the same Project and is in all respects fair and without collusion or fraud. Included as part of the Proposal is the Bid Bond, Design/Builder’s Affidavit of Non-collusion and the Subcontractor’s Affidavit of Non-collusion, all in the form, manner and number required by the RFQP and applicable laws. The Design/Builder agrees to abide by all conditions of the RFQP.
Respectfully submitted,

[typed name of Design/Builder]

By: [signature of Design/Builder]

[typed name and titles of Design/Builder]

[address of Design/Builder]

(_______)
[business telephone of Design/Builder]

[date of execution by Design/Builder]
Exhibit C

NON-COLLUSION AFFIDAVIT RFQP2019-19
(This Affidavit is Part of the Proposal Documents)

See Exhibit E to form of Agreement attached above at Section 8.
BARROW COUNTY ETHICS ORDINANCE

AN ORDINANCE TO AMEND THE CODE OF ORDINANCES OF BARROW COUNTY, TO ESTABLISH THE CODE OF ETHICS FOR BARROW COUNTY; TO FURTHER AND INCORPORATE THE POLICIES AND LAWS OF THE STATE OF GEORGIA RELATING TO ETHICAL STANDARDS; TO CREATE THE BOARD OF ETHICS AND PROVIDE FOR ITS CONSTITUENT MEMBERSHIP, DUTIES, AND RESPONSIBILITIES; TO PROVIDE FOR THE INVESTIGATION OF ETHICS COMPLAINTS; TO PROVIDE FOR THE ENFORCEMENT OF ETHICAL STANDARDS; TO PROVIDE FOR SEVERABILITY; TO PROVIDE FOR AN EFFECTIVE DATE; AND FOR OTHER PURPOSES.

WHEREAS, the Constitution of the State of Georgia, approved by the voters of the State in November of 1982, and effective July 1, 1983, provides in Article IX, Section II, Paragraph I thereof, that the governing authority of the county may adopt clearly reasonable ordinances, resolutions and regulations;

WHEREAS, O.C.G.A. § 36-1-20 authorizes counties to enact ordinances for protection and preserving the public health, safety and welfare of the population of the unincorporated areas of the County;

WHEREAS, the governing authority of Barrow County, to wit, the Board of Commissioners, desires to exercise its authority in adopting this Ordinance;

WHEREAS, it is essential to the proper operation of democratic government that public officials of independent and impartial, that governmental decisions and policy be made in the proper channels of the governmental structure, that public office not be used for private gain other than the remuneration provided by law, and that there be public confidence in the integrity of government;
WHEREAS, the attainment of one or more of these ends is impaired whenever there exists a conflict between the private interests of an elected official or a governmental employee and his duties as such;

WHEREAS, the public interest, therefore, requires that the law protect against such conflicts of interest and establish appropriate ethical standards with respect to the conduct of elected officials and government employees in situations where conflicts exist;

WHEREAS, it is also essential to the proper operation of government that those best qualified be encouraged to serve the government. Accordingly, legal safeguards against conflicts of interest must be so designed as not unnecessarily or unreasonably to impede the recruitment and retention by the government of those men and women who are best qualified to serve it;

WHEREAS, an essential principle underlying the staffing of our government structure is that its elected officials and employees should not be denied the opportunity, available to all other citizens, to acquire and retain private economic and other interests, except where conflicts with the responsibility of such elected officials and employees to the public cannot be avoided;

WHEREAS, in recognition of these goals and principles, it is the policy of the Board of Commissioners to institute, establish, promote and enforce standards of ethical conduct for all of Barrow County’s officers and employees; and

WHEREAS, it is a further policy of the Board of Commissioners that the proper administration of Barrow County’s government and the promotion and enforcement of standards of ethical conduct for Barrow County’s officers and employees would be best served by the creation of a Barrow County Board of Ethics for the investigation of complaints related to ethical standards;
NOW, THEREFORE, BE IT ORDAINED AND RESOLVED BY THE BOARD OF

COMMISSIONERS OF BARROW COUNTY, GEORGIA AS FOLLOWS:

ARTICLE ONE: GENERAL PROVISIONS

Section One. Short Title.

This Ordinance shall be known as "The Barrow County Ethics Ordinance," and may be
Cited and referred to as such.

Section Two. Definitions.

For the purposes of this Ordinance, the following terms, phrases, words and their
derivations shall have the meaning provided herein. When no inconsistent with the context,
words used in the present tense include the future, words in the plural number included the
singular number and words in the singular number include the plural number.

(A) "Board" means the Barrow County Board of Commissioners.

(B) "Board of Ethics" means the Barrow County Board of Ethics as formed and
described herein.

(C) "Business Entity" means any business of whatever nature regardless of how
designated or formed, whether a sole proprietorship, partnership, joint venture,
association, trust, corporation, limited liability company, or any other ty0pe of
business enterprise and whether a person acting on behalf of, or as a
representative or agent of, the business entity.

(D) "Confidential Information" means any information that, by law or practice, is not
reasonably available to the public.

(E) "County Official" means the Barrow County Board of Commissioners, any
member

of a board, commission or authority appointed by the Board, the Chief of
Operations or his/her equivalent and any other elected or appointed officer or employee of Barrow County, including those employees who are exempt from the Barrow County Civil Service System, except to the extent prohibited by law.

(F) "Employee" means all those persons employed on a regular or part-time basis by The County, as well as those persons whose services are retained under the terms of a contract with the County, including those employees who are exempt from the Barrow County Civil Service System, except to the extent prohibited by law.

(G) "Family" means the spouse, parents, children, brothers and sisters, related by blood or marriage of a county official or employee.

(H) "Interest" means direct or indirect pecuniary or material benefit accruing to a County Official or Employee as a result of a contract or transaction which is or may be the subject of an official act or action by or with the County, except for such contracts or transactions which, by their terms and by the substance of their provisions, confer the opportunity and right to realize the accrual of similar benefits to all other persons and/or property similarly situated. The term "interest" shall not include any remote interest. For purposes of this Ordinance, a County Official or Employee shall be deemed to have an interest in the affairs of:

(1) His or her family;

(2) Any business entity in which the county official or employee is a member, officer, director, employee or prospective employee;

(3) Any business entity as to which the stock, legal ownership, or beneficial ownership of a county official or employee is in excess of five percent (5%) of the total stock or total legal and beneficial ownership, or which is
controlled or owned directly or indirectly by the county official or employee.

(l) "Official Act" or "Official Duties" means any legislative, administrative, appointive or discretionary act of any County Official or Employee of the County or any agency, board, authority or commission thereof.

ARTICLE TWO: CODE OF ETHICS FOR COUNTY SERVICE GENERALLY AND FOR EMPLOYEES

This Article Two is intended to adopt and incorporate herein for local enforcement the ethical standards of O.C.G.A. § 45-10-1, as it may be amended from time to time.

Any person in County service shall;

Section One.

Put loyalty to the highest moral principles and to country above loyalty to person, party, or government department.

Section Two.

Uphold the Constitution, laws and legal regulations of the United States and the State of Georgia and of all governments therein and never be a party to their evasion.

Section Three.

Give a full day's labor for a full day's pay and give to the performance of his duties his earnest effort and best thought.

Section Four.

Seek to find and employ more efficient and economical ways of getting tasks accomplished.
Section Five

Never discriminate unfairly by the dispensing of special favors or privileges to anyone, whether for remuneration or not, and never accept, for himself or his family, favors or benefits under circumstances which might be construed by reasonable persons as influencing the performance of his governmental duties.

Section Six

Make no private promises of any kind binding upon the duties of office, since a government employee has no private word that can be binding on public duty.

Section Seven

Engage in no business with the government, either directly or indirectly, which is inconsistent with the conscientious performance of his governmental duties.

Section Eight

Never use any information coming to him confidentially in the performance of governmental duties as a means for making private profit.

Section Nine

Expose corruption wherever discovered.

Section Ten

Uphold these principles, ever conscious that public office is a public trust.

ARTICLE THREE: CODE OF ETHICS FOR COUNTY OFFICIALS AND DEPARTMENT DIRECTORS

This Article Three is intended to adopt and incorporate herein for local enforcement the ethical standards of O.C.G.A.§ 45-10-3, as it may be amended from time to time.

All County Officials and Department Directors shall:
Section One.

Uphold the Constitution, laws and regulations of the United States, the State of Georgia, the County of Barrow and all governments therein and never be a party to their evasion.

Section Two.

Never discriminate by the dispensing of special favors or privileges to anyone, whether or not for remuneration.

Section Three.

Not engage in any business with the government, either directly or indirectly, which is inconsistent with the conscientious performance of his governmental duties.

Section Four.

Never use any information coming to him confidentially in the performance of governmental duties as a means for making private profit.

Section Five.

Expose corruption wherever discovered.

Section Six.

Never solicit, accept, or agree to accept gifts, loans, gratuities, discounts, favors, hospitality or services from any person, association or corporation under circumstances from which it could reasonably be inferred that a major purpose of the donor is to influence the performance of the member's official duties.

Section Seven.

Never accept any economic opportunity under circumstances where he knows or should know that there is a substantial possibility that the opportunity is being afforded him with intent to influence his conduct in the performance of his official duties.
Section Eight.

Never engage in other conduct which is unbecoming to a member or which constitutes a breach of public trust.

Section Nine.

Never take any official action with regard to any matter under circumstances in which he knows or should know that he has a direct or indirect monetary interest in the subject matter of such matter or in the outcome of such official action.

ARTICLE FOUR: SPECIFIC PROVISIONS RELATED TO CONFLICT OF INTEREST TRANSACTIONS AND DISCLOSURES

The following provisions related to conflict of interest transactions and disclosures are intended to supplement and elaborate upon the Code of Ethics set forth in Articles Two and Three above and all such provisions shall be read and interpreted in accordance therewith.

Section One. Compliance with Applicable Law.

No County Official or Employee shall engage in any activity or transaction that is prohibited by law, now existing or hereafter enacted, which is applicable to him or her by virtue of his or her office or employment. Other provisions of law or regulations shall apply when any provisions of this Ordinance shall conflict with the laws of the State of Georgia or the United States, except to the extent that this Ordinance permissibly sets forth a more stringent standard of conduct. The laws of the State of Georgia or the United States shall apply when this Ordinance is silent.

Section Two. Conflict of Interest Transactions.

(A) No County Official or Employee shall acquire or maintain an interest in any contract or transaction if a reasonable basis exists that such an interest will be affected directly by his or her official act or action or by official acts or actions of
the County, which the County Official or Employee has a reasonable opportunity to influence, except consistent with the disclosure and abstention provisions set forth herein.

(B) Barrow County shall not enter into any contract involving services or property with a County Official or Employee or with a business entity in which the County Official or an Employee has an interest. Provided that the disclosure and abstention provisions set forth herein are followed, this paragraph shall not apply to the following:

(1) The designation of a bank or trust company as a depository for county funds;

(2) The borrowing of funds from any bank or lending institution which offers competitive rates for such loans;

(3) Contracts entered into with a business which employs a consultant, provided that the consultant's employment with the business is not incompatible with this Ordinance;

(4) Contracts for services entered into with a business which is the only available source for such goods or services; and

(5) Contracts entered into under circumstances that constitute an emergency situation, provided that a record explaining the emergency is prepared by the Board and submitted to the Chief of Operations (or his/her equivalent) to be kept on file.
Section Three.  Financial Disclosures.

Financial disclosures shall be governed by federal and state law as it may be amended from time to time and this Ordinance shall not require any additional financial disclosure reports to be filed other than those required by federal and state law.

Section Four.  Zoning Application Disclosures.

All disclosures with regard to zoning applications shall be governed in their entirety by the Conflict of Interest in Zoning Actions provisions contained in O.C.G.A.§ 36-67A-1, et seq., as it may be amended from time to time.

Section Five.  Disclosures Related to Submission of Bids or Proposals for County Work or Contract.

Persons submitting bids or proposals for county work who have contributed $250.00 or more to a County Official must disclose on their bid or proposal the name of the County Official(s) to whom the contribution was made and the amount contributed. Such a disclosure must also be made prior to a request for any change order or extension of any contract awarded to the person who submitted the successful bid or proposal.

Section Six.  Withholding of Information.

No County Official or Employee shall knowingly withhold any information that would impair the proper decision making of the Board or any of the County's boards, agencies, authorities or departments.

Section Seven.  Incompatible Service.

No County Official or Employee shall engage in or accept private or public employment or render service for any private or public entity, when such employment or service is incompatible with the proper discharge of his or her official duties or would tend to impair his or her independence of judgment or action in the performance of his or her official duties, unless
otherwise permitted by law and unless public disclosure is made.

**Section Eight. Unauthorized Use of Public Property.**

No County Official or Employee shall request or permit the unauthorized use of county-owned vehicles and equipment, including but not limited to computers, pagers and cellular telephones, materials or property for personal convenience or profit.

**Section Nine. Political Recrimination and Activity.**

(A) No County Official or Employee, whether elected or appointed, shall either cause the dismissal or threaten the dismissal from any county position as a reward or punishment for any political activity. No County Official or Employee shall direct any person employed by the County to undertake political activity on behalf of such County Official or Employee, any other County Official or Employee, or any other individual, political party, group or business organization, during such time that the Employee is required to conduct county business. This section does not prohibit incidental telephone calls made for the purpose of scheduling a County Official’s daily county business.

(B) Employees of the county are encouraged to exercise their right to vote, but no employee shall make use of government time or equipment to aid a political candidate, party or cause; or use a government position to influence, coerce, or intimidate any person in the interest of a political candidate, party or cause. No employee shall be hired, promoted, favored or discriminated against with respect to employments because of his or her political opinions or affiliations.

(1) **Seeking elective office.** A government employee seeking elective office within the county may, upon declaring candidacy, either resign or submit a
request in writing to the Chief of Operations (or his/her equivalent) for a leave of absence without pay from the date of his or her announcement through the duration of the campaign or announcement of the election results. In the alternative, the government employee seeking elective office within the County may continue to work for the County, provided, however, that the employee shall not engage in election activities during his or her County working hours or with use of County equipment. If elected to office, the employee shall immediately, upon the date of election, be separated from employment with the county upon written request and approval of the Chief of Operations (or his/her equivalent).

(2) **Political campaign involvement.** A government employee may not be involved in any political activity which would constitute a conflict of interest; including participation in any aspect of any political campaign for any office in Barrow County Government.

(3) **Solicitation of contributions.** A government employee may not knowingly solicit, accept or receive political contributions from any person, to be used in support of or opposition to any candidate for office in the county.

**Section Ten. Appearance Before County Entities.**

No County Official or Employee shall appear on behalf of any private person other than himself or herself, his or her spouse, or his or her minor children, before any county agency, authority or board. However, a member of the Board of Commissioners may appear before such groups on behalf of his constituents in the course of his duties as a representative of the electorate or in the performance of public or civic obligations.
Section Eleven. Timely Payment of Debts to the County and Fiscal Responsibility.

All County Officials and Employees shall pay and settle, in a timely and prompt fashion, all accounts between them and Barrow County, including the prompt payment of all taxes and shall otherwise demonstrate personal fiscal responsibility.

Section Twelve. Solicitation or Acceptance of Gifts.

(A) County Officials and employees shall not accept gifts, gratuities or loans from organizations, business concerns, or individuals with whom he or she has official relationships on business of the county government. These limitations are not intended to prohibit the acceptance of articles of negligible value which are distributed generally, nor to prohibit employees from accepting social courtesies which promote good public relations, or to prohibit employees from obtaining loans from regular lending institutions. It is particularly important that inspectors, contracting officers and enforcement officers guard against relationships which might be construed as evidence of favoritism, coercion, unfair advantage or collusion.

(B) Consistent with the provisions set forth in Articles Two and Three and Section 12(A) above, there shall be no violation of this Ordinance in the following circumstances:

(1) Meals and beverages given in the usual course of entertaining associated with normal and customary business or social functions.

(2) An occasional gift from a single source of $101.00 or less in any calendar year.

(3) Ceremonial gifts or awards.
(4) Gifts of advertising value only or promotional items generally distributed

To public officials.

(5) Awards presented in recognition of public service.

(6) Reasonable expenses of food, travel, lodging and scheduled entertainment

for a meeting that is given in return for participation in a panel or speaking
engagement at the meeting.

(7) Courtesy tickets or free admission extended for an event as a courtesy or

for ceremonial purposes, given on an occasional basis and not to include
season tickets of any nature.

(8) Gifts from relatives or members of the County Official or Employee’s

household.

(9) Honorariums or awards for professional achievement.

(10) Courtesy tickets or free admission to educational seminars, educational or

information conventions or other similar events.

Section Thirteen. Disclosure of Interest.

Any member of the Board who has a financial or personal interest in any proposed
legislation or action before the Board shall immediately disclose publicly the nature and extent
of such interest.

Any other County Official or Employee who has a financial or personal interest in any
proposed legislation or action before the Board and who participates in discussion with or
gives an official opinion or recommendation to the Board in connection with such proposed
legislation or action shall disclose publicly the nature and extent of such interest.
Section Fourteen. Abstention to Avoid Conflicts of Interest.

(A) Except as otherwise provided by law, no County Official or Employee shall participate in the discussion, debate, deliberation, vote or otherwise take part in the decision-making process on any item before him in which the County Official or Employee has a conflict of interest as set forth above.

(B) To avoid the appearance of impropriety, if any County Official or Employee has a conflict of interest or has an interest that he or she has reason to believe either violates this Ordinance or may affect his or her official acts or actions in any matter, the County Official or Employee shall immediately leave the meeting room, except that if the matter is being considered at a public meeting, the County Official or Employee may remain in the meeting room.

(C) In the event of a conflict of interest, the County Official or Employee shall announce his or her intent to abstain prior to the beginning of the discussion, debate, deliberation or vote on the item, shall not participate in any way, and shall abstain from casting a vote.

ARTICLE FIVE: THE BOARD OF ETHICS

Section One. Creation and Composition of Board of Ethics.

There is hereby created a five-member Barrow County Board of Ethics, which shall consist of the following members:

(A) One appointee by the Board of Directors of the Barrow County Chamber of Commerce.

(B) One appointee selected by a majority of the voting County elected officials (not including the members of the Board of Commissioners) who shall each have one vote for such appointee:
(C) One appointee selected by a majority of the voting employees of Barrow County (not including the County elected officials or the members of the Board of Commissioners) who are in the employ of Barrow County on a full-time basis on the effective date of the vote, which vote shall be conducted by the Director of Human Resources or his/her designee;

(D) One appointee of the Barrow County Personnel Review Board; and

(E) One appointee of the Barrow County Board of Commissioners, which appointee shall be selected by a majority vote of the Board of Commissioners.

Section Two. Appointment Procedures.

The initial appointments of the members of the Board of Ethics shall be accomplished as follows: Within five (5) business days of the effective date of this Ordinance, the Barrow County Chief of Operations (or his/her equivalent) or his/her designee shall notify the respective appointing body or individuals of the duty to appoint or vote upon a member for placement on the Board of Ethics. The body or individuals so notified shall have thirty (30) days in which to conduct their appointment process and provide the Chief of Operations (or his/her equivalent) with the name of the appointment, or the name of the individual for whom he or she is voting as the appointee in the case of the elected officials. Within five (5) business days of receipt of the appointment information or calculation of the votes as the case may be, the Chief of Operations (or his/her equivalent) shall thereafter provide the names of the appointees to the Board of Commissioners. The Board of Commissioners shall appoint the five persons so identified at the next regular meeting of the Board of Commissioners following receipt of the names of the appointees from the Chief of Operations (or his/her equivalent).

All appointments following the expiration of the initial terms and all appointments made
In the cases of vacancies created during a particular term shall be made by the applicable body or individuals as indicated in Section One of this Article. The Chief of Operations (or his/her equivalent) or his/her designee shall notify the applicable body or individuals responsible for making an appointment at least forty-five (45) days prior to the expiration of the respective term or immediately upon knowledge of a vacancy created during a term. Upon such notification, the appointment process shall proceed as set forth above in this Section.

Section Three. Qualifications of Members of Board of Ethics.

A person is eligible to be appointed as a member of the Board of Ethics if the person, while serving:

(A) Resides in the County and is a registered voter;
(B) Is not an Employee or County Official and has not been an Employee or County Official during the three (3) months immediately preceding his or her appointment or be the spouse, parent, child or sibling of an Employee or County Official;
(C) Is not an officer or employee of any political party;
(D) Does not hold any elected or appointed office and is not a candidate for office of the United States, this State or the County and has not held any elected or appointed office during the three (3) months immediately preceding his or her appointment.

Section Four. Terms; Vacancies.

Members of the Board of Ethics shall each serve a two (2) year term without compensation, and shall continue to serve until their successors are appointed and qualified. The Board positions appointed pursuant to sub-sections (A), (B), and (C) of Section One of this
Article shall serve an initial full two-year term and shall thereafter serve two-year terms upon appointment. The Board positions appointed pursuant to sub-sections (D) and (E) of Section One of this Article shall serve an initial one-year term and shall thereafter serve two-year terms upon appointment. If any vacancy occurs during a term, the remaining members shall at that time choose an alternate member mutually agreed upon to temporarily serve until the position is filled by appointment as provided in Section One and Section Two to fulfill the remainder of the then existing term.

**Section Five.**  
**Removal of Member.**

The Board of Commissioners may remove a member of the Board of Ethics on the grounds of neglect of duty, misconduct in office or engagement in political activity in violation of this Ordinance. Before initiating the removal of a member from the Board of Ethics, the Board of Commissioners shall give the member written notice of the reason for the intended action and the member shall have the opportunity to reply. Thereafter, the Board of Commissioners shall afford such member an opportunity for a hearing before the Board of Commissioners.

**Section Six.** **Organization and Internal Operating Regulations.**

(A) Members of the Board of Ethics shall not be compensated.

(B) The Board of Ethics shall elect one of its members to act as Chairperson for a term of one year or until a successor is duly elected. The Board of Ethics shall also elect one of its members to act as Vice-Chairperson for the same term and to act for the Chairperson in his or her absence, because of disqualification or vacancy.

(C) There shall be no regularly scheduled monthly or bimonthly meetings of the
Board of Ethics, however, the Board of Ethics shall meet at least once annually in January of each year for purposes of election of officers and such other business as the Board of Ethics deems proper and in accordance with this Ordinance. Meetings shall be called by majority vote or by call of the chairperson. Meetings of the Board of Ethics shall be conducted in the public hearing room utilized by the Board of Commissioners, shall be duly publicized, and shall be otherwise conducted in accordance with the open meetings requirements under state law.

(D) Three members of the Board of Ethics shall constitute a quorum for the transaction of business. The Chairperson shall be entitled to the same voting rights as the other members of the Board of Ethics.

(E) No official action concerning complaints shall be taken by the Board of Ethics, except by the affirmative vote of at least four (4) members of the Board of Ethics.

Section Seven. Duties and Powers.

The Board of Ethics shall have the following duties and powers:

(A) To establish any procedures, rules and regulations governing its internal organization and conduct of its affairs, provided that such procedures, rules and regulations do not conflict with any provision contained herein.

(B) To receive and hear complaints of violations of standards required by this Ordinance.

(C) To make investigations as it deems necessary to determine whether any person has violated this Ordinance, but only after a least four (4) members of the Board of Ethics have voted affirmatively to conduct the investigation.

(D) To take such action as provided in this Ordinance as deemed appropriate because of any violation of this Ordinance.
(E) To perform any other function authorized by this Ordinance.

(F) To issue advisory opinions as provided in this Ordinance.

Section Eight. Staffing and Expenses.

The Board of Ethics shall be provided sufficient meeting space and other reasonable supportive services to carry out its duties required under this Ordinance. The Chief of Operations (or his/her equivalent) shall designate an administration employee who shall serve as the filing clerk for the Board of Ethics and who shall be authorized to receive all filings before the Board of Ethics to publish notices of all meetings upon request of the Board of Ethics' Chairperson and to serve as the recording clerk for the Board of Ethics.

Section Nine. Counsel.

The Board of Ethics may petition the Barrow County Board of Commissioners for appointment of counsel on a case-by-case basis to assist it in carrying out its responsibilities or to act as a hearing officer. Any such appointed counsel shall be approved by the Board of Commissioners, shall perform services at an approved hourly rate, and shall serve at the joint pleasure of the Board of Ethics and the Board of Commissioners.

Section Ten. Adherence to the Ethics Ordinance.

The Board of Ethics shall be governed by and subject to this Ordinance, except as to any requirements related to financial disclosures. If a member of the Board of Ethics has a conflict of interest or must disqualify himself under this Ethics Code or by law, the remaining members shall at that time choose an alternate person mutually agreed upon to hear that matter.
Section Eleven. Prohibition Against Certain Conflicting Political Activity.

(A) Definitions. The following words, terms and phrases, when used in this section, shall have the meanings ascribed to them, except where the context clearly indicates a different meaning:

(1) "Member of the Board of Ethics" means an individual who occupies the position of a member of the Board of Ethics or a prospective member of the Board of Ethics.

(2) "Political Party" means a national political party, a state political party, a political action committee, and/or any affiliated organization.

(3) "Election" includes a primary, special and general election.

(4) "Nonpartisan Election" means:

   (a) An election at which none of the candidates is to be nominated or elected as representing a political party, any of whose candidates for presidential elector received votes in the last preceding election at which presidential electors were selected; and

   (b) An election involving a question or issue which is not specifically identified with a political party, such as a constitutional amendment, referendum, approval of a governmental ordinance, or any question or issue of similar character.

(5) "Partisan" when used as an adjective, refers to a political party.

(6) "Political Fund" means any fund, organization, political action committee or other entity that, for purposes of influencing in any way the outcome of any partisan election, receives or expends money or
anything of value or transfers money or anything of value to any other
fund, political party, candidate, organization, political action committee
or other entity.

(7) **Contribution** means any gift, subscription, loan, advance, deposit of
money, allotment of money, or anything of value given or transferred by
one person to another, including in cash, by check, by draft, through a
payroll deduction or allotment plan, by pledge or promise, whether or
not enforceable, or otherwise.

(B) **Permissible Activities.** All members of the Board of Ethics are free to engage in
political activity to the widest extent consistent with the restrictions imposed in
this Section, which restrictions are imposed for the sole purpose of ensuring
neutrality and the appearance of neutrality of the Board of Ethics. Each member
of the Board of Ethics retains the right to:

(1) Register and vote in any election;
(2) Participate in the nonpartisan activities of a civic, community, social,
labor, or professional organization or of a similar organization;
(3) Be a member of a political party or other political organization and
participate in its activities to the extent consistent with law;
(4) Attend a political convention, rally, fundraising function, or other
political gathering;
(5) Sign a political petition as an individual;
(6) Make a financial contribution to a political party or organization;
(7) Take an active part, as a candidate or in support of a candidate, in a
nonpartisan election;

(8) Be politically active in connection with a question which is not specifically identified with a political party, such as a constitutional amendment, referendum, approval of a governmental ordinance or any other question or issue of a similar character;

(9) Serve as an election judge or clerk or in a similar position to perform nonpartisan duties as prescribed by state or local law; and

(10) Otherwise participate fully in public affairs in a manner which does not materially compromise his or her efficiency or integrity as a member of the Board of Ethics or the neutrality, efficiency or integrity of the Board of Ethics.

(C) Prohibited Activities.

(1) A member of the Board of Ethics may not take an active part in political management or in a political campaign, except as permitted by subsection of this section.

(2) A member of the Board of Ethics shall not take part in or be permitted to do any of the following activities:

(a) Serve as an officer of a political party, a member of a national, state or local committee of a political party, an officer or member of a committee of a partisan political club, or be a candidate for any of these positions;

(b) Organize or reorganize a political party organization or political club;

(c) Directly or indirectly solicit, receive, collect, handle, disburse, or
account for assessments, contributions or other funds for a partisan political purpose;

(d) Organize, sell tickets to, promote or actively participate in a fundraising activity of a candidate in a partisan election or of a political party or political club;

(e) Take an active part in managing the political campaign of a Candidate for public office in a partisan election or a candidate for political party office;

(f) Become a candidate for, or campaign for, an elective public office in a partisan election;

(g) Solicit votes in support of or in opposition to a candidate for Public office in a partisan election;

(h) Act as recorder, watcher, challenger or similar officer at the polls on behalf of a political party or a candidate in a partisan election;

(i) Drive voters to the polls on behalf of a political party or a candidate in a partisan election;

(j) Endorse or oppose a candidate for public office in a partisan election or a candidate for political party office in a political advertisement, broadcast, campaign literature, or similar material;

(k) Serve as a delegate, alternate or proxy to a political party convention;

(l) Address a convention, caucus, rally or similar gathering of a political party in support of or in opposition to a partisan
candidate for public office or political party office;

(m) Initiate or circulate a partisan nominating position.

(3) Nothing contained in this section shall prohibit activity in political management or in a political campaign by any member of the Board of ethics connected with a nonpartisan election or a nonpartisan issue of any type.

Section Twelve. Limitation of Liability.

No member of the Board of Ethics, or any person acting on behalf of the Board of Ethics, shall be liable to any person for any damages arising out of the enforcement or operation of this Ethics Ordinance, except in the case of willful or wanton conduct. This limitation of liability shall apply to the County, the members of the Board of Ethics, the employees of the Board of Ethics and any person acting under the direction of the Board of Ethics.

Section Thirteen. Advisory Opinion.

The Board of Ethics shall render an advisory opinion based on a real or hypothetical set of circumstances when requested to do so in writing by a County Official or Employee related to that County Official's or Employee’s conduct or transaction of business. Such advisory opinions shall be rendered pursuant only to a written request, fully setting forth the circumstances to be reviewed by the Ethics Board. The proceedings of the Ethics Board pursuant to this section shall be held in public to the extent consistent with state law and the opinions of the Ethics Board shall be made available to the public.

Section Fourteen. Complaints.

The Board of Ethics shall be responsible for hearing and deciding any complaints filed regarding alleged violations of this Ordinance by any person. The following procedures shall be followed when filing a complaint:
Any person may file a complaint alleging a violation of any of the provisions of This Ordinance by submitting it to the Chief of Operations (or his/her equivalent), who shall immediately deliver such complaint to the Chairman of the Board of Ethics or his or her designee. A copy of such complaint shall immediately be forwarded by registered mail to the County Official or Employee against whom the complaint was filed. The complaint must be supported by affidavits based on personal knowledge, shall set forth such facts as would be admissible in evidence, and shall show affirmatively that the affiant is competent to testify to the matters stated therein. All documents referred to in an affidavit(s) should be attached to the affidavit(s). The person filing the complaint shall verify the complaint by his or her signature thereon. A complaint must be filed within six (6) months of the date the alleged violation is said to have occurred, or in case of concealment or nondisclosure within six (6) months of the date the alleged violation should have been discovered after due diligence. In the event the Board of Ethics makes an initial determination that a complaint is technically deficient, the Board of Ethics shall submit a list of deficiencies to the complainant and offer the complainant the opportunity to correct the deficiencies within seven (7) days prior to the complaint being dismissed for technical deficiencies.

Upon receipt of a complaint alleging misconduct, the County Official or Employee against whom the complaint was filed may reply to the complaint within thirty (30) days, unless such time for reply is extended by the Board of Ethics upon good cause shown. The response of the County Official or Employee must be supported by affidavits based on personal knowledge, must set forth such facts as would be admissible in evidence and must show
affirmatively that the affiant is competent to testify to the matters stated therein.

All documents referred to in an affidavit(s) should be attached to the affidavit(s).

(C) Within sixty (60) days of receipt of a complaint, the Board of Ethics shall conduct an investigatory review to determine whether specific substantiated evidence from a credible source(s) exists to support a reasonable belief that there has been a violation of this Ordinance. If after reviewing the complaint the Board of Ethics by vote determines that no specific, substantiated evidence from a credible source(s) exists to support a reasonable belief that there has been a violation of this Ordinance or determines that no violation occurred, it may dismiss the complaint without further proceedings. In the event a complaint is dismissed based upon the merits of the complaint, the complaint may not be re-filed.

(D) If the Board of Ethics determines that specific, substantiated evidence from a credible sources(s) exists to support a reasonable belief that there has been a violation of this Ordinance, certified written notice of a hearing, containing the time, date and place of such hearing, shall be given to each party by the Board of Ethics and a formal public hearing shall be conducted and both parties afforded an opportunity to be heard. Any formal public hearing shall be conducted in accordance with the requirements of due process. The Board of Ethics is authorized to swear witnesses.

(E) Any final determination resulting from the hearing shall include written findings of fact and conclusions of law. The Board of Ethics shall determine if clear and convincing evidence shows any violation of this Ordinance.

(F) Nothing in this section shall be considered to limit or encumber the right of the Board of Ethics to initiate an investigation on its own cognizance as it deems
Necessary to fulfill its obligations under this Ordinance.

Section Fifteen. Disciplinary Action.

(A) Upon a determination that an employee has violated this Ordinance, the Board of Ethics may recommend the following penalties and actions:

(1) Written warning or reprimand;
(2) Suspension without pay;
(3) Termination of employment; and
(4) Repayment to the County of any unjust enrichment.

(B) Upon a determination that a County Official has violated this Ordinance, the Board of Ethics may recommend the following penalties and actions:

(1) Written warning, censure or reprimand;
(2) Removal from office to the extent provided by Georgia law; and
(3) Repayment to the County of any unjust enrichment.

(C) Upon direction of the Board of Ethics, a petition may be filed for injunctive relief, or any other appropriate relief, in the county superior court or in any other court having proper venue and jurisdiction, for the purpose of requiring compliance with the provisions of this Ordinance. In addition, the court may issue an order to cease and desist from the violation of the Ordinance. The court also may void an official action that is the subject of the violation, provided that the legal action to void the matter was brought with ninety (90) days of the occurrence of the official action, if the court deems voiding the action to be in the best interest of the public. The Court, after hearing and considering all the circumstances in the case, may grant all or part of the relief sought. However, the court may not void any official action appropriating public funds, levying taxes or providing for the
issuance of bonds, notes or other evidence of public obligation under this Ordinance.

(D) In addition to any other remedy provided herein, upon determination of a Violation of this Ordinance, the Board of Ethics may recommend to the Board of Commissioners in writing that any contract, bid or change order that was the Subject of the violation should be cancelled or rescinded. The Board of Commissioners, however, shall retain the discretion to determine whether such a Cancellation or rescission would be in the best interest of the County and shall not be bound in any way by a recommendation of the Board of Ethics.

(E) The Ethics Board may also forward its findings of fact and conclusions of law to the Barrow County District Attorney's Office and/or the Office of the Governor for appropriate action.

Section Sixteen. Judicial review.

(A) Any party against whom a decision of the Board of Ethics is rendered may obtain judicial review of the decision by writ of certiorari to the superior court of the County. The application for the writ must be filed within thirty (30) days from the date of the written decision. Judicial review shall be based upon the record. No party shall be entitled to a de novo appeal.

(B) Upon failure to timely request judicial review of the decision by writ of certiorari as provided in this section, the decision shall be binding and final upon all parties.

(C) The appellate rights afforded hereunder shall be in lieu of any right to appeal an adverse employment action under the Barrow County Civil Service
System, to the extent the County Official or employee may be subject to the
Civil Service System.

ARTICLE SIX: MISCELLANEOUS

Section One. Severability.

If any provision of this Ordinance is found by a court of competent jurisdiction to be
invalid or unconstitutional, or if the application of this Ordinance to any person or
circumstances is found to be invalid or unconstitutional, such invalidity or unconstitutionality
shall not affect other provisions or applications of this Ordinance which can be given effect
without the invalid or unconstitutional provision or application.

Section Two. Repealer

All laws, resolution, or ordinances or parts thereof that conflict with the provisions of this
Ordinance are repealed.

Section Three. Effective Date.

The effective date of this Ordinance shall be July 1, 2004.

AMENDED:

Article Five, Section 1, Subparagraph (A) January 25, 2005
Article Five, Section 6, Subparagraph (C) January 8, 2008
APPENDIX 1: PROCESS DESIGN AND PERFORMANCE CRITERIA

1.1 GENERAL

The PDB Company shall design and construct, for the County’s acceptance, the Project that meets any and all RFQP, Local, State, and Federal permit requirements, regulatory requirements, applicable law relating to effluent quality, noise, and odor, and provides the most advantageous benefits to Barrow County. The most stringent requirement shall govern. See Appendix 11 for details of the County’s required guarantees for performance in the areas of effluent quality, odor control, noise control, and operational cost. These Appendices present the requirements for redundancy, reliability, emergency power, effluent quality, odor, and noise; however, it is not the desire of the County to limit innovation by the PDB Company in meeting these requirements.

1.2 PROCESS DESIGN AND PERFORMANCE GUARANTEE

1.2.1 Influent Design Basis

Flows and loadings for the plant design are included in the DDR in Attachment 4. Historical data for the plant is provided with the DDR, which include, among others, Discharge Monitoring Reports, the most recent NPDES permit application, and other applicable information related to the collection system. It is anticipated that the PDB Company may need to perform additional sampling, analysis and evaluations.

1.2.2 Reliability and Standby Power Requirements

As a minimum, the Plant shall be designed for EPA Class I Reliability, as defined in Design Criteria for Mechanical, Electrical, and Fluid System and Component Reliability, USEPA Technical Bulletin, EPA-430-99-74-001, latest revision. Barrow County requires the facility be provided with an onsite emergency power system. An emergency power generation system is required that will provide standby power generation for all plant loads. The emergency power generation system should include all control systems, fuel systems and automatic start and power switching system necessary for its function. Barrow County requires that the PDB Company provide coordination between the local power source and the emergency power system. The PDB Company will provide the design, construction, and start-up of the emergency power generation system. The PDB Company shall take incorporate in their design, the mitigation of noise due to the operation of backup power generators.

Treatment processes shall be designed to be operational in any historically known flood levels, but no less than at the 100-year flood elevation.

1.2.3 Effluent Quality Performance Guarantee

Proposed plant maximum effluent limits are specified in the Wasteload Allocation (WLA) letter issued by Georgia Environmental Protection Division (GA EPD) and provided in Section 10.
1.2.4 Process Design Requirements

The County will evaluate processes based upon the information provided only for full analysis of the conditions of service and plant process requirement to ensure the functions are performed. The PDB Company & County will collaborate with each other to review PDB’s information & the County will provide input in the plant process requirements.

1.2.5 Treatment Testing Criteria

Process level treatment, which may include but not limited to

A. Screenings capture efficiency
B. Grit removal efficiency
C. Dewatering performance
D. Aeration efficiency as power used to complete nitrification
E. Chemical use
F. Aeration efficiency as Power use measured as kWhr/pound of TKN/NH3-N nitrified
G. Etc.
APPENDIX 2: BUILDING PROGRAM GUIDELINES

Building shall be arranged to optimize operational efficiency. Spaces shall be located to allow easy access to required equipment.

2.1 CODE DATA

The PDB Company shall conduct a code review for all buildings to be constructed for this project and the code data shall be provided on the construction drawings. The data shall be located on the drawing with the first floor plan of each structure, as applicable. The code data shall be as follows:

- Occupancy Group Classification (list by area if appropriate);
- Type of Construction;
- Building Height;
- Height Limitation;
- Total Floor Area (list floor area for each identified occupancy);
- Largest Floor Area;
- Area Limitation;
- Occupancy Load (list total calculated and actual); and
- Numbers of Means of Egress.

2.2 INTERIOR FINISHES

- The following is a guide to the selection of interior finishes.
- Interior finishes shall be selected based on the environment of the specific room - corrosive, wet, etc.
- All interior surfaces shall be finished according to their use.
- Finishes shall be light in color to enhance natural lighting.
- Submit finishes for all facilities to Barrow County for approval.

2.3 BARRIER-FREE DESIGN

The PDB Company shall design all buildings to comply with accessibility codes and laws.

2.4 NOISE CONTROL

The PDB Company shall determine the levels and sources of noise emanating from facilities and limit, by appropriate means, the decibel levels, inside and outside the facilities, to comply with applicable laws and regulations. Various means can be used to absorb and limit sound transmission: materials, placement of openings, wall construction, etc.

2.5 HEALTH AND SAFETY

The PDB Company shall design all facilities to meet all applicable codes and laws concerning safety. It is the intent of the County to provide a safe working environment.
2.6 BUILDING SYSTEMS

1. HVAC System
   The HVAC systems and components shall meet local, state and federal codes, including ASHRAE and NFPA.

   The PDB COMPANY Work in process areas shall be ventilated in accordance with NFPA’s Standard 820, Fire Protection in Wastewater Treatment and Collection Facilities. The intended ventilation rates shall be coordinated with National Electric Code (NEC) requirements and electrical equipment construction. Adequacy of these ventilation rates shall be verified against motor and electrical equipment heat gain calculations to ensure acceptable indoor summer temperatures; the highest ventilation rate shall be used for design. Areas requiring routine maintenance shall be heated in the winter time. Heating and ventilating systems shall filter the outside air. Areas falling outside of NFPA recommendations shall be ventilated at a rate determined by the PDB Company. Personnel facilities shall be mechanically air-conditioned in the summer and heated in the winter, or as required by state and federal code. Control rooms and electrical rooms shall be evaluated for mechanical air conditioning and treatment to remove corrosive constituents from the air, based on the control equipment and staffing requirements. Emergency generator rooms shall be ventilated to limit summer indoor temperature during generator operation. The ventilation system shall be designed to minimize offsite noise impacts. Acoustical louvers and acoustical wall construction shall be considered for the Generator area. The HVAC equipment construction shall be coordinated with its intended use. All non-odor control HVAC equipment shall be constructed or coated to protect against H2S corrosion.

2. Fire Protection
   The PDB COMPANY Work shall include smoke detectors, pull stations and audible/visible communicators meeting the requirements of local Fire Department. Fire protection during construction and operation of the PDB COMPANY Work is the responsibility of the PDB COMPANY. Fire protection shall be provided for areas including the site and all building as required by state and local code and NFPA.

3. Plumbing
   The plumbing systems shall be designed in accordance with the local, state and Federal codes.

4. Water Systems
   Water lines shall be routed to fire protection, toilet and locker facilities and process applications as required. Freeze proof wall hydrants shall be provided at each facility (as many as required) to permit wash down or watering of planting or grounds. Hot water shall be provided for toilet and facilities as necessary and tepid water for the emergency eyewash and showers, as required by code. Emergency eyewash and showers shall be provided at all chemical facilities in accordance with ANSI Z 358.1.
2.7 ELECTRICAL

1. Codes & Standards
   Electrical designs and installation shall comply with all applicable codes and standards.

2. Utility Service
   The PDB COMPANY shall be responsible for making all arrangements with Walton EMC for electrical service.

3. Standby Generation
   Standby Generation system shall be required.

4. UPS Power
   Uninterruptable power systems shall be provided for all equipment that is sensitive to power supply interruptions and disturbances.

5. Power Distribution
   The distribution system shall be designed to limit the steady state voltage drop and the motor starting voltage drop to those values which are accepted as current best practices. Provide a minimum of 20 percent spare capacity in transformers and the busses of switchboards, motor control centers and panelboards.

6. Area Classifications
   The facilities shall comply with NFPA 820 Standard for Fire Protection in Wastewater Treatment Collection Facilities.

7. Grounding
   Grounding shall be provided in accordance with the National Electrical Code. Ground grids shall be provided for all structures as necessary. Existing grounds shall be tied into the new grids. All raceways that contain power conductors at any voltage shall include a ground wire.

8. Surge Protection
   Lightning arrestors and surge capacitors, and transient voltage surge protection shall be provided as good design dictates.

9. Lightning Protection
   All structures shall be provided with lightning protection conforming to NFPA 780 Standard for the Installation of Lightning Protection Systems. A UL Master Label shall be provided certifying compliance with UL standards.

10. Power Monitoring System
    Microprocessor metering units shall be provided at each feeder and motor starter at the medium voltage level, at motor control centers and other significant load centers. The monitoring system shall include a computer driven software package to monitor and trend load which shall be tied into the plant wide SCADA system.
11. Motors
Continuous duty rated motors shall be energy efficient types conforming to the appropriate NEMA standard. Motors driven by variable frequency drives shall be inverter duty type.

12. Lighting
Indoor lighting fixtures shall be LED type unless warranted otherwise. Special attention shall be paid to minimizing sky glow and light trespass on adjoining properties. Lighting levels shall be as recommended by Illuminating Engineering Society but shall be sufficient to illuminate interior areas to provide desirable work lighting. Battery-backed emergency lighting units and illuminated LED exit signs shall be provided where required.

13. Wire and Cable
All conductors shall be copper.

2.8 PROCESS INSTRUMENTATION AND CONTROLS/SCADA SYSTEM

1. Introduction
The PDB COMPANY shall provide, install, program and make fully operational a complete process instrumentation and control/SCADA system, including all hardware and software, to interface with all plant systems and equipment. The PDB COMPANY shall provide a SCADA system that includes the ability to operate and monitor the equipment and processes from a Central Control Station (CCS) and from designated local control panels.

2. Standards
The PDB COMPANY shall provide a process instrumentation and control/SCADA system which complies with the current industry standards and best practices:

2.9 COMMUNICATION SYSTEMS

Systems shall be developed as necessary and be compatible with County standards.

1. CCTV
The PDB COMPANY shall install in accordance with these guidelines a CCTV system with cameras at access and monitoring points on the site and dedicated monitors located as directed by the County. It is intended that the CCTV system be used solely for onsite monitoring.

2. Network Hardware and Software
The PDB COMPANY shall provide, install, and fully implement a comprehensive computer network, which shall be integrated as applicable into the network onsite. The Company shall provide all components with the latest proven technology and that are the manufacturer's latest products. The PDB Company shall work with the County to develop the computer and network integration standards as the project develops.
APPENDIX 3: MINIMUM TECHNICAL REQUIREMENTS

3.1 PROGRESSIVE DESIGN BUILD REQUIREMENTS

The PDB Company shall be responsible for delivery for the County’s acceptance, an expanded plant that
meets all of the requirements of the RFQP as well as any and all Local, State, Federal, regulatory,
applicable law, and County requirements and permits, whether or not indicated in this RFQP.

The PDB Company shall engineer, design, and construct improvements which meets the criteria set forth
in these Appendices. The PDB Company shall develop their own plans and specifications based on the
PDB Company’s own engineering and design, which shall incorporate the County’s Minimum Technical
Requirements. It is anticipated that the County will work with the PDB Company to develop specific
process, equipment and material requirements and preferences during the initial phases of the project,
which shall be incorporated into the minimum technical requirements.

Where the Minimum Technical Requirements do not specify or are incomplete in stating any explicit
quality or standard for construction materials or workmanship, the PDB Company shall use only
workmanship and new materials of a quality consistent with that of construction workmanship and
materials specified elsewhere in the Minimum Technical Requirements, and the Minimum Technical
Requirements are to be interpreted accordingly.

Where there are discrepancies in the PDB RFQP the proposers should use the most stringent specification
or ask for clarification.

3.1.1 Equipment, General Design Requirements

Provide products conforming to all necessary performance requirements including site elevation above
sea level, ambient temperature and humidity range, utility supply conditions, and service pressure-
temperature ratings. Design products for continuous operation unless otherwise noted.

3.1.2 “Or Equal”

The County and County Consultant shall, prior to selection, approve or disapprove any manufacturer,
vendor or specific piece of equipment. The County and County’s Consultant will provide general
guidelines and recommendations on equipment manufacturers and vendors. It is the responsibility of the
PDB Company to evaluate and propose equipment manufacturers and vendors who can and will supply
equipment that meets requirements of this RFQP.

3.2 APPLICABLE CODES AND STANDARDS

Whenever reference is made to conforming to the standards of any technical society, organization, body,
code or standard, it shall be construed to mean the latest standard, code, specification or tentative
specification adopted and published at the time of advertisement of the RFQP. This shall include the
furnishing of materials, testing of materials, fabrication and installation practices. In those cases where the
PDB Company’s quality standards establish more stringent quality requirements, the more stringent
requirement shall prevail. Such standards are made a part hereof to the extent which is indicated or
intended. The inclusion of an organization under one category does not preclude that organization’s standards from applying to another category. All material and equipment, for which a FM or UL Standard, an AGA or NSF approval or an ASME requirement is established, shall be so approved and labeled or stamped. The label or stamp shall be conspicuous and not covered, painted, or otherwise obscured from visual inspection.

3.3 TESTING REQUIREMENTS

In general, where no reference to a requirement is made the requirements shall be, accepted industry standards, codes, or Barrow County Standards shall be used, but in any case, the most strict requirement shall apply.
APPENDIX 4: REPORTS, MEETINGS AND DESIGN SUBMITTALS

4.1 INTRODUCTION

This Appendix sets forth the requirements during the design and construction period for meetings and reports, and for design submittals. All documents or submittals described in this Appendix shall be submitted as complete organized reports (including tables of contents), bound in durable 3-ring binders. The PDB Company shall submit two hard copies of all documents and submittals, except where noted. Any document submitted as a hard copy shall also be submitted in electronic format, such as searchable PDF.

4.2 MONTHLY PROJECT DESIGN AND CONSTRUCTION PROGRESS REPORT

On a monthly basis, following the Contract Date (during the design and construction periods), the PDB Company shall furnish the Owners Representative with a monthly project progress report, in accordance with the Progressive Design Build Contract that summarizes all aspects of the completed month’s work progress.

The Owners Representative will provide timely review and comment on all submittals in accordance with the Progressive Design Build Contract. Failure of the Owners Representative to provide timely comments shall not relieve the PDB Company of any of its performance obligations contained in the Owner/Progressive Design Build Company Contract.

The monthly report shall contain as a minimum, the following:

- Executive Summary. A written narrative of the work completed this period, a description of work to be completed next period, and a description of any critical items, which require immediate resolution.
- Actual cost completed and percent completed. A financial breakdown of the status of the job to date.
- Budgeted Value versus Earned Value of the job to date.
- Project Schedule Updated and annotated
- Submittal Status Log
- Design Drawing Log
- Change Order Log
- Deficiency Log
- Photos
- Engineers/Architects Field Visit Reports
- Safety Reports
- QA/QC Reports
- Public Complaint Status Log
- Major Equipment Procurement Status Log
4.2.1 Videos and Photographs

The use of photographs and videos to document the progress of the PDB Project and the history of the Project is a part of the PDB Company’s responsibility. During the course of the PDB Project the use of photos may well be the only means of verification of the completion of satisfactory work. Also, at the completion of this project the County and the PDB Company would both utilize a photographic history of the project. The PDB Company is encouraged to take as many digital pictures of the project as possible. The requirements of the RFQP for pictures are outline below. All pictures taken on the project whether to fulfill the requirement of the specification or for other reason shall become the property of the County. Access to the picture database will not reasonably be denied the PDB Company.

4.2.1.1 Photographs

All photography (Pre-construction, Post-construction and Progress) for this project shall be in digital format. The PDB Company shall provide the digital camera, the personnel to take the photographs, the labor and computer to transfer the photographs. All photographs shall be submitted via email in digital format with pertinent information provided for each image, including: project name, Contractor’s name, description of subject, orientation, and date and time the picture was taken.

Prior to the beginning of any work, the PDB Company shall take project photographs of the work area to record existing conditions. The Pre-construction Photos shall show all conditions which might later be subject to disagreement shall be shown in sufficient detail to provide a basis for decisions. The pre-construction photographs shall be submitted to the Owners Representative via email within 10 calendar days after the date of the Notice to Proceed.

Post-construction photographs shall be taken after substantial completion and provided prior to acceptance of the project. The post-construction photographs shall be submitted to the Owners Representative via email prior to acceptance and final payment.

As the work progresses, the PDB Company shall provide record photographs of all major components of the construction. The photographs shall be taken as frequently as necessary to provide an appropriate record of the work. Photographic shots shall be submitted with the monthly report. The photographs shall be representative of the primary work being claimed for during the period under consideration. The print selection will be agreed to with the Owners Representative prior to submission. All digital pictures taken shall be submitted monthly via email.

The Owners Representative, the County’s Contract Operator or any appointee by the County will not be hindered from any portion of the work to take photographs or videos of the work being performed.

4.3 DESIGN SUBMITTALS AND REVIEW PROCESS

In accordance with the terms and conditions of the Progressive Design Build Contract, the Owners Representative will review the design for consistency in the Minimum Technical Requirements and the design information submitted with the PDB Company’s Proposal and to provide input on selected issues. The Owners Representative’s input to the design process shall be solicited by the PDB Company on a regular basis, including during design progress meetings and at the key stages in the design preparation.
using the design submittal packages specified below. The Owners Representative may also provide input on constructability, operability, and maintainability issues. The PDB Company shall incorporate the County’s comments or provide in writing why it is not possible to do so.

All submittals are expected to comply with the Minimum Technical Requirements and with the Proposal design information. Any requested exception to the specifications or Progressive Design Build Contract (regardless of prior discussion) must be clearly identified by the PDB Company in its cover letter, which transmits the submittal and must be fully documented with compelling justification for the exception. The PDB Company shall assume all risks associated with assuming that any such requests for exemption will be granted.

4.3.1 Design Changes Requested by the County

The procedures to be followed for incorporating design changes requested by the County are specified in the Progressive Design Build Contract.

4.3.2 Design Submittals

The minimum components of submittal packages that are precedent to key construction and testing activities are listed below. All drawings shall clearly indicate the status of new and existing equipment. The preliminary submittal Protocol envisions that the PDB Company will submit the following design packages. These packages will be reviewed in accordance with this section.

4.3.2.1 Phase 1 Evaluations & Studies

A. Various evaluations of treatment options and sludge handling presented in the DDR. Engineering studies (such as geotechnical investigations, raw water/wastewater analysis, etc.) to support design and cost estimating evaluations.

B. Develop opinion of probable construction cost.

C. In preparing the Phase 1 documents, the PDB shall meet regularly with the Owners Representative to identify various options & refine engineering approach.

D. The PDB Company shall identify and document all permits, building, architectural, landscaping and major equipment requirements in this submittal. It shall also include the Design and Construction Schedule.

E. The PDB Company shall obtain written authorization from Owner prior to proceeding with next phase.

4.3.2.2 Conceptual Design Submittal

A. The PDB Company shall prepare a conceptual design submittal based on the information submitted in response to the proposal. The submittal shall include any modifications that may have occurred during negotiations and shall confirm that the technical requirements as outlined in the PDB RFQP.
This submittal should represent a 30% design with any and all changes made from the original design submitted with the PDB Company’s Proposal clearly identified. The PDB Company shall review and confirm the requirements of the PDB Project in preparing this submittal.

B. In preparing this submittal the PDB Company may meet with the Owners Representative to review any recommendations it may have, after the notice to proceed and prior to the Preliminary Design Submittal. The PDB Company may identify, document and submit for review a value-engineering proposal detailing topics and associated cost adjustments to the PDB Project for review by the Owners Representative.

C. The PDB Company shall identify and document all permits, building, architectural, landscaping and major equipment requirements in this submittal. It shall also include the Design and Construction Schedule.

D. The PDB Company shall submit this to the Owners Representative for review prior to submitting the Preliminary Design Submittal.

4.3.2.3 Preliminary Design Submittal

A. The PDB Company shall make a Preliminary Design Submittal documenting the design concept as proposed, as modified during negotiations and addressing conceptual design submittal review comments. This submittal should represent a design with any and all changes made from the original 30% design submitted with the PDB Company’s Proposal clearly identified. The submittal should include but not be limited to the following:

- Detailed design and construction Schedule.
- Basis of Design Memorandum Outline for each Progressive Design Build task.
- Unit processes and mechanical equipment sizes and dimensions, design criteria-design points and design range.
- Discussion of operational flexibility.
- Discussion of manual bypassing.
- Discussion of plant wide freeze protection.
- Discussion of thermal/heat protection for all mechanical equipment
- Sludge disposal methods.
- Design Drawing List.
- Specification List.
- Preliminary Site Work Plans (Survey, Grading and Drainage Plans if applicable).
- Preliminary Architectural Plans, if applicable.
- Process Flow Schematic and Piping and Instrumentation Diagrams (P&IDs) for all Progressive Design Build requirements.
- Preliminary Mechanical Plans.
- Preliminary Plumbing/HVAC plans.
- Preliminary Electrical Site Plan.
- Electrical One-Line Drawings.
Summary
Estimated Cost of Construction

B. Preliminary Design Documents shall be provided to depict all system equipment and components and their proposed locations.

C. The PDB Company shall provide the Owners Representative with a minimum of two sets of drawings and specifications for review in accordance with sections.

D. The PDB Company shall review the document review comments from the Owners Representative and attend a coordination meeting with the Owners Representative. The PDB Company shall incorporate the Owners Representative’s final review comments into the drawings and respond to Owners Representative’s document review comments in writing following the coordination meeting indicating the final resolution of each comment.

E. If the Owners Representative accepts the Preliminary Design, the Owners Representative shall issue the Notice of Acceptance in writing to the PDB Company.

F. The PDB Company shall develop and recommend a plan for final design and construction activities. The Schedule shall reflect this approach.

G. The PDB Company shall not commence with the work described below without written approval from the Owners Representative.

4.3.2.4 60% Design Review

A. 60% design drawings and specifications shall be prepared to a level of detail sufficient for permitting and construction to begin. It shall reflect all comments from the review of the 30% Preliminary Design Review, Georgia EPD and any other regulatory or governmental review. Documents shall set forth, in detail, the requirements for construction of the work and shall:

1. Develop the intent of the PDB Company’s preliminary design documents in greater detail.

2. Provide information necessary for the use of those in the building trades who shall be constructing the work.

3. Develop documents of sufficient detail as necessary to obtain all required regulatory and permitting agency approvals, if applicable.

4. Include all information to exhibit compliance with previously issued Owners Representative design review comments or written explanation of non-compliance.

5. Include all information to exhibit compliance with Owners Representative design standards.
B. The PDB Company shall issue interpretations of the plans and specifications to the Owners Representative, as requested for clarification of documents.

C. The PDB Company shall submit two sets of Construction Documents to the Owners Representative. Each drawing and cover page of the specifications shall be stamped by professional engineers and/or architects registered in the State of Georgia. The PDB Company may commence construction after submittal of the final design plans and specifications to the Owners Representative and the authority having jurisdiction and approval by the same.

D. The PDB Company shall be responsible to apply for, pay for, and secure all permits, inspections, and review of the Project required by all authorities having jurisdiction prior to and during construction. Permits required may include, but are not limited to, land disturbance and building permits. The PDB Company shall contact any public authority including Barrow County having jurisdiction for application requirements, scheduling, cost, and a checklist of minimum requirements. Deliver one set of approved permit drawings to the Owners Representative.

4.3.2.5 Design Development Progress Submittal

The Company shall make a Design Development Progress Submittal at approximately the 80 percent complete state. At a minimum, this submittal shall include the following, as applicable:

- Final Basis of Design Memorandum;
- Preliminary Architectural Door, Window, Finish, and Hardware Schedules and Details;
- Preliminary Landscape Details and Planting Materials Lists;
- Updated Drawing and Specification Lists;
- Preliminary Piping and Valve Lists;
- Updated Site Work, Grading, Drainage, Landscaping, and Electrical Site Plans;
- Updated Process and Support Facility General Arrangement Plans;
- Preliminary Site Sections and Details;
- Updated Electrical One-Line Drawings;
- Updated Process Flow Piping and Instrumentation Diagrams (P&IDs) for all processes;
- Preliminary Building and Structure Foundation Plans, Floor Plans, and Sections;
- Updated Architectural Plans and Elevations;
- Updated Mechanical Systems Plans, Sections, and Details; and

4.3.2.6 Pre-Final Design Submittal

The Company shall make a Pre-Final Design Submittal for the Progressive Design Build Improvement design package 30 days prior to substantially completion. At a minimum, this submittal shall include the following:

- Final Piping, Valve, Equipment, Landscaping, and Planting Lists;
- Final Civil, Architectural, Landscaping, Structural, Mechanical, Electrical, and I&C Plans,
Sections, and Details;

- Final Process Flow Piping and Instrumentation Diagrams (P&IDs) for all processes, with loop drawings illustrating the functional elements in the path of each sensor to each control system Input/Output (ISA S5.4);
- Final Electrical One-Line Drawings;
- Process, Civil, Structural, Mechanical, and Electrical Design Calculations;

4.3.2.7 Guaranteed Maximum Price for Phase 2 Work

Prior to proceeding with Phase 2, PDB must obtain written authorization to proceed.

4.3.3 Design Submittal Approvals and Consents

Any PDB Company submittal, request, or report for any approval or consent by the County shall be submitted to the Owners Representative with transmittal. The receipt date shall be the date the Owners Representative signs and dates the submittal. All responses, approval or consent shall be given by the Owners Representative in writing and shall be conclusive evidence of such approval or consent, subject only to compliance by the County with the Applicable Law that generally governs its affairs. If the County does not find a request, report or submittal acceptable, the Owners Representative shall provide written response to the PDB Company describing the objections and the reasons for rejection within 30 days of the Owners Representative’s receipt of the submittal. If no response is received within 20 days’ time, the PDB Company shall request in writing from the Owners Representative a response. If after the 30-day time the request, report or submittal has not been answered it shall be deemed rejected and the PDB Company may resubmit the same, with or without modification.

4.3.4 Procedure for County Review of Design Submittals

The following protocol applies for submission of design documents to the County for review and comment which must then be submitted to appropriate Governmental Bodies for approval prior to continued progress in accordance with the published project schedule. All submissions shall be to the Owners Representative with transmittal. The receipt date of the submittal shall be the date the Owners Representative signs and dates the transmittal. The County shall use good faith effort to complete a review of each submittal within 30 days of receipt. The PDB Company shall be notified of any concerns, problems, or non-compliance of such submittal within that time period. However, if the County does not comment on any aspect of a design submittal this lack of comment shall in no way be deemed to be an approval or consent or in any way relieve the PDB Company of full responsibility for the design, construction and performance of the Progressive Design Build work. After 20 days from the date of submittal, the PDB Company shall in writing to the Owners Representative request a response to the submittal. If the County has not responded within that 30-day time period, the PDB Company shall not be prohibited from submitting such design packages to the appropriate Governmental Body for review and approval. The PDB Company shall submit in writing to the Owners Representative at the 30-day point that in accordance with this protocol the submittal is deemed to have been reviewed by the County without comment and that the PDB Company is proceeding in accordance with the published schedule.
4.3.5 100% Design, Permits, Construction & Contract Guarantees and Close-Out

The PDB Company shall complete:

- The Final Design
- Procure all equipment and subcontractors
- Secure all permits required for construction
- Construct the project
- Conduct start up, commissioning and performance testing
- Provide operator training
- Provide warranty coverage
- Submit all close out documents

4.4 DESIGN PROGRESS MEETINGS

The Owners Representative shall have the right but not obligation to attend and participate in the PDB Company’s design progress meetings. These meetings will be conducted at the PDB Company's on site construction office, or at an alternative agreed upon location. The PDB Company shall provide the Owners Representative with at least 72 hours’ notice of the meetings.

The PDB Company shall provide the Owners Representative with a meeting agenda no less than three (3) days prior to the meeting. Meeting minutes shall be prepared by the PDB Company in draft form within five (5) business days following each meeting for Owners Representative review and comment. The Owners Representative’s comments shall be incorporated and final meeting minutes distributed by the PDB Company. The PDB Company shall also provide to the Owners Representative copies of other documentation produced as a result of the meetings.

4.5 PROJECT MEETINGS AND REPORTS

During the construction period the PDB Company shall schedule and administer periodic progress meetings and specially called progress meetings throughout the progress of the work. The PDB Company shall prepare agenda for these meetings, distribute written notice of each meeting three days in advance of the meeting date, and make physical arrangements for the meetings. The PDB Company’s Project Manager shall preside at the progress meetings, record the minutes, including all significant proceedings and decisions. The PDB Company shall reproduce and distribute copies of minutes within three days after each meeting to all participants and to all parties affected by decisions made at the meeting.

Representatives of PDB Company, sub-contractors and suppliers attending the meetings shall be qualified and authorized to act on behalf of the entity each represents.

4.5.1 Pre-construction Meeting

The Owners Representative will designate the location and schedule the kick-off meeting within 15 days after contract execution.
The following parties shall attend the meeting:

1. Public Works Representative.
2. Owners Representative.
3. PDB Company’s Project Manager.
4. PDB Company’s Design Team
5. Major sub-contractors.
7. PDB Company’s Safety Representative
8. PDB Company’s QA/QC Manager.
9. Others, as appropriate.

Suggested Agenda:

1. Introduction of key players (attendees)
2. Designation of responsible personnel
3. Steps to Issuing a Notice to Proceed
4. Safety Issues
5. List of major sub-contractors and suppliers.
6. Major equipment deliveries and priorities.
7. Project Coordination, Critical Work Sequencing.
8. Review of Procedures for:
   a. Field decisions.
   b. Proposal requests.
   c. Submittals.
   d. Change Orders.
   e. Applications for Payment.
   g. Procedures for maintaining Record Documents.
   h. Use of premises:
      i. Office work and storage areas.
      j. Communication Protocol
10. Security procedures.
12. Other Issues

4.5.2 Progress Meetings

During the construction period the PDB Company shall schedule regular periodic meetings (approximately monthly) and shall hold called meetings as required by progress of the work. The meetings shall be held at the field office of the PDB Company or at other locations made available by the PDB Company in consultation with the Owners Representative.
The following parties shall attend the meetings:

1. Owners Representative.
2. PDB Company’s Project Manager, QA/QC Manager, Safety Representative, etc.
3. PDB Company’s Design team
4. Sub-contractor as appropriate to the agenda.
5. Suppliers as appropriate to the agenda.
6. Others as required

Suggested Agenda:

1. Review and approval of minutes of previous meeting.
2. Safety
3. Review of work progress/schedule updates since previous meeting.
4. Field observations, problems, and/or conflicts.
5. Problems which impede Construction.
6. Review of off-site fabrication, delivery schedules.
7. Corrective measures and procedures to regain projected schedule.
8. Planned progress, schedule, during succeeding work period. Look ahead Schedule
9. Review submittal schedules; expedite as required.
10. Review proposed changes orders
11. Unresolved Request for Information
12. Public Complaint Resolution
14. Other Issues.
APPENDIX 5: CONSTRUCTION CONTROL AND FACILITIES

5.1 HOURS OF WORK/CONTROL OF NOISE DURING CONSTRUCTION

The PDB Company shall work between the hours of 7:00 AM and 7:00 PM, Monday through Friday (work hours) but so as to not violate Barrow County Noise Ordinance. Work that must be performed outside of these work hours or an increase in work hours to comply with the project schedule before 7:00 AM or after 7:00 PM or on weekends (Saturday or Sunday) must be requested in writing from the Owners Representative. This includes delivery of material or equipment to the site outside of the normal work hours. It is the policy that when there is work in progress that a member of the Owners Representative team will be present or available within short notice. If work outside of the work hours is required and either a member of the Owners Representatives team must be present or is required for work inspection the PDB Company shall pay for those hours that the individual works.

Notwithstanding the previously set forth work hours, the PDB Company shall be on call 24 hours a day while the project is on-going with no more than a 2-hour response time. The PDB Company will have representative onsite 24 hours a day while the PDB Company is undergoing temporary activities, e.g. bypass pumping, for the complete duration of the temporary activities.

5.2 CONSTRUCTION

In accordance with the terms and conditions of the Progressive Design Build Contract, the Owners Representative shall review construction activities and participate in the construction decision-making process and construction progress meetings, as needed, to verify compliance with the intent of the Progressive Design Build Contract. In addition, the Owner’s Representative will review the progress of construction to verify payment. The monthly design and construction program reports, together with the detailed design and construction Schedule, and the schedule of values of the Progressive Design Build Contract will be reviewed.

5.2.1 Owners Representative Oversight during Construction

The County and the Owners Representative shall have complete access to the site at all times, 24 hours per day, 365 days per year. It is expected that the Owners Representative will have full-time representation at the Site throughout construction, start-up, and Acceptance Testing. The Owners Representative and his designated representatives shall have the right to attend the PDB Company’s construction progress meetings which shall be held at the PDB Company’s on site construction office, or another agreed upon location.

The Owners Representative may issue a Work Deficiency Notice or Notice of Field Observation in the event of unsatisfactory work or performance. The PDB Company shall implement the approved Corrective Action Plan or means acceptable to the Owners Representative to achieve compliance.

The PDB Company shall solicit the Owners Representative’s input to the process on a regular basis. The PDB Company shall provide the Owners Representative with copies of documentation produced as a result of all construction progress meetings.
All personnel accessing the site shall comply with the PDB Company's reasonable operating and safety procedures and rules, and shall not interfere with the PDB Company's work. The parties agree that the County and the Owners Representative shall have immediate access to the site and PDB Work, and no Company rule or procedure shall impede, impair or delay such access.

5.3 REQUEST FOR INFORMATION (RFIs)

The PDB Company can request information to clarify any issue associated with the project. This request can be in the form of a written memo or email. The format of this request will be provided to the PDB Company at the pre-construction meeting. Verbal requests for information are not allowed and will not be honored. A request for information is an official document of the project and a file of RFIs will be maintained. RFIs will be answered by the Owners Representative as rapidly as possible. All RFIs will be answered within 48 hours of receipt or the PDB Company informed of the reason that resolution was not determinable. If the answer to an RFI cannot be determined within the 48-hour time limit, the RFI will become an unresolved issue and placed on the agenda of the next Design Review Meeting or Project Progress Meeting for resolution or clarification. In the Monthly Project Design and Construction Progress Report all unanswered or unresolved RFIs must be listed.

5.4 REQUEST FOR CLARIFICATION (RFCs)

During construction, the PDB Company may request clarification on the construction plan and specifications from the PDB Designer. The format of this request will be provided by the PDB Company at the pre-construction meeting. Copies of all RFC issued by the PDB Company and responded by the Designer shall be provided to the Owners Representative within 24 hours of issuance and response.

5.5 DESIGNER’S CLARIFICATION (DCs)

The PDB Designer may issue clarification on the design associated with the project prior to construction of such work. The clarification shall not in any way change the design approved by the County or other Governmental Bodies and in terms of the requirement of the Progressive Design Build Work. Copies of all DCs issued by the Designer shall be provided to the Owners Representative within 24 hours of issuance.

5.6 SITE CLEANLINESS

This Section covers the general cleaning which the PDB Company shall be required to perform both during Construction and before final acceptance of the Project. In general, the PDB Company shall be responsible for removal from the site, and proper disposal of all debris, material, and waste removed from the plant as part of the PDB Work.

5.6.1 Hazardous Materials and Waste

The PDB Company shall handle hazardous waste and materials in accordance with applicable local, state, and federal regulations. Waste shall also be disposed of in WFPA approved landfills as applicable. The PDB Company shall prevent accumulation of wastes which create hazardous conditions. Burning or burying rubbish and waste materials on the site shall not be allowed. Disposal of hazardous wastes or
materials into sanitary or storm sewers shall not be allowed.

5.6.2 Disposal of Surplus Material

The PDB Company shall legally dispose of off-site all surplus materials and equipment from demolition and shall provide suitable off-site disposal.

5.6.3 Cleaning Materials and Equipment

Provide all required personnel, equipment and materials needed to maintain the specified standard of cleanliness.

5.6.4 Compatibility

Use only the cleaning materials, methods and equipment which are compatible with the surface being cleaned, as recommended by the manufacturer of the material or as approved by the Owners Representative.

5.6.5 Progress Cleaning

Do not allow the accumulation of scrap, debris, waste material and other items not required for construction of this Work. At least each week, and more often if necessary, completely remove all scrap, debris and waste material from the job site. Provide adequate storage for all items awaiting removal from the job site, observing all requirements for fire protection and protection of the environment.

5.6.5.1 Site

Daily and more often if necessary, inspect the site and pick up all scrap, debris and waste material. Remove all such items to the place designated for their storage. Re-stack materials stored on site weekly. At all times maintain the site in a neat and orderly condition which meets the approval of the Owners Representative.

5.6.5.2 Structures

Weekly and more often if necessary, inspect the structures and pick up all scrap, debris and waste material. Remove all such items to the place designated for their storage. Weekly and more often if necessary, sweep all interior spaces clean. "Clean", for the purpose of this subparagraph, shall be interpreted as meaning free from dust and other material capable of being removed by using a hand-held broom. As required preparatory to installation of successive materials, clean the structures or pertinent portions as recommended by the manufacturer of the successive material. Following the installation of finish floor materials, clean the finish floor daily. "Clean", for the purpose of this paragraph, shall be interpreted as meaning free from all foreign material which, in the opinion of the Engineer, may be injurious to the finish floor material. Schedule cleaning operation so that dust and other contaminants resulting from cleaning operations will not fall on wet, recently painted surfaces.
5.6.6 Final Cleaning

Unless otherwise specifically specified, "clean" for the purpose of this section shall be interpreted as the level of cleanliness generally provided by commercial building maintenance sub-contractors using commercial quality building maintenance equipment and materials. General: Prior to completion of the Work, remove from the job site all tools, surplus materials, equipment, scrap, debris and waste.

5.6.6.1 Site

Unless otherwise specifically directed by the Owners Representative, hose down all paved areas on the site and all sidewalks preventing material from entering storm drains or sanitary sewer drains; rake clean other surfaces of the grounds. Completely remove all resultant debris.

5.6.6.2 Structures

Remove all traces of soil, waste material, splashed material, and other foreign matter to provide a uniform degree of exterior cleanliness. Visually inspect all exterior surfaces and remove all traces of soil, waste material, and other foreign matter. Remove all traces of splashed materials from adjacent surfaces. If necessary to achieve a uniform degree of exterior cleanliness, hose down the exterior of the structure. In the event of stubborn stains not removable with water, the Owners Representative may require light sandblasting or other cleaning at no additional cost to the Owner. Visually inspect all interior surfaces and remove all traces of soil, waste material, smudges and other foreign matter. Remove all paint droppings, spots, stains and dirt from finished surfaces. Clean all glass inside and outside. Polish all surfaces requiring the routine application of buffed polish. Provide and apply polish as recommended by the manufacturer of the material being polished.

5.6.7 Post-Construction Cleanup:

All evidence of temporary construction facilities. haul roads, work areas, structures, foundations of temporary structures, stockpiles of excess or waste materials, or any other evidence of construction, as directed by the Owners Representative. Schedule final cleaning as approved by the Owners Representative to enable the Owner to accept the Project.

5.6.8 Restoration of Landscape Damage:

Any landscape feature damaged by the PDB Company shall be restored as nearly as possible to its original condition at the PDB Company's expense. The Owners Representative will decide what method of restoration shall be used.

5.6.9 Cleaning During Owner's Occupancy

Should the Owner occupy the Work or any portion thereof prior to its completion by the PDB Company and acceptance by the Owner, responsibilities for interim and final cleaning of the occupied spaces shall be as determined by the Owners Representative in accordance with the conditions of the contract documents.
5.7 DUST CONTROL

Limit blowing dust caused by construction by applying water or employing other appropriate means or methods to maintain dust control subject to the approval of the Owners Representative.

5.7.1 Protection of Adjacent Property

The PDB Company shall make adequate provision to fully protect the surrounding area and will be held fully responsible for all damages resulting from PDB Company’s operations. Protect all existing facilities (indoors and out) from damage by dust, spray or spills (indoors or out). Protect motors, bearings, electrical gear, instrumentation and building or other surfaces from dirt, dust, welding fumes, paint spray, spills or droppings causing wear, corrosion, malfunction, failure or defacement by enclosure, sprinkling or other dust palliatives, masking and covering, exhausting or containment.

5.8 CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

5.8.1 Work Includes

The work covered includes furnishing all labor, equipment, and materials required for temporary control of construction operations.

5.8.2 PDB Company’s Office

The PDB Company shall maintain an office convenient to the site of the work during the period of construction, at which Project Manager shall be while work is in progress. The size of the office shall be as required for general use and to provide space for project meetings. Furnishings shall be provided as necessary. The office shall be provided with telephone service. Copies of the Contract, Drawings and Specifications and approved shop drawings shall be kept on file at this office for reference at any time. Project Record Documents of these Specifications. Notices, instructions, orders, directions or other communications from the Owners Representative, left at this office, shall be considered as received by the PDB Company.

5.8.3 Construction Managers Field Office/Trailer

The PDB Company shall furnish, equip and maintain an adequate office space exclusively for the use of the Owners Representative and staff. The office shall be separate from the PDB Company’s office and shall be at least 200 square feet of floor area, sealed from the weather, completed and ready for occupancy within 30 days following the Notice to Proceed. The office shall be erected on a location approved by the Construction Manager. The PDB Company shall arrange for the office to be cleaned at least one (1) time every week in a manner acceptable to the Owners Representative. The office shall adequately house Owners Representative staff.

All doors and windows shall be equipped with locking devices to prevent unauthorized entry, and all keys to the door locks shall be loaned to the Owners Representative for his use during the life of the project. The office shall contain adequate heating, air conditioning, and ventilating facilities. Adequate electric lights shall be provided with a wall receptacle on each of the four walls. Functional, totally enclosed water
closet and lavatory shall be provided. An individual, direct-line telephone service, fax, and High Speed DSL shall be located as directed for the exclusive use of the Owners Representative. High Speed DSL, Fax, Telephone service for all calls relation to the Work including long distance, all heat, light, water, and sanitary facilities shall be furnished and paid for by the PDB Company.

The following office furniture and equipment shall be furnished:

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Flat top desk, 2-1/2 x 5 feet, with drawers at each end</td>
</tr>
<tr>
<td>1</td>
<td>Plywood drawing table, 3 feet x 6 feet tilt top with drafting stool</td>
</tr>
<tr>
<td>4</td>
<td>Straight chairs</td>
</tr>
<tr>
<td>1</td>
<td>Four-drawer, legal size steel filing cabinet with lock and key</td>
</tr>
<tr>
<td>1</td>
<td>Large metal waste basket</td>
</tr>
<tr>
<td>1</td>
<td>Rack from which to hang drawings, including related appurtenances</td>
</tr>
<tr>
<td>1</td>
<td>Electric water cooler with bottle water supply and disposable drink cups</td>
</tr>
<tr>
<td>1</td>
<td>Tilt/swivel type desk chair</td>
</tr>
</tbody>
</table>

On completion of the project, the field office and equipment shall be removed from the site.

The PDB Company shall erect a sign at the Project site identifying the Project. The sign shall be erected within ten (10) days after the Notice to Proceed and shall contain information in accordance with the Owners Representative’s direction. The project sign and sign panel shall be furnished, erected, and maintained by the PDB Company at the location designated by the Owners Representative. Wording and colors shall be as directed by the Owners Representative. The removal of the project sign from the construction site by the PDB Company shall be at the completion of the PDB Work, when ordered by the Owners Representative.

5.8.4 Temporary Facilities

The PDB Company shall provide all temporary facilities for water, heat, electric light, and power as required for the work during the entire period of operations. PDB Company shall be responsible for payment of utilities costs for the duration of construction. The PDB Company shall provide temporary toilets as required and shall maintain them in a sanitary condition for the duration of the work and remove them at completion. On or before the completion of the work, the PDB Company shall remove all temporary facilities, together with all rubbish and trash, as directed by the Owners Representative.

5.8.5 Storage

The PDB Company shall secure adequate storage to accommodate the required equipment, vehicles, and materials for the period of performance of the Contract.

5.8.6 Construction Utilities

The PDB Company shall pay all power company installation and use charges for the electrical energy utilized for the construction related power and light. The PDB Company shall make his own arrangements at his own expenses for obtaining the water supply necessary for construction purposes, and he shall pay for all water consumed during construction.
5.8.7 Temporary Buildings/Trailers

The PDB Company may build temporary buildings or other structures for housing personnel, tools, machinery and supplies at approved sites, and shall maintain their surroundings in a sanitary and satisfactory manner at all times. On or before the completion of the work, all such structures shall be removed, together with all rubbish and trash, at the expense of the PDB Company.

5.8.8 Temporary Facility Removal

The PDB Company shall remove temporary facilities from the site of the work when so notified by the Owners Representative. All Temporary Facilities have to be removed from the site area for the project to be “complete”. Adequate retainage will be held back after the project is “substantially complete” to ensure that all temporary facilities are removed.

5.8.9 Maintenance During Construction

The PDB Company shall maintain, at his expense, the work during construction and until final acceptance of all work under the Contract. In the event the PDB Company fails to remedy any unsatisfactory situation, within twenty-four hours after receipt of written notice from the Owners Representative describing the unsatisfactory conditions, the Owners Representative may be immediately proceed with adequate forces and equipment to maintain the project, and the entire cost of this maintenance will be deducted from the monies otherwise due the PDB Company under the Contract. As an alternative to the above specified maintenance, the cost of all of the items which are not properly maintained may be deducted at the Contract Prices from the current partial payment request even if such items have been paid for in previous estimates.

5.8.10 Traffic Controls

The PDB Company shall provide all signs, barriers, markers, and flagmen as required to maintain traffic. The PDB Company shall maintain traffic at all times, as practicable. No road shall be closed to traffic. Open trenches adjacent to traveled rights-of-way shall be properly bridged or otherwise maintained safe for traffic.

5.8.11 Access Roads and Construction Entrance

Streets, road and drives used by the PDB Company for access to and from the site of the work shall be protected from damage caused by the normal traffic of vehicles used for or in connection with construction work. Any such damage done shall be repaired immediately and left in good condition at the end of the construction period. Any new access road construction shall be all weather and have drainage structures placed as shown or as required.

5.8.12 Pumping

The PDB Company shall furnish and operate pumping and appurtenant piping for dewatering, flow rerouting, or any similar purposes. Pumping equipment which could disturb the public shall be operated only during a standard work day or as approved by the Owners Representative. No discharge of chemicals,
raw sewage, or other process liquid will be permitted to area water courses under any circumstances.

5.8.13 Pavement Restoration

The PDB Company shall restore in a neat and acceptable manner all streets, roadways, or other areas where trenches have been opened. Bituminous concrete, and prime and seal paving shall be restored so that the wearing surface and base course shall each be one and one-half times the original thickness. Gravel surfacing shall be restored to its original thickness with a size gravel to match the existing, but in no case shall restored surfacing be less than 4 inches.

The PDB Company shall restore concrete curbs, gutters, and walks to the size and shape as were existing. Damaged sections shall be replaced with complete, new sections. Patching of damaged sections will not be permitted.

5.8.14 Tree and Plant Protection

The PDB Company shall preserve and protect existing trees and plants at the site which are designated to remain and those adjacent to the site. Temporary barriers to a height of six feet shall be provided around each tree, or around each group of trees, or around plants to be protected. The PDB Company shall carefully supervise excavating, grading and filling, and subsequent construction operations to prevent damage. The PDB Company shall consult with the Owners Representative and remove those roots and branches which interfere with construction. The PDB Company shall replace, or suitably repair, trees and plants designated to remain, which have been damaged or destroyed due to construction operation. Reasonable care shall be taken during construction to avoid damage to vegetation. Ornamental shrubbery and tree branches shall be temporarily tied back, where appropriate, to minimize damage. Trees which receive damage to branches shall be trimmed of those branches to improve the appearance of the tree. Tree trunks receiving damage from equipment shall be treated with a tree dressing.

5.8.15 Soil Erosion

The PDB Company shall be required to take the necessary steps to minimize siltation and soil erosion during construction. The PDB Company shall be required to obtain and comply with all the requirements of a Land Disturbance Permit (LDP). This work shall consist of furnishing all labor, equipment, and materials and performing all operations in connections with the construction, installation, and maintenance of all erosion and pollution controls through the use of berms, sediment basins, mulches, hay erosion checks, ditches, debris filters, and other devices. Temporary pollution control shall be coordinated with the permanent landscape program to assure economical, effective and continuous erosion control throughout the construction period.

5.9 JOB SITE SECURITY

5.9.1 Site Security - Pertaining to and around the PDB Work

The PDB Company shall be responsible for all site security that encompasses that portion of the work being undertaken by the PDB Company until the PDB Work is turned over to the County. The PDB Company shall guard against and be responsible for all damage or injury to such properties caused by
trespass, negligence, vandalism or malicious mischief of third parties, and shall provide for safe and orderly vehicular movement. The PDB Company shall also be liable for any injury to any personnel on site which caused by negligence in the performance of the PDB Work. The PDB Company shall insure that only authorized personnel have access to the site and that all personnel follow safety requirements. The PDB Company shall furnish and erect such barricades, fences, lights and danger signals and shall provide such other precautionary measures for the protection of persons or property and of the PDB Work as necessary.

From sunset to sunrise, the PDB Company shall furnish and maintain at least one light at each barricade and sufficient numbers of barricades shall be erected to keep vehicles from being driven on or into any PDB Work under construction.

The PDB Company will be held responsible for all damages to the PDB Work due to failure of barricades, signs and lights and whenever evidence is found of such damage, the PDB Company shall immediately remove the damaged portion and replace it at the PDB Company’s cost and expense. The PDB Company’s responsibility for the maintenance of barricades, signs and lights shall not cease until the Project has been accepted by the Owner.

The PDB Company shall employ, when necessary, watchmen on the work and shall, when necessary, erect and maintain such strong and suitable barriers and such light as will effectively prevent the happening of any accident to health and/or property. Lights shall be maintained for the hours between sunset to sunrise. Installation of lighting shall be by an approved plan submitted to the Owners Representative.

5.9.2 Safety

The PDB Company shall maintain the safety of the site that encompasses that portion of the work being undertaken by the PDB Company at a level consistent with the Contract Standards. Without limiting the foregoing, the PDB Company shall: (1) take all reasonable precautions for the safety of, and provide all reasonable protection to prevent damage, injury or loss by reason of or related to the operation of the Managed Assets to, (a) all employees working at the Managed Assets and all other persons who may be involved with the operation, construction, maintenance, repair and replacement of the Managed Assets, (b) all visitors to the site, (c) all materials and equipment under the care, custody or control of the PDB Company on the Site, (d) other property constituting part of the site or PDB Work, and (e) County Property; (2) establish and enforce all reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards and promulgating safety regulations; (3) give all notices and comply with all Applicable Law relating to the safety of persons or property or their protection from damage, injury or loss; (4) designate a qualified and responsible employee at the site whose duty shall be the supervision of plant safety, the prevention of fires and accidents and the coordination of such activities as shall be necessary with federal, State and County officials; (5) operate all equipment in a manner consistent with the manufacturer's safety recommendations; (6) provide for safe and orderly vehicular movements; and (7) develop and carry out a Site-specific safety program including employee training and periodic inspections. The PDB Company shall not implement safety plans, procedures, environments, devices, etc. that are less stringent or less safe than those in place or that would be less stringent than those required by the County and/or Contract Operator.
5.9.3 OSHA

The PDB Company shall make all modifications to the site and PDB Work and take all other actions which may be required in order to ensure that the site and PDB Work are in compliance with the Occupational Safety and Health Act as in effect on the Contract Date at the cost and expense of the PDB Company. Any amendments to the Occupational Safety and Health Act which take effect after the Contract Date shall constitute a Change in Law.

5.10 RECORD DRAWINGS, SHOP DRAWINGS

The PDB Company shall maintain at the site and provide the Owners Representative with record design and construction documents including calculations, engineering analyses, modeling results, design reports, drawings, specifications, addenda, approved shop drawings, samples, photographs, change orders, other modifications of contract documents, test records, survey data, field orders and all other documents pertinent to the project. Record documents shall be available at the site at all times for inspection by the Owners Representative and its representatives. Drawings shall note all changes made during construction including, but not limited to:

- The Drawings shall be electronically updated with Record Drawings.
- Depth of various elements of foundation in relation to datum.
- Horizontal and vertical locations of underground utilities and appurtenances referenced to permanent surface improvements.
- Location of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of structure.
- Dimensions and details of field changes.
- Changes made by change order or field order.
- Details not on original drawings and other elements not originally specified.

Upon completion of all construction work, the PDB Company shall submit to the Owners Representative three (3) sets of record design drawings in a format as directed and approved by the Owners Representative, including a set of design notebooks. The notebooks shall include calculations, engineering analyses, modeling results and design reports. The PDB Company shall provide plans, in the AutoCAD Release requested by the Owners Representative, a set of design drawings and specifications for each Progressive Design Build requirement, modified to clearly and accurately show all changes made during the construction. These drawings shall be designated in the revision block as “construction record” drawings and shall be checked by the design engineer(s) responsible for the original design verifying that the field changes shown are accurate and consistent with the design intent. Construction record drawings shall be submitted to the Owners Representative no later than 30 days prior to final Acceptance Test.

5.11 REFERENCE STANDARDS

5.11.1 Applicability of Standards

Where reference is made to standards or specifications published by various organizations (“standards”), the Work shall conform to latest edition of such standards as amended and revised in effect at the date of Contract, unless a specific date is indicated.
Where material is designated for certain applications, material shall conform to standards designated in the applicable building code governing the Work. Similarly, unless otherwise specified, installation methods and standards of workmanship shall also conform to standards required by such code. Where no particular material is specified for a certain use, the Progressive Design Builder shall select from choices offered in the governing code.

Where a standard does not provide all information necessary for the complete installation of an item, comply with manufacturer's instructions for installation and workmanship.

Where specific articles, sections, divisions or headings for standards are not given, such standards shall apply as appropriate. Standards when included in the Contract Documents by abbreviations or otherwise shall form a part of Contract Documents. In the event of conflicts between cited standards and/or the Contract Documents, the more stringent shall govern.

5.11.2 Abbreviations and Acronyms

Abbreviations and acronyms used throughout the Contract Documents refer to associations, institutes, societies and other public bodies who publish standards which are readily available to the public, and to the titles of the standards which they publish. Where such abbreviations or acronyms are used in the Contract Documents, they shall mean the recognized name of the trade association, standards-generating organization, authority having jurisdiction, or other entity applicable to the context of the text provision. Refer to the "Encyclopedia of Associations," published by Gale Research Co., available in most libraries.

Whenever initials representing such a body are shown, followed by a number or a combination of numerals and letters, reference is to a particular standard to which Progressive Design Builder shall conform. The number or combination of numerals and letters following abbreviation designates the particular standard to be followed.

5.11.3 Progressive Design Builder’s Duties and Responsibilities

The Progressive Design Builder shall be responsible when required by Contract Documents, or upon written request from the Owners Representative, to deliver required proof that materials or workmanship, or both, meet or exceed the requirements of a reference standard.

5.11.4 Conflicting Standards

Where compliance with two or more standards is specified and where the standards may establish different or conflicting requirements for minimum quantities or quality levels, refer requirements that are different but apparently equal and other uncertainties to the Owners Representative for a decision before proceeding.

5.11.5 Copies of Standards

Each entity engaged in construction on the Project is required to be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract
Documents. Where copies of standards are needed to perform a required construction activity, the Progressive Design Builder shall obtain copies directly from the publication source.

5.12 MAINTENANCE OF OPERATIONS DURING CONSTRUCTION

5.12.1 The Requirement

The existing facility will be maintained in continuous operation by the County’s Contract Operator during the entire construction period. In performing the PDB Work, the PDB Company shall plan and schedule his work so as not to impede any plant operation and in order to meet the plant’s operating requirements. Maintaining the treatment processes to ensure all requirements of the NPDES permit are met is the first priority. No spilling of chemicals, raw wastewater or other process water shall be allowed. The PDB Company shall pay all civil penalties, costs assessments, fines, etc., associated with any spill, or permit violation attributable to the PDB Work.

The PDB Company shall be responsible for coordinating the general construction and electrical, HVAC, plumbing, instrumentation and control schedules and for ensuring that permanent or temporary power is available for all existing, proposed, and temporary facilities that are required to be on line at any given time.

5.12.2 General Constraints

The PDB Company shall design and construct the PDB Work so that the facility is maintained in continuous operation with a minimum disruption. All plant operations shall be maintained in continuous operation during construction period except during approved interruptions. All short-term system or partial systems shutdowns and diversions shall be approved by the Owners Representative. Long term shutdowns and diversions shall conform to the requirements of Plant Operation and Applicable Laws and shall be minimized by the PDB Company as much as possible. If in the judgment of the Owners Representative a requested shutdown is not required for the PDB Company to perform the work, The PDB Company shall utilize approved alternative methods to accomplish the work. All shutdowns shall be coordinated with and scheduled at times suitable to the County and County Contract Operators. Shutdowns shall not begin until all required materials are on hand and ready for installation. Each shutdown period shall commence at a time approved by the Owners Representative, and the PDB Company shall proceed with the work continuously, start to finish, until all work is completed and normal facility operation is restored. If the PDB Company completes all required work before the specified shutdown period has ended, the Owners Representative may immediately direct the Contract Operator to place the existing system back into service.
APPENDIX 6: PROJECT SCHEDULE AND PAYMENT

6.1 INTRODUCTION

This Section describes the Progressive Design Build Scheduling and progress reporting requirements of the Contract. The primary objectives of the requirements are:

1. To insure adequate planning and execution of the PDB Work by the PDB Company;
2. To assist the County and Owners Representative in evaluating the progress of the PDB Work;
3. To provide for optimum coordination by the PDB Company of its sub-contractors, trades, and suppliers, and of its PDB Work with the work or services provided by the County or any separate contractors; and
4. To permit the timely prediction or detection of events or occurrences which may affect the timely prosecution of the PDB Work.
5. To provide for a basis of progress of work for invoicing and payment to PDB Company.

Contract Term

The PDB Contract will have a Term that is contained in Section 2.7. This term is the maximum time that the PDB Contract is in effect and constitutes the maximum period of time during which the PDB Work can be accomplished and completed without change order. The PDB Company shall prepare their detailed Progressive Design Build Schedule to be less than or equal to the term of the PDB Contract.

6.2 GENERAL SCHEDULING REQUIREMENTS

A. The PDB Work of this Contract shall be planned, scheduled, executed, and reported using the critical path method (CPM). The PDB Company shall use one of the following software programs to develop its detailed Progressive Design Build Schedule:

1. Microsoft Project, latest version
2. SureTrak Project Manager, latest version
3. Primavera Project Scheduler, latest version

B. The detailed Progressive Design Build Schedule shall represent the PDB Company’s commitment and intended plan for completion of the PDB Work in compliance with the PDB Contract completion date and interim milestone dates specified. The detailed Progressive Design Build Schedule shall take into account all foreseeable activities to be accomplished by any separate Contractors or the County, and interface dates with utility companies, the County’s operations, and others. The detailed Progressive Design Build Schedule shall anticipate all necessary manpower and resources to complete the PDB Work within the dates set forth.

C. Once approved by the Owners Representative, the detailed Progressive Design Build Schedule will become the Baseline Schedule and Schedule of Record for coordinating the PDB Work, scheduling the PDB Work, monitoring the PDB Work, reviewing the progress payment requests, evaluating time extension requests, and all other objectives listed above.
D. The PDB Company is responsible for determining the sequence of activities, the time estimates of the detailed construction activities and the means, methods, techniques and procedures to be employed. The detailed Progressive Design Build Schedule shall represent the PDB Company’s best judgment of how it will prosecute the Work in compliance with the Contract requirements. The PDB Company shall ensure that Detailed Progressive Design Build Schedule is current and accurate and is properly and timely monitored, updated and revised as Project conditions and the Contract Documents may require.

E. When there are separate contractors working concurrently on the Project whose work must interface or be coordinated with the PDB Work of the PDB Company, the PDB Company shall coordinate its activities with the activities of the separate contractors, and the Detailed Progressive Design Build Schedule shall take into account and reflect such work by others.

F. The PDB Company shall be solely responsible for expediting the delivery of all materials and equipment to be furnished by it so that the progress of construction shall be maintained according to the currently approved Progressive Design Build Schedule for the PDB Work. The PDB Company shall notify the Owners Representative in writing, and in a timely and reasonable manner, whenever the PDB Company determines or anticipates that the delivery date of any material or equipment to be furnished by the PDB Company will be later than the delivery date indicated by the currently approved Progressive Design Build Schedule, or required consistent with the completion requirements of this Contract, subject to schedule updates as herein provided.

6.3 DETAILED PROGRESSIVE DESIGN BUILD SCHEDULE

A. Initial PDB Schedule was submitted with the successful PDB Company’s proposal in response to the PDB RFQP. Within 14 days after the Notice to Proceed, the PDB Company shall submit a detailed Progressive Design Build Schedule according to the requirements. The Owners Representative will review the Progressive Design Build Schedule and will return the reviewed copy within the time-period specified for submittals. If required, the PDB Company shall resubmit schedule to the Owners Representative making any required revisions within ten (10) days following the return date, and then again similarly for all such partial approvals and the final approval.

B. The detailed Progressive Design Build Schedule shall consist of a time-scaled, detailed network graphic representation of all activities that are part of the PDB Company’s construction plan and an accompanying listing of activity’s dependencies and interrelationships. The detailed Progressive Design Build Schedule submission shall include, but not be limited to, the following information:

1. Project name.
2. The PDB Work shall be divided into logical and identifiable subdivisions called activities. All activities will be assigned to a Milestone. The total cost of all the work represented by all the Milestones shall equal the Fixed Progressive Design Build Price. Work shall be further subdivided into Activities as defined below. Activities cost will be subtotaled to a Milestones cost, with the total cost of all the activities under a specific Milestone being equal or less than the value as indicated on PPF2.
3. Activities for all aspects of the Work, with durations not exceeding fourteen (14) calendar days
   for all activities for which the Progressive Design Builder will perform actual design or
   construction work. Material procurement, submittals, concrete curing and other similar
   activities may exceed fourteen (14) calendar days if approved by the Owners Representative.
   Related activities, each of duration of five (5) calendar days or less, may be shown as one
   activity together, if not on the critical path of timely job completion.

4. The Progressive Design Build schedule shall indicate the Critical Path for the PDB Work. This
   can be accomplished on the Progressive Design Build schedule, on a separate schedule.

5. Outage schedules for existing utility services, if any, that will be interrupted during the
   performance of the Work

6. Acquisition and installation of equipment and materials supplied and/or installed by the County
   or separate contractors

7. All start dates, milestones, float and completion dates

8. An accounting of the number of workdays anticipated to be lost due to weather. This
   accounting shall be in accordance with allowable days per month provided elsewhere in the
   Contract Documents.

9. A tabular report listing all predecessor and successor activities for each activity

10. A legible time scaled network diagram

11. A listing of the project calendar, indicating the anticipated days of work performance

C. All Milestones and Activities are to appear on the detailed Progressive Design Build Schedule
   shall include, but not be limited to, preliminary construction activities, pre-construction meetings,
   site work, structure erection, roof close-in, exterior wall systems, paving, major material
   fabrication and delivery, shop drawings submittals, bi-weekly progress meetings, furniture
   delivery and installation, equipment delivery and installation, coordination requirements, mock-
   up installations and inspections, dates of Substantial and Final Completion, Certificate of
   Occupancy inspection, systems testing and instruction, and special County decision points that
   impact the Work.

D. Schedule Reports: Schedule submissions will contain the following minimum information for each
   activity:
   1. Activity number, description and estimated duration
   2. Anticipated start and finish dates
   3. Responsibility for activity
   4. The cost loading values for each activity.

E. For all major equipment and materials to be fabricated or supplied for the Project, the Detailed
   Progressive Design Build Schedule shall show a sequence of activities including:
   1. Preparation of shop drawings and sample submissions
   2. A reasonable time for review of shop drawings and samples or such time as specified in the
      Contract Documents
   3. Shop fabrication, delivery and storage
   4. Erection or installation
   5. Testing of equipment and materials.

F. The PDB Company shall submit, as a part of the data submitted to Owners Representative, a
narrative report indicating the anticipated allocation by the PDB Company of the following resources and work shifts for each activity which he proposes to be utilized on the Project:
1. Labor resources;
2. Equipment resources; and
3. Whether it proposes the Work to be performed on single, double or triple shifts, and whether it is to be done on a 5-, 6- or 7-day work week basis. (see work hours)

G. The Owners Representative shall have the right to require the PDB Company to modify any portion of the PDB Company’s Detailed Progressive Design Build Schedule, or Recovery Schedule, including cost loading with the PDB Company bearing the expense thereof, which the Owners Representative reasonably determines to be:
1. Impractical;
2. Based upon erroneous calculations or estimates;
3. Unreasonable;
4. Not in compliance with other provisions of the Contract Documents;
5. Required in order to ensure proper coordination by the PDB Company of the PDB Work of its sub-contractors and with the work or services being provided by any separate contractor;
6. Necessary to avoid undue interference with the County’s operations or those of any utility companies or adjoining property owners;
7. Necessary to ensure completion of the PDB Work by the milestone and completion dates set forth in the Contract Documents;
8. Required in order for the PDB Company to comply with the requirements of this Appendix or any other requirements of the Contract Documents; or
9. Not in accordance with the PDB Company’s actual operations.

6.4 BASELINE SCHEDULE

A. Upon final approval, the detailed Progressive Design Build Schedule shall be used as a Baseline Schedule. The Baseline Schedule will be change only under the following circumstances after review and approval of the Owners Representative.
1. An approved Change Order to the PDB Work, which constitutes an adjustment to the original scope of work and requires additional time to complete. The baseline schedule will be change to reflect the additional time of the change order.
2. Unavoidable delays, not the fault of the PDB Company, contained in a time- only approved Change Order. The baseline schedule will have the additional time added to the schedule.
3. A Change Order approved by the County that has an additional time extension.
4. A request by the PDB Company for a revision to the Detailed Progressive Design Build Schedule that does not extend the Acceptance Date beyond the term of the Contract.

B. It should be noted that delays attributed to the PDB Company or failure of the PDB Company to make major milestones that require a subsequent recovery schedule does not change the baseline (original) schedule, if the schedule has not been modified as a result of a change order or during the term of the contract. Recovery schedules, when required, will be used until the project regains the baseline schedule or until the PDB Work is completed, the term of the contract reached or the contract terminated. The baseline schedule remains the baseline unless changed by an approved change order or is revised and equals the term of the contract.
6.5 SCHEDULE OF VALUES

As part of the submission of the detailed Progressive Design Build Schedule, the PDB Company shall submit a breakdown of the expected value of each of the schedule activities for which payment will be requested. Activities shall roll-up into Milestones. The Milestones shall be the same as the items listed in the Cost Proposal Summary and other activities as necessary in the PDB Company’s proposal in response to the PDB RFQP. The total cost for all Milestones is to be equal to or less than the Progressive Design Build GMP. The cost breakdown of the detailed Progressive Design Build Schedule shall have a direct correlation to the Schedule of Values to be used as the basis for Applications for Payment.

6.6 UPDATING OF PROGRESSIVE DESIGN BUILD SCHEDULE – DESIGN AND CONSTRUCTION PROGRESS REPORTS

A. The PDB Company shall submit for the monthly progress report and for all payment requests an update of the PDB Schedule. The Owners Representative will review the PDB Schedule contained in the Design and Construction Progress Report or payment request to determine the PDB Company’s actual progress. Prepared by the PDB Company, said schedule updates shall set forth current and accurate progress data and shall be based upon the PDB Company’s best judgment. Said schedule updates shall be prepared by the PDB Company in consultation with all principal sub-contractor and suppliers.

B. The updated Schedule shall show the activities, or portions of activities, completed during the reporting period, the actual start and finish dates for these activities, remaining duration and/or estimated completion dates for activities currently in progress, and quantities of material installed during the reporting period. The Owners Representative will produce a computerized update worksheet for the PDB Company to complete as a part of this process.

C. At the monthly progress meeting, a total review of the Project will take place including but not limited to, the following:

2. Anticipated detailed construction activities for the subsequent report period
3. Critical items pending
4. PDB Company’s requested changes to the detailed Progressive Design Build Schedule. These changes shall be accompanied by a change order to the scope of work and term or a change order to the term only.

D. The PDB Company shall submit a narrative with the progress report which shall include, but not be limited to, a description of problem areas, current and anticipated delaying factors and their impact, explanations of corrective actions taken or planned, any proposed newly planned activities or changes in sequence, and proposed logic for a Recovery Schedule, if required, as further described herein. The report shall also include:

1. A narrative describing actual PDB Work accomplished during the reporting period
2. A list of major construction equipment used on the Project during the reporting period
3. The total number of men by craft actually engaged in the Work during the reporting period,
with such total stated separately as to office, supervisory, and field personnel.

4. A manpower and equipment forecast for the succeeding thirty (30) days, stating the total number of men by craft, and separately stating such total as to office, supervisory and field personnel.

5. A list of PDB Company supplied materials and equipment, indicating current availability and anticipated job site delivery dates.

6. Anticipated changes or additions to PDB Company’s supervisory personnel.

E. As part of the updating process, the Owners Representative will calculate, based upon progress data provided by the PDB Company and agreed to by the Owner’s Representative, the value of Work completed based on the sum of the cost loading amounts for all activities, including activities specifically defined for stored materials, less the amount previously paid. Summation of all values of each activity less the appropriate percent of retainage shall be the maximum amount payable to the PDB Company, provided that the PDB Company has complied with all requirements of the Contract Documents.

6.7 RECOVERY SCHEDULE

A. Should the updated detailed Progressive Design Build Schedule, at any time during the PDB Company’s performance, show, in the sole opinion of the Owners Representative, that the PDB Company is fourteen (14) or more days behind schedule for any milestone or completion date for any location or category of work, the PDB Company, at the request of the Owners Representative, shall prepare a Recovery Schedule within 5 days, at no additional cost to the County (unless the County is solely responsible for the event or occurrence which has caused the schedule slippage), explaining and displaying how the PDB Company intends to reschedule its PDB Work in order to regain compliance with the detailed Progressive Design Build Schedule.

B. The PDB Company in preparing a recovery schedule shall prepare and submit to the Owners Representative a Recovery Schedule, incorporating the best available information from sub-contractors and others that will permit a return to the Detailed Construction (baseline) Schedule at the earliest possible time. The PDB Company shall prepare a Recovery Schedule to the same level of detail as the detailed Progressive Design Build Schedule. The Recovery Schedule shall be prepared in coordination with other separate contractors on the Project.

C. Within two (2) days after submission of the Recovery Schedule to the Owners Representative, the PDB Company and any of the necessary sub-contractors, suppliers, vendors, manufacturers, etc. shall participate in a conference with the Owners Representative to review and evaluate the Recovery Schedule. Each of the participants will give a written commitment to comply with the Recovery Schedule. Within two (2) days of the conference, the PDB Company shall submit the revisions necessitated by the review for the Owners Representative’s review and approval. The PDB Company shall use the approved Recovery Schedule as its plan for returning to the detailed Progressive Design Build Schedule.

D. The PDB Company shall confer continuously with the Owners Representative to assess the effectiveness of the Recovery Schedule. As a result of these conferences, the Owners Representative will direct the PDB Company as follows:
1. If the Owners Representative determines the PDB Company continues behind schedule, the Owners Representative will direct the PDB Company to prepare a Schedule Revision. If the submitted Schedule Revisions will exceed the term of the PDB Contract then the PDB Company must also submit a change order request. This change order request will be for the amount of time the project has been delayed. All conditions affecting the requested change order and liquidated damages or construction claims that might arise from the delay, or from the change order must be included in the Change Order request.

2. If the Owners Representative determines the PDB Company has successfully complied with provisions of the Recovery Schedule, the Owners Representative will direct the PDB Company to return to the use of the approved detailed Progressive Design Build Schedule.

6.8 SCHEDULE REVISIONS

A. If the PDB Company cannot recover the detailed Progressive Design Build Schedule via the Recovery Schedule then the PDB Company must prepare a Schedule Revision and if this revision extends the detailed Progressive Design Build Schedule beyond the term of the PDB contract, a request for a Change Order must be submitted. If the Schedule extends beyond the term of the contract the Owners Representative can approve the revision that now becomes the new Detailed Progressive Design Build Schedule and Baseline. If the Term of the Contract is exceeded then a Change Order request must be submitted and the schedule revision with reasons for the delay. If the delay is the fault of the PDB Company then only the detailed Progressive Design Build Schedule is revised with the Baseline remaining unchanged. If the delay is County’s fault or request or an uncontrollable circumstance then the detailed Progressive Design Build Schedule and baseline will be revised following approval of the Change Order. Change Orders within Barrow County can take several months. The requests for a Change Order must be well thought out and analyzed to ensure that all delays are requested and documented.

B. Requests for revision will be accompanied by evidence acceptable to the Owners Representative that the PDB Company's suppliers, and sub-contractor are in agreement with the proposed revisions. If there are separate contractors on the Project, the approval of the separate contractors shall be obtained to make the proposed schedule revisions. If accepted by the Owners Representative and County, the revisions shall be binding upon the PDB Company and all separate contractors on the Project.

6.9 FLOAT TIME

A. Float or slack time associated with one chain of activities is defined as the amount of time between earliest start date and latest start date or between earliest finish date and latest finish date for such activities, as calculated as part of the currently approved Progressive Design Build Schedule. Float or slack time shown on the currently approved Progressive Design Build Schedule is not for exclusive use or benefit of either the County or the PDB Company and is available for use by either of them according to whichever first needs the benefit of the float to facilitate the effective use of available resources and to minimize the impact of Project problems, delays, impact, acceleration or changes in the Work which may arise during performance. The PDB Company
specifically agrees that the County or Owners Representative in conjunction with their review activities or to resolve Project problems may use float time. The PDB Company agrees that there will be no basis for any modification of the milestone or completion dates or an extension of the Contract Time, or a claim for additional compensation as a result of any Project problem, delay, impact, acceleration, or change order which only results in the loss of available float on the currently approved Progressive Design Build Schedule.

B. Float time shown on any Progressive Design Build Schedule shall not be used arbitrarily by the PDB Company in a manner, which, in the opinion of the Owners Representative, unnecessarily delays separate contractors from proceeding with their work in a way which is detrimental to the interests of the County

6.10 PAYMENT

A. The invoicing process is defined in the PDB Agreement and nothing in this Appendix is meant to be in conflict with the PDB Contract. Any inconsistencies between this appendix and the PDB Contract, the PDB Contract shall prevail.

B. **There shall be no payment to the PDB Company prior to the Progressive Design Contract being executed.** All monthly payments invoiced by the PDB Company to the County shall be based on Completion of the Progressive Design Build Work in accordance with the cost Loaded Design and Progressive Design Build Schedule and Schedule of Values.

C. For a payment submittal to be accepted by the Owners Representative all the conditions as defined in the PDB Agreement must be met by the PDB Company. Failure to meet these requirements constitutes non-submittal of the payment request.

D. With each payment submittal the PDB Company must include:

1. A reasonably detailed description of all PDB Work actually completed during the period of the payment submittal
2. Invoices for equipment installed or stored onsite
3. An up-to-date and annotated Progressive Design Build Schedule which shall reflect the status of the PDB Company’s design and Progressive Design Build Schedule since the date of the last payment submittal
4. An up-to-date and annotated Schedule of Values indicating the percentage of Work completed by activity and milestone for the project.
5. Revisions to the critical path schedule which shall reflect changes in the critical path schedule since the date of the last payment submittal.
6. Notice of any liens or “Encumbrances which have been filed, together with evidence that the PDB Company has boned or discharged such liens or encumbrances
7. Any other documents or information relating to the Progressive Design Build Work or this Progressive Design Build Contract requested by the Owners Representative as may be required by Applicable Law or this Progressive Design Build Contract
E. Schedule of Values Utilization

1. Applications for Payment: The Schedule of Values, that is acceptable to the County, shall be the basis for the PDB Company’s applications for payment.

2. Changes to the Schedule of Values: The County shall have the right to require the PDB Company to alter the value or add/delete categories listed on the Schedule of Values at any time for the following reasons:
   a) The Schedule of Values appears to be incorrect or unbalanced.
   b) A revision to the segregation of values is required due to the PDB Company revising the sequence of construction or assembly of building components, which in turn invalidates the Schedule of Values.
   c) Change Orders are issued to the PDB Company and require incorporation into the Schedule of Values.

3. Stored Materials: The PDB Company is required to correlate the documentation for payment of stored materials requested in the Application for Payment against the agreed upon breakdown of the Schedule of Values. The County reserves the right to not process the application for payment if this correlation has not been submitted in conjunction with the application for payment.

6.11 RETAINAGE

No retainage will be held during Phase 1 of the contract. Once Phase 2 has been authorized, to the extent allowed by law, the County shall withhold a retainage amount of each monthly payment otherwise due and payable to the PDB Company in the amount of 10 percent. Such holdbacks shall continue until the PDB Company satisfactorily completes 50 percent of the value of the Progressive Design Build Work performed is satisfactory to the County, at which time further payments will not be subject to retainer holdbacks. The County may, however, withhold additional retainage after 50 percent of the work is complete pursuant to the Progressive Design Build Contract. The retained amount shall be released upon Acceptance except for amounts equal to 200 percent of the value of any outstanding Progressive Design Build Work.

6.12 FINAL PAYMENT/CLOSE-OUT OF PROJECT

Following acceptance and the project milestone “Complete” has be achieved the project must be closed-out for the PDB Company to receive the Final Payment. The PDB Company shall provide as part of the project submittals the following documents which are also provided in Appendix 7:

a. An affidavit that all payrolls, bills for materials and equipment, and other indebtedness connected with the work have been paid otherwise satisfied; each subcontractor must also provide an affidavit.
b. The surety’s consent to final payment
c. Certificate of Occupancy for all facilities constructed as part of the Progressive Design Build Work
d. Contractor Statement of Completion of all Work
e. Notification of Warranty Period for all major pieces of equipment
f. Transmittals signed by Owners Representative for all deliverables
g. A final invoice for the PDB Work
h. Other documents requested by the Owners Representative as deemed required for final payment.

APPENDIX 7: PROJECT DELIVERABLES

7.1 GENERAL REQUIREMENTS

The PDB Company shall be required to prepare several comprehensive Project Plans and Manuals, which satisfy the County’s objectives for Plant performance. Cost of completion of the work required for Appendix 7 shall be included in the Progressive Design Build GMP. The PDB Company shall develop each of the required plans in sufficient detail to cover activities during the construction, start-up and transition periods with the understanding that the contract operator will further develop each of the plans as necessary after the PDB Company’s responsibilities end.

Additionally, other Project Deliverables are required. These deliverables are also defined in this appendix.

The PDB Company shall develop the following plans:

Construction Control Plans—these plans are due to the Owners Representative 10 days prior to a scheduled Phase I Notice to Proceed - Construction date and must be approved by the Owners Representative.

- Quality Controls/Quality Assurance

Operational Plans/Manuals—these plans/manuals are due in accordance with this Appendix and the PDB Contract

- Equipment and Start-Up Testing Plan
- Acceptance Testing Plan
- Training Plan
- Operations and Maintenance Manuals

7.1.1 Format for all Plans/Manuals

All plans and manuals required by this appendix shall be submitted on 8½ by 11 white paper in three ring binders. Two (2) copies of draft plans and manuals shall be provided, 2 copies of final plans and manuals shall be provided. All documents (draft or final) shall also be provided in electronic form in PDF format. The Owners Representative must approve any exception to the format requirement.

7.2 PLANS/MANUALS

The PDB Company shall submit the following specific Plans of Actions to the Owners Representative.
7.2.1 Quality Assurance /Quality Control Plan

The Quality Assurance/Quality Control Plan is required to be submitted and approved prior to Notice to Proceed.

The PDB Company is responsible for providing a Quality Assurance/Quality Control Plan (QA/QC Plan) as a part of meeting the contract requirements. The QA/QC Plan shall establish a protocol to be used to maintain an effective construction quality control system. The QA/QC Plan shall identify the personnel, their qualifications; inspection procedures, sampling and test procedures, frequency and number of tests, laboratory and field test standards, and materials requiring testing that will be used to ensure a final product that complies with the approved design and specifications. The QA/QC Plan shall address all construction and manufacturing operations, both on-Site and off-Site, and shall be keyed to the proposed construction sequence. The QA/QC Plan shall be submitted for review and the PDB Company shall modify the QA/QC Plan as necessary to address the comments and requests of the Owners Representative. The Owners Representative will provide comments on the QA/QC Plan to the PDB Company within 30 days. At the discretion of the Owners Representative, subsequent updates to the QA/QC Plan may be required to meet the needs of the Project. The Owners Representative shall be notified of the testing schedule in advance of all testing and reserves the right to attend and request shop testing and/or other tests related to the construction elements.

The PDB Company shall further be responsible for certifying that all design submittals are in compliance with the RFQP and the Progressive Design Build Contract, and that the completed Progressive Design Build Project has been constructed in accordance with the approved design submittals.

7.2.2 Equipment and Start-Up Testing Plan

The Equipment and Start-Up Testing Plan shall be submitted to the Owners Representative for review and concurrence in accordance with Appendix 9 two weeks prior to the first equipment and Start-up testing event.

The Equipment and Start-up Testing Plan must address the personnel, resources and precautions required to accomplish the start-up and testing of the equipment. Additionally, it shall address all issues in accordance with Appendix 9.

7.2.3 Transition Plan

The PDB Company shall describe how transition from construction, startup, testing and acceptance phases will convert to full time operation of the accepted equipment or system. This plan shall also discuss decommissioning procedures.

7.2.4 Acceptance Test Plans

The PDB Company shall develop and submit an Acceptance Test Plan for the PDB Work. The Acceptance Test Plan must satisfy the requirements of Appendices 1, 3, 8, and 10. The Acceptance Test Plan shall be approved by the Owners Representative prior to the conduct of the Acceptance Test.
7.2.5 Training Plan/Training Program

The PDB Company shall submit an Operator Training Plan (Training Plan). The Training Plan shall clearly define the classroom and hands-on training curriculum for the County’s Contract Operators. A training schedule shall be submitted in the Training Plan.

The PDB Company shall provide a training program for the Contract Operators. Such training shall include, but not be limited to, equipment operations, repair, and maintenance, sampling and analytical procedures, regulatory requirements, supervisory skills, and safety and occupational health procedures.

The PDB Company will provide initial facility specific training opportunities for the operations contractor employees during the transition phase. These training activities must be coordinated such that hands on training can be provided by the equipment manufacturers. These training opportunities must be offered on a minimum of two separate occasions to allow some flexibility for coordination with the start-up schedule and schedule of the contract operator personnel. The PDB Company shall provide documentation of all training completed during start-up and transition phases to the participants. Videotaping will be provided for all vendor training.

7.3 OTHER DELIVERABLES & NON-PERIODIC REPORTS

7.3.1 Record Drawings

After Substantial Completion the PDB Company shall deliver to the Owners Representative sets of Record Drawings in accordance with the requirements of Appendix 5 prior to, or with the final invoice. The final invoice will not be paid until the Record Drawings are reviewed and accepted by the County. The Record Drawings shall also be delivered to the Owners Representative in electronic format on a CD/ROM.

7.3.2 Equipment and Start-Up Test Report

Following individual equipment and process start-up and prior to acceptance testing the PDB Company shall submit a report to the Owners Representative as to the results of the equipment and process start-up.

7.3.3 Acceptance Testing Report

At least 90 days prior to the Scheduled Acceptance Date, the PDB Company shall submit to the County a detailed Acceptance Testing Plan. The results of Acceptance Testing shall be submitted to the Owners Representative in an Acceptance Testing Report prior to the Final Payment. The report will be reviewed by the Owners Representative and returned with comments within 30 days. The PDB Company shall make all changes associated with the Owners Representative’s comments and submit a Final Report.

7.3.4 Close-Out Deliverables

Per the PDB Contract the following documentation is required to process the final Pay application:

a. An affidavit that all payrolls, bills for materials and equipment, and other indebtedness connected with the work have been paid otherwise satisfied; each subcontractor must also
provide an affidavit.
b. The surety’s consent to final payment
c. Certificate of Occupancy for all facilities constructed as part of the Progressive Design Build Work
d. Contractor Statement of Completion of all Work
e. Notification of Warranty Period for all major pieces of equipment
f. Transmittals signed by Owners Representative for all deliverables
g. A final invoice for the PDB Work
h. Approved Records Drawings.
i. Equipment invoices.
APPENDIX 8: EQUIPMENT START-UP AND TESTING

8.1 GENERAL

The purpose of Equipment and Start-Up Testing is to confirm, prior to Acceptance Testing that the PDB Work equipment meets the Minimum Technical Requirements set forth in Appendices 1, 3, 8, and 10. Due to hydraulics or other constraints, all the Equipment and Start-Up Tests outlined in this Appendix may not be feasible prior to Acceptance Testing. If needed, design rated flow capacities can be simulated by operating individual units or parts of the Plant. Equipment and Start-Up Testing shall be performed by the PDB Company pursuant to the provisions described in this Appendix and the Progressive Design Build Contract. Testing is to be done so that plant operations will not be disrupted and to ensure the plan meets the NPDES Permit. The County reserves the right to require the PDB Company to perform an Equipment or Start-Up Test of any individual process or any combination of related processes during the Acceptance Test should loading conditions not be available.

The PDB Company shall prepare an Equipment and Start-up Testing Plan prior to testing any equipment. The plan shall be submitted a minimum of 90 days prior to the anticipated test starting date and must be approved by the Owners Representative. The plan shall outline all resources required including, but not limited to: key personnel, power, water, length of time required, lab tests, and chemicals required for a complete test. The plan shall discuss possible impacts the tests could have on plant operation and/or NPDES Permit compliance. All test results shall be recorded and included in the final Equipment and Start-Up Test Report described in section 8.6 of this Appendix.

All labor, materials, equipment, chemicals, fuels, sampling, laboratory testing, and other services required to perform the Equipment and Start-Up Test shall be supplied by the PDB Company at no additional cost to the County. During the test, the PDB Company will operate and maintain all systems under normal operating conditions, including, but not limited to, routine equipment operation, maintenance services, chemicals, and electric usage. Under no circumstances shall the equipment be operated under conditions that are more severe than the maximum allowable operating conditions for which the equipment was designed.

The equipment will be deemed to have passed the Equipment and Start-Up Test if the performance standards established in this Appendix and in Appendices 1 and 3 are satisfied. At a minimum, testing shall be performed on the systems listed in Section 8.6.

8.2 DEFINITIONS

These checkouts and tests are further described in Section 8.6.

8.2.1 Pre-Operational Checkout (Step 1)

Is defined as the documented physical checks (tests) that must occur to ensure that an item of equipment or equipment system is ready for functional testing. Example components of pre-operational checkouts include but are not limited to the following:

- Pressure and/or leakage tests, water-tightness of concrete structures, and pipe testing. Electrical
testing, resistance testing in accordance with NETA - Section 16.

- Phase/motor rotation checks.
- Instrument calibration and loop tests.
- Pre-operational checkout of instrumentation system controls.
- Pre-operational checkout of mechanical equipment to include alignment, lubrication, torque, limit switches, and other checks as recommended by the manufacturer.

8.2.2 Functional Testing (Step 2)

Is defined as the testing of the individual items of equipment within a system under simulated conditions to determine contract compliance. This is done utilizing plant effluent, potable water, or another acceptable (approved in advance) substitute test media. The equipment will be operated long enough to gather information (data) on noise, temperature, vibration, performance characteristics, and to make initial adjustments of any applicable controls. Initial baseline data will be gathered on equipment with motors greater than one horsepower including amperage, bearing temperatures, and vibration.

The instrumentation and control field testing (loop checks from the field devices to PLC or distributed control systems as well as field calibrations) will be accomplished during the pre-operational checkout and functional testing stages as defined above.

8.2.3 Start-up Testing (Step 3)

Is defined as the testing of all components within a system collectively to ensure that the system and all of its integral components function as intended. Water and/or other temporary media supplied by the PDB Company will be circulated through the completed facility/system prior to testing.

8.2.4 Acceptance Testing (Step 4)

Is defined as the start-up and operation of all the systems installed, under actual operating conditions, as part of the actual plant process. The acceptance test period is 30 days and is performed according to Appendix 10.

8.3 START-UP PROGRAM IMPLEMENTATION

8.3.1 Start-Up Meetings

The PDB Company shall schedule and conduct regular periodic start-up meetings (separate from regular progress meetings). The start-up meetings will be held at least every 10 days (once start-up planning commences) and may be scheduled at a more frequent interval by the Owners Representative if necessary. Start-up meetings shall be held at the site. At a minimum, the start-up meetings shall be attended by the Owners Representative, PDB Company, and Sub-Companies as appropriate to the agenda, suppliers, manufacturers, and tradesman.

The meeting agenda shall generally include review and approval of minutes of previous meeting, review of start-up progress since the previous meeting, field observations, problems, and conflicts, problems which impede start-up schedule, delivery schedules, corrective measures and procedures to regain the
start-up schedule, revisions to start-up schedule, progress and schedule of the preceding work period, coordination of schedules, review of start-up submittal schedules and status, status of start-up related requests for information, and any other business deemed appropriate.

8.3.2 Start-up and Testing Schedule

The PDB Company shall produce an overall testing schedule setting forth the sequence contemplated for performing the test work. The schedule shall be in bar chart form, plotted against calendar time, shall detail the equipment and systems to be tested, and shall be coordinated with the construction schedule. The testing schedule shall show the contemplated start date, duration of the test and completion of each test. The preliminary test schedule shall be submitted with the overall Equipment and Start-up Test Plan. The Owners Representative will not witness any testing work until the PDB Company has submitted a schedule to which the Owners Representative takes no exception. The test schedule shall be updated weekly, and presented at each start-up meeting, showing actual dates of test work, indicating systems and Equipment and Start-Up Testing completed satisfactorily and meeting the requirements of the Contract Standards, and also re-forecast the upcoming testing and reflect any schedule adjustments accompanied by written reason for the change. The PDB Company’s baseline start-up and testing schedule is to be submitted with the overall test plan.

8.3.3 Documentation

The PDB Company shall develop a record-keeping system to document all activities associated with Equipment and Start-up Testing and its prerequisites. Equipment and system documentation shall include date of test, equipment number or system name, nature of test, test objectives, test results, test instruments employed for the test and signature spaces for witness by the Owners Representative, the PDB Company's Start-Up Engineer, and the equipment manufacturer. At a minimum, the PDB Company shall utilize the attached forms to document such tests. A separate file shall be established for each system, organized by start-up phase (i.e., pre-operational, functional, start-up, and acceptance test phase) and will include sections for each item of equipment. These files shall include the following information and documentation as a minimum.

8.4 TEST PLAN ORGANIZATION

The Test Plan shall be organized as follows:

1. Index

2. Overall Schedule

3. Each type of equipment will have its own section within the system and include the following:

   - The detailed pre-operational test procedures.
   - The detailed functional test procedures.
   - Customized mechanical, electrical, and instrumentation pre-operational and functional test forms as applicable.
   - Other pre-operational test documentation as required for piping and mechanical equipment.
4. A separate section will be created each for the system start-up testing, and acceptance testing and include the following, as applicable:

- The detailed start-up test procedure.
- A detailed start-up system check/sign-off sheet (based on system tests, control checks, and interlock checks to be performed).
- System start-up test completion sign-off form.
- Detailed work plans
- Communications plan
- Contingencies, as well as other requirements outlined under tie-ins and modifications to existing systems
- The acceptance testing schedule shall reflect a 30-day test overview period and proposed spreadsheet forms to be utilized by the PDB Company's operations staff to record appropriate operational and performance data on a regular interval for the 30 days.

8.5 SPECIFIC START-UP TESTING REQUIREMENTS

The PDB Company shall provide, at no expense to the County, all power, fuel, compressed air, supplies, water, and chemicals; as well as all labor, temporary piping, heating, ventilating, and air conditioning for any areas where the proposed facilities are not complete but operable at the time of Equipment and Start-up Testing and its prerequisites. The PDB Company shall provide all other items and work required to complete Acceptance Testing and its prerequisites as outlined in Appendix 10. Temporary facilities shall be maintained until permanent systems are in service.

The PDB Company shall also provide all necessary qualified operations personnel and manufacturer’s field service personnel of the major equipment suppliers on an eight hour per day basis at the facilities and on a 24 hour per day basis locally during the Equipment and Start-Up Test period as necessary. As part of the equipment start-up and acceptance testing plan the PDB Company shall submit detailed work plans, communications plan, contingencies plan, and other requirements as the Owners Representative may request.

8.5.1 Start-up Staffing

The start-up efforts shall be staffed as described in the following sections unless otherwise approved by the Owners Representative in advance.

8.5.2 Start-up Engineer

The PDB Company shall appoint an operations engineer or equally qualified operations specialist to manage, coordinate, and supervise all aspects of the PDB Company's Start-Up and Testing Program including, but not limited to those components of the program as listed within this appendix. The designated representative shall have at least five (5) years of total experience, or experience on at least five separate projects, in managing the start-up commissioning of mechanical, electrical, instrumentation, and piping systems.
8.5.3 PDB Company’s Testing Team

The PDB Company’s Testing Team shall include, at a minimum, staffing utilizing a like number of personnel anticipated to operate the facility complete with certifications and licenses as required by law, a qualified Mechanical/Equipment Foreman, a qualified Electrical Journeyman, and a qualified Instrument Technician.

The PDB Company is responsible to have the appropriate personnel, procedures, and test forms at the test site when performing a scheduled checkout/testing activity that is to be witnessed by the Owners Representative. At a minimum, the forms in Attachment 8A shall be utilized for this purpose and include with the final written Test Report described in this Appendix.

8.5.4 Testing Equipment

All test equipment (gauges, meters, thermometers, analysis instruments, and other equipment) used for calibrating or verifying the performance of equipment installed under this contract shall be calibrated to within plus or minus two (2) percent of actual value at full scale. Pressure gauges shall be calibrated in accordance with ANSI/ASME B40.1. Thermometers shall be calibrated in accordance with ASTM E77 and shall be furnished with a certified calibration curve.

Test instruments shall be calibrated to references traceable to the National Institute of Standards and Technology and shall have a current sticker showing date of calibration, deviation from standard, name of calibration laboratory and technician, and date recalibration is required.

Calibration equipment/test instruments utilized for Start-Up and Equipment Testing shall be documented to include identification (by make, manufacturer, model, and serial number) of the test equipment, date of original calibration, subsequent calibrations, calibration method, and test laboratory as well as documentation of current calibration.

All analysis instruments, sensors, gauges, and meters used for performance testing shall be subject to recalibration to confirm accuracy after the testing has been completed. All analysis instruments, sensors, gauges, and meters installed under this contract shall be subject to recalibration prior to acceptance.

Test equipment used to simulate inputs and read outputs shall have a rated accuracy at the point of measurement at least three times greater than the component under test. Buffer solutions and reference fluids shall be provided as necessary for tests of analytical equipment.

8.6 TEST PLAN IMPLEMENTATION

This program will be implemented in four distinct steps (phases). These steps are the Pre-Operational Checkout, the Functional Testing, Start-up Testing, and the Acceptance Testing (Appendix 15).

8.6.1 Step 1 - Pre-Operational Checkout and Testing

Pre-operational checkout includes multi-discipline work completion and physical checkout. The Pre-operational Completion Verification and Pre-operational test reports include the following required
testing. Examples of these documented tests include, but are not limited to:

- Field pressure/leakage test reports for all pipe, valves, and appurtenances.
- Wire insulation megohm reports for all 600V wire.
- Phasing, ratio, polarity, ground resistance, current injection, insulation resistance, over potential test, and circuit breaker contact resistance reports
- for medium voltage switchgear.
- Insulation power factor and resistance test reports for surge arresters.
- Megger reports for Unit Substations, Three Winding Transformers, and 4160V motor control centers.
- Megger reports and ground connection tests.
- Loop Status Report and Component Calibration forms.
- Equipment installation checkout forms.

### 8.6.1.1 Equipment Pre-Operational Checkout

Equipment pre-operational checks and tests shall include, but are not limited to, the following:

- Check for proper installation, alignment, support, and anchorage per the applicable manufacturers’ operation and maintenance manual and in accordance with the contract documents.
- Check the equipment for proper adjustment, packing of seals, lubrication, drive connection, motor connection, and belt/chain tension per the applicable manufacturers’ operation and maintenance manual and in accordance with the contract documents.
- Check the associated process, seal water, drain, and vent pipe connections for proper routing and connection. Check to insure the pipe testing was performed and signed as completed for all the associated piping.
- Ensure that the equipment is clean and free of any construction debris that could potentially cause a malfunction.
- Ensure that all safety guards, signage, and other safety measures such as hearing protection, etc., are in place.

Manufacturer’s representatives shall perform all pre-operational tests per the manufacturer’s recommendations and review the equipment installation and sign the manufacturer’s installation portion of the certification form. If the manufacturer’s representative brings his own checklist, obtain a copy of the completed form and attach it to the PDB Company’s completed forms. Note that the manufacturer must also fill out the contract approved checkout form (manufacturer’s own form will not serve as a substitute).

All gates and valves associated with the equipment system must be checked for proper installation, adjustment, and lubrication per the manufacturer’s recommendations.

### 8.6.1.2 Electrical Pre-Operational Checks/Tests

Prior to energizing electrical circuits, use a 1,000-volt megohmmeter to measure insulation resistance on conductors and insulated parts of electrical equipment. All measurements shall meet or exceed the appropriate ICEA, NEMA, or ANSI standard. Any insulation resistance less than 10 megohms is
unacceptable. Record results, as well as ambient temperature. See attached form for example.

Measure phase-to-ground insulation resistance for all circuits 120 volts and above, with the exception of lighting circuits. Measurements may be made with motors and other equipment connected, except that solid-state equipment shall be disconnected unless the equipment is normally tested by the manufacturer at voltages in excess of 1,000 volts DC.

Complete Test Form for each installed motor. Measure the insulation resistance of all motors before connection. Measure the insulation resistance for all motors at the time of delivery as well as when connected. Insulation resistance values less than 10 megohms are not acceptable.

Adjust and make operative all protective devices. Perform a functional check of the control circuit prior to energization of the equipment.

Review all associated electrical terminations, switches, and breakers for satisfactory installation.

8.6.1.3 Individual Component/Instrument Calibration Pre-Operational Check/Test

Each instrument and final element shall be field calibrated in accordance with the manufacturer's recommended procedure. Instruments shall then be tested in compliance with ISA S51.1 and the data entered on the applicable test report form. Alarm trips, control trips, and switches shall be set to initial values specified in the design at this time. Final elements shall be checked for range, dead band, and speed of response.

Calibration of analysis instruments, sensors, gauges, and meters installed under this contract shall proceed on a system-by-system basis. No equipment or system start-up, or acceptance tests shall be performed until instruments, gauges, and meters to be installed in that particular system have been calibrated and the calibration work has been witnessed by the Owners Representative.

Testing of instrument process piping/tubing, wiring and individual components shall be completed and documented on the approved test forms provided to the Owners Representative as part of the pre-operational testing phase and prior to commencement of individual loop testing conducted during the pre-operational functional test phase.

Any component which fails to meet the required tolerances shall be repaired by the manufacturer or replaced, and the above tests repeated until the component is within tolerance. System instrumentation equipment supplied and installed must also be reviewed for proper installation and termination as part of the pre-operational checkout.

8.6.1.4 Pre-Operational Checkout Summary

The pre-operational checkout and testing for each item shall be carried out in accordance with the PDB Company’s submitted and approved procedures and documented on the PDB Company’s approved pre-operational test forms.

The PDB Company shall complete the pre-operational testing requirements listed above, at a minimum,
for each item of mechanical, electrical, instrumentation equipment prior to beginning any functional
testing with regard to the equipment or the systems in which the equipment functions

8.6.2 Step 2 - Functional Test

The second step in the program is the functional testing of the equipment. These tests begin for each item
of equipment only after the Pre-operational Checks have been satisfactorily completed for all components
for the particular equipment.

The functional testing for each item of equipment shall be carried out in accordance with the PDB
Company's submitted and approved procedures and documented on the approved functional test forms.

Once, 1) all affected equipment has been subjected to the required pre-operational testing procedures; and
2) the Owners Representative has witnessed and has not found deficiencies in that portion of the work,
individual items of equipment and systems may be started and operated under simulated operating
conditions to determine as nearly as possible whether the equipment and systems meet the Requirements
in Appendices 1, 3, and 8. If available, plant process media may be employed for the testing of all liquid
systems except gaseous, oil, or chemical systems. If not available, potable water shall be employed as the
test medium. Test media for these systems shall either be the intended fluid or a compatible substitute.
The equipment shall be operated for a sufficient period of time to determine machine-operating
characteristics, including noise, temperatures and vibration; to observe performance characteristics; and
to permit initial adjustment of operating controls. When testing requires the availability of auxiliary
systems such as looped piping, electrical power, compressed air, control air, or instrumentation which
have not yet been placed in service, the PDB Company shall provide, and the Owners Representative shall
approve in advance, acceptable substitute sources, capable of meeting the requirements of the machine,
device, or system at no additional cost to the County. Disposal methods for test media shall be subject to
review by the Owners Representative. During the functional test period, the PDB Company shall obtain
baseline operating data on all equipment with motors greater than 1 horsepower to include amperage,
bearing temperatures, and vibration.

Test results shall be within the tolerances set forth in this Appendix and Appendices 1, 3, and 8 of the
Contract Documents and as indicated in the PDB Company's functional test plan and the manufacturer's
criteria. If no tolerances have been specified, test results shall conform to tolerances established by
recognized industry practice. Where, in the case of an otherwise satisfactory functional test, any doubt,
dispute, or difference should arise between the Owners Representative and the PDB Company regarding
the test results or the methods or equipment used in the performance of such test, then the Owner’s
Representative may order the test to be repeated at the PDB Company's expense. Where the results of any
functional test fail to comply with the Minimum Technical Requirements found in Appendices 1, 3, and
8 for such test, then such repeat tests as may be necessary to achieve the Contract Standards shall be made
by the PDB Company at its expense.

The Functional Test reports (test documentation) include results from the required testing. Examples of
these types of reports include, but are not limited to:

- The leakage and cycling/functional field test of valves leakage.
- The cycling/function checks of the sluice gates, slide gates, weir gates, stop logs, and stop plates.
• The leakage testing of sluice gates, slide gates, weir gates, stop logs, and stop plates in accordance with AWWA and applicable specifications.
• Vibration, noise, and capacity testing of Pumps.
• Air distribution and leakage test of any diffused air systems.
• Loop functional test for Instrumentation and Control

8.6.2.1 Process/Mechanical/Equipment – (Functional Testing)

During the functional verification check and testing process, the PDB Company and the various Manufacturers’ Technical representatives shall examine and record the initial start-up performance of the components provided by their respective firms in accordance with the PDB Company's approved functional test procedure.

The initial operation, testing and adjustment shall be as required to prove that the equipment has been installed properly and operates under the conditions specified.

Upon completion of this work, the manufacturer's field service technician shall complete the PDB Company’s approved functional test form as well as their own signed report to record the results of his/her inspection, operation, adjustments and tests. The report shall include detailed descriptions of the points inspected, tests and adjustments made, quantitative results if such are specified, and suggestions for precautions to be taken to ensure proper maintenance.

8.6.2.2 Electrical - (Functional Testing)

The PDB Company's electrician shall be present during all testing to confirm the electrical, provide troubleshooting assistance, repair as needed, and assist in gathering baseline data such as motor amperages.

Energize each control circuit and operate each control, alarm or malfunction device and each interlock in turn to verify that the specified action occurs. The PDB Company shall submit a description of his proposed functional electrical test procedures as part of the testing plan.

Verify that motors are connected to rotate in the correct direction. Verification may be accomplished by momentarily energizing the motor, provided the PDB Company confirms that neither the motor nor the driven equipment will be damaged by reverse operation.

8.6.2.3 Instrumentation and Control – (Functional Testing)

The PDB Company's instrumentation representative shall be on site full time during the functional test phase to perform loop checks and to support the start-up team as needed. Any packaged equipment or manufacturer supplied control panels must be field tested to verify all control interlocks and control functions during this phase of testing by the equipment supplier. The PDB Company’s functional test procedure for each piece of equipment shall define each interlock to be tested.

Each instrument loop shall be tested. This testing shall check operation from transmitter to readout components. Signals shall be generated utilizing the primary measuring elements where possible. Signals
shall be injected only if primary element is unavailable.

If any output device fails to indicate properly, corrections to the loop shall be made as necessary and the test repeated until all instruments operate properly.

### 8.6.2.4 Functional Testing Summary

The functional testing for each item of equipment, electrical, and instrumentation shall be carried out in accordance with the PDB Company's submitted and approved procedures and documented on the PDB Company's approved functional test plans and forms. This information shall be accumulated for all equipment and will serve as the basis for the Equipment and Start-Up Test Reports.

### 8.6.3 Step 3 - Start-Up Testing

Start-Up Testing begins after all Pre-operational checks and Functional tests have been satisfactorily completed. The PDB Company shall plan its activities to allow for Owners Representative witnessing of all tests and shall provide twenty-four (24) hours’ advance notice of all testing activities.

The PDB Company shall develop the Minimum Testing Requirements given below to justify their design and equipment selection.

The PDB Company's start up test plan shall be a detailed procedure to confirm all System Automatic Mode functions, verify all system interlocks, and reconfirm all equipment functions and controls. All design and performance criteria will be demonstrated and documented during this period. The PDB Company, manufacturer, electrical, and instrumentation representatives will be on site during testing activities, but no less than an 8 hour a day basis and locally on 24 hours a day basis during this period.

In the event of failure to demonstrate satisfactory performance of the system on the first or any subsequent attempt, all necessary alterations, adjustments, repairs and replacements shall be made. When the system is again ready for operation, it shall be brought on line and a new test shall be started. This procedure shall be repeated as often as necessary until the system has operated continuously to the satisfaction of the Owners Representative, for the specified duration at no additional cost to the County.

Any testing that is not capable of being done during the start-up testing phase may be done during the acceptance testing phase only if waiting to test equipment or systems during the acceptance testing phase will not have an impact on plant operations or prevent BCWRF from meeting NPDES permit compliance.

#### 8.6.3.1 Minimum Testing Requirements (To be determined for all equipment & included in specifications prior to purchase)

### 8.7 PREREQUISITES

Acceptance Testing and the Acceptance Test Plan shall comprehensively cover all potential modes of operation, including failure scenarios, as well as the operation of ancillary systems, to demonstrate full functionality of the facilities. Any failures of process, equipment or systems shall result in re-starting the acceptance-testing period. Specific acceptance testing criteria is described in Appendix 10.
8.8  EQUIPMENT AND START-UP TEST REPORT

A comprehensive Equipment and Start-Up Test Report shall be prepared and ten (10) copies submitted by
the PDB Company to the Owners Representative within 30 days after the completion of the Equipment
and Start-Up Test. The Equipment and Start-Up Test Report shall include, but not be limited to, the
following:

- A certification that testing was conducted in accordance with the Equipment and Start-Up Test
  Plan.
- A certification stating that the results of the Equipment and Start-Up Test, including a
determination of the extent to which the equipment complies with the applicable unit, process
design criteria, Minimum Technical Requirements in Appendix 5, Performance Standards and
Performance Criteria, and the requirements of this Appendix and the Progressive Design Build
Contract.
- All required data measured and recorded during the test(s) including all laboratory analyses.
- Record of equipment outages, failures, repairs and preventative maintenance;
- Data and calculations demonstrating the ability of the equipment to meet the requirements of this
Appendix;
- Summary of test results and conclusive evidence of compliance with all test requirements; and
- Any other data reasonably requested by the Owners Representative to be included in such reports.

The Equipment and Start-Up Test Report shall include copies of the original forms, data sheets, log sheets,
and all calculations used to evaluate performance during testing, and copies of any laboratory reports
conducted in conjunction with Equipment and Start-Up Testing.

Until results of Equipment and Start-Up Testing are acceptable to the Owners Representative, the PDB
Company shall make all necessary changes, readjustments and replacements. Defects, which cannot be
corrected by installation adjustments, will be sufficient grounds for rejection of any equipment.
APPENDIX 9: EQUIPMENT START-UP AND TESTING FORMS

9.1 Equipment Start-up and Acceptance-Test Completion Forms

The forms in this Appendix are samples showing the format and minimum level of detail required for documentation. The PDB Company is advised that these are samples only and are not specific to this project or to any item of equipment or system to be installed under this contract. The PDB Company shall develop test documentation forms specific to each item of equipment and system installed under this contract. The PDB Company may use forms included in the Minimum Technical Requirements as a basis for test documentation forms to be developed for this project.

Acceptable example documentation forms for all systems and items of equipment shall be produced and submitted for review and approval by the Owners Representative. Once the Owners Representative has reviewed and taken no exception to the forms proposed by the PDB Company, the PDB Company shall produce customized forms for each item of equipment and system and include these individual forms in the overall test plan that will be submitted for approval as required in Appendices 8 and 10.
SAMPLE FORM

WIRE AND CABLE RESISTANCE TEST DATA FORM:
Form 9A

Project ____________________________ Date: __________________

Site Conditions: ____________________________ Time: __________________

Circuits or Items being tested:
________________________________________
________________________________________
________________________________________

Wire or Cable No.: ____________ Temperature, °F ____________

Insulation Resistance, Location of Test From To megohms

1. ______________
2. ______________
3. ______________
4. ______________
5. ______________
6. ______________
7. ______________

Comments:
________________________________________
________________________________________

CERTIFIED

________________________________________
Company’s Representative Date

WITNESSED

________________________________________
County’s Representative Date
INSTALLED MOTOR TEST FORM (PRE-OPERATIONAL CHECK/TEST):
Form 9B

Date of test__________________  Motor Equipment Number____________________

Equipment Driven______________  Ambient temp _____ °F  MCC Location________

Resistance:
Insulation resistance phase-to-ground megohms: Phase A_______, Phase B_______, Phase C_______

Current at Full Load:
Phase_______  Current, amps ______
Phase_______  Current, amps ______
Phase_______  Current, amps ______

Thermal Overload Device: Manufacturer/catalog #______________  Amperes __________

Circuit breaker (MCP) setting: ____________

Motor Nameplate Markings:
Mfr__________  Mfr Type__________  Frame__________  HP________________
Volts__________  Phase__________  RPM__________  **Service factor__________
Amps__________  Freq__________  Ambient temp rating____°C

Time rating__________  **Design letter______________
(NEMA 1-10.35)  (NEMA MG-1.16)

Code letter__________  Insulation class __________

**Required for 3-phase squirrel cage induction motors only.

CERTIFIED

______________________________  __________________________
Company’s Representative  Date

______________________________  __________________________
County’s Representative  Date
## SAMPLE FORM

### LOOP WIRING AND INSULATION RESISTANCE TEST DATA FORM
**(PRE-OPERATIONAL CHECK/TEST):**

*Form 9C*

Loop No.: ________________

List all wiring associated with a loop in table below. Make applicable measurements as indicated after disconnecting wiring.

<table>
<thead>
<tr>
<th>Wire No.</th>
<th>Panel Tie</th>
<th>Field TB</th>
<th>Cond./ Cond.</th>
<th>Cond./ Shield (A/SH)</th>
<th>Shield/ Gnd.</th>
<th>Cond./ Gnd.</th>
<th>Cond./ Shield</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td></td>
<td></td>
<td>--</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
<td></td>
<td>(A/B)</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
<td>(A/C)</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td></td>
<td></td>
<td>(A/D)</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

etc.

**a. Continuity Test.** Connect ohmmeter leads between wires A and B and jumper opposite ends together. Record resistance in table. Repeat procedure between A and C, A and D, etc. Any deviation of ±2 ohms between any reading and the average of a particular run indicates a poor conductor, and corrective action shall be taken before continuing with the loop test.

**b. Insulation Test.** Connect one end of a 500 volt megger to the panel ground bus and the other sequentially to each completely disconnected wire and shield. Test the insulation resistance and record each reading.

CERTIFIED  

Company’s Representative  

Date  

WITNESSED  

County’s Representative  

Date
## INSTRUMENT CALIBRATION SHEET

### Information

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>MANUFACTURER</th>
<th>PROJECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tag No:</td>
<td>Name:</td>
<td>Number:</td>
</tr>
<tr>
<td>Description:</td>
<td>Model:</td>
<td>Name:</td>
</tr>
<tr>
<td></td>
<td>Serial #:</td>
<td></td>
</tr>
</tbody>
</table>

### Settings

**ANALOG DEVICE**

- Units: 
- Inst. Range: 
- Calibration Range: 
- Suppression/Elevation: 

**DISCRETE DEVICE**

- Units: 
- Inst. Range: 
- Setpoint (note rising or falling) 
- Trip 

### Calibration

<table>
<thead>
<tr>
<th>Input / Output</th>
<th>Input Value</th>
<th>Desired Output</th>
<th>Actual Output</th>
<th>Setpoint</th>
<th>CONTACTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td></td>
<td></td>
<td></td>
<td>Trip</td>
<td>Open</td>
</tr>
<tr>
<td>25%</td>
<td></td>
<td></td>
<td></td>
<td>Reset</td>
<td>Close</td>
</tr>
<tr>
<td>50%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>75%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Calibration in Shop: ☐  Calibration in Field: ☐

### Acceptance & Notes

<table>
<thead>
<tr>
<th>#</th>
<th>NOTES:</th>
<th>Component Calibrated and Ready for Start-Up</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Contractor: Date:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inspector: Date:</td>
</tr>
</tbody>
</table>
# Loop Pre-Operational Status Report

**PROJECT NAME:**

**PROJECT NO.:**

**FUNCTIONAL DESCRIPTION / REQUIREMENTS:**

<table>
<thead>
<tr>
<th>Number</th>
<th>Area Pre No</th>
<th>Description</th>
<th>Inst.Inst'l. Verified</th>
<th>Mech/Pipe Installed</th>
<th>Wiring Installed</th>
<th>Loop Continuity</th>
<th>Device Functionality</th>
<th>Initial Calibration</th>
<th>Range/Set Point</th>
<th>DCS Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>FI 818</td>
<td>Scrubber Train 1 air flow indicator</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**REMARKS:**

Loop(s) Ready for Operation

By: ___________________________

Date: ___________________________

Company's Representative: ___________________________

Date: ___________________________

County's Representative: ___________________________

Date: ___________________________
**SAMPLE FORM**

**Form 9F**

**INSTRUMENTATION/FUNCTIONAL TEST / SIGN-OFF SHEET**

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>MANUFACTURER</th>
<th>PROJECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tag No:</td>
<td>Name:</td>
<td>Number:</td>
</tr>
<tr>
<td>Description:</td>
<td>Model:</td>
<td>Name:</td>
</tr>
<tr>
<td>Serial #:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**FUNCTIONS**

<table>
<thead>
<tr>
<th>RANGE</th>
<th>VALUE</th>
<th>ENG. UNITS</th>
<th>COMPUTING FUNCTIONS</th>
<th>CONTROL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Action? Direct Reverse</td>
<td></td>
</tr>
<tr>
<td>Indicate</td>
<td>Describe:</td>
<td></td>
<td>Modes? P / I / D</td>
<td></td>
</tr>
<tr>
<td>Record</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alarm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**ANALOG CALIBRATIONS (5-point check)**

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
<th>Input Value</th>
<th>Output</th>
<th>Field Instrument</th>
<th>Trip Point</th>
<th>Reset Point</th>
<th>Trip Point</th>
<th>Reset Point</th>
<th>Display #1</th>
<th>Display #2</th>
<th>CONTROL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local</td>
<td>PLC Display</td>
<td>DCS Display</td>
<td>(note rising or falling)</td>
<td>(note rising or falling)</td>
<td>GRAPHIC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**DISCRETE INPUT CALIBRATIONS**

<table>
<thead>
<tr>
<th>SOURCE</th>
<th>Action</th>
<th>Initiate</th>
<th>Release</th>
<th>Monitored</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volt./ Dry</td>
<td>DCS</td>
<td>PLC</td>
<td>Initiate</td>
<td>Release</td>
</tr>
<tr>
<td>Device</td>
<td></td>
<td></td>
<td>Start</td>
<td>Stop</td>
</tr>
</tbody>
</table>

**DISCRETE OUTPUT CALIBRATIONS**

<table>
<thead>
<tr>
<th>CONTROL MODE SETTINGS</th>
<th>P:</th>
<th>I:</th>
<th>D:</th>
</tr>
</thead>
</table>

**NOTES:**

Component Calibrated and Ready for Start-Up

Company's Representative: Date:

County's Representative: Date:
## EQUIPMENT TEST REPORT
**Form 9G**

Equipment Name:  
Equipment Number:  
Specification Ref:  
Location:

<table>
<thead>
<tr>
<th></th>
<th>Company’s Representative Verified</th>
<th>Date</th>
<th>County’s Representative Verified</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PREOPERATIONAL CHECKOUT/TEST (STEP 1)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mechanical</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lubrication</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alignment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anchor bolts</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seal water system operational</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equipment rotates freely</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety guards</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valves operational</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>O&amp;M manual information complete</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manufacturer's installation certificate complete</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Electrical</strong> (Circuit ring-out and high-pot tests)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Circuits:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power to MCC 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control to HOA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indicators at MCC:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red (running)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Green (power)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amber (auto)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indicators at local control panel</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wiring labels complete</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nameplates:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MCC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control station</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control panel</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equipment bumped for rotation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Piping Systems</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cleaned and flushed:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suction</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discharge</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressure tests</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Instrumentation and Controls</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flowmeter FE2502F calibration</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calibration Report No.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Flow recorder FR2502G calibrated against transmitter
VFD speed indicator calibrated against independent reference
Discharge overpressure shutdown switch calibration
Simulate discharge overpressure Shutdown

**FUNCTIONAL TESTS (STEP 2)**

<table>
<thead>
<tr>
<th>Mechanical</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor operation temperature satisfactory</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pump operating temperature satisfactory</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unusual noise, etc.?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pump operation: 75 gpm/50 psig</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measurement:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flow</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alignment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dowelled in</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Remarks:**

**Electrical**

<table>
<thead>
<tr>
<th>Local switch function:</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Runs in <strong>HAND</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No control power in <strong>OFF</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Timer control in <strong>AUTO</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overpressure protection switch PS2502C functional in both <strong>HAND</strong> and <strong>AUTO</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overpressure protection switch PS2502C set at 75 psig</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PLC 2500 set at 24 hr cycle, 25 min <strong>ON</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
PIPING TEST DATA FORM:
Form 9H

Project: _______________________________ Date: ________________

Building or Structure: __________________________________________

Inspection (description of pipe): __________________________________

Description of Work to be Performed: ________________________________

______________________________________________________________

Specification Section.: ________________

Comments: ______________________________________________________

______________________________________________________________

Status of Test: (Circle One)

Passed  Passed with correction noted below:

______________________________________________________________

______________________________________________________________

Not Acceptable

______________________________________________________________

______________________________________________________________

CERTIFIED

Company's Representative ___________________________ Date

WITNESSED

County's Engineer ___________________________ Date
PROJECT NAME: _____________________________  Equipment Name: _____________________________

Project No.: _____________________________  Shop Dwg. Approved Date: __________________

Manufacturer: _____________________________  O&M Approved Date: __________________

Local Vendor: _____________________________  O&M Del. to Owner Date: __________________

Vendor Phone: _____________________________  Start 30-Day Test: __________________

Training Instructor’s Name: ___________  Complete 30-Day Test: __________________

Manufacturer’s Approval of Calibration and Installation
We hereby certify that the above named equipment has been installed, calibrated, and adjusted per the manufacturer’s instructions and is ready for full time operation. Witnessed by:

County Rep.: _____________________________  Company’s Engineer.: _____________________________
Mfg. Rep.: _____________________________  Date __________________

Manufacturer’s Functional Test
We hereby certify that the required functional test has been satisfactorily completed in accordance with contract specifications and the equipment is fully operational and capable of meeting design requirements as confirmed during Acceptance Testing. Witnessed by:

County Rep.: _____________________________  Company’s Engineer.: _____________________________
Mfg. Rep.: _____________________________  Date __________________

Manufacturer’s Instruction and Training
We hereby certify that the contract specified training services have been provided by a competent factory representative for the equipment listed above. The Owner’s personnel have been properly instructed in the operation, maintenance, and repair of the equipment as outlined in the specifications. Witnessed by:

County Rep.: _____________________________  Company’s Engineer.: _____________________________
Mfg. Rep.: _____________________________  Date __________________
SAMPLE FORM

Start-Up Test Report (Step 3)
Form 9J

System Name: Testing Plan
Approved:________________________

Start: Date__________ Time__________

Test Duration:__________ hours/days
(circle)

Location:

Planned Completion: Date________________ Time________________

Date  Time  Description (Operating condition/changes/problems/suspension)

________________________________________

________________________________________

________________________________________

________________________________________

________________________________________

________________________________________

________________________________________

Test Completed: Time______________ Date______________

COMMENTS: (Examples: pump cycles as specified, indicators functional, controls functional, pump maintains capacity, overpressure protection remains functional, hour meter functional, etc.)

________________________________________

________________________________________

________________________________________

________________________________________

________________________________________

________________________________________

________________________________________

RECOMMENDED FOR ACCEPTANCE TESTING:

Company’s Engineer  Owner’s Representative

________________________________________

County’s Representative
SAMPLE FORM
Acceptance Test Report (Step 4)
Form 9K
<Contract Title>

System Name: 

Testing Plan
Approved: 

Start: Date__________ Time__________

Test Duration:__________ hours/days
(circle)

Location:

Planned Completion: Date______________ Time______________

Date   Time   Description (Operating condition/changes/problems/suspension)

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Test Completed: Time______________ Date______________

COMMENTS:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

RECOMMENDED FOR SUBSTANTIAL COMPLETION:

__________________________________________
Company’s Engineer

__________________________________________
County’s Representative
APPENDIX 10: ACCEPTANCE TESTING REQUIREMENTS

10.1 GENERAL

After the PDB Company Work is in place, Equipment and Start-Up Testing have been performed, and prior to Acceptance of the work done for the PDB Project, the PDB Company with the assistance of the County’s operational staff shall perform Acceptance Testing. The purpose of Acceptance Testing is to verify that the plant has been designed and constructed such that while operating under Design Conditions, it will meet all Performance Criteria, and requirements of the PDB Contract. Acceptance test period of 180 days will substantiate the PDB Company’s Operational (electrical, chemical, and sludge) Guarantees. The County’s operational staff shall operate the facility during the acceptance testing period.

This Appendix outlines the Acceptance Testing for equipment and the whole plant that the County considers relevant to verify the PDB Company’s design and to substantiate the whole operation. The PDB Company shall submit to the Owner’s Representative an Acceptance Testing Report, which describes in detail that testing conducted and the results of the testing.

The acceptance test requirement will be required for any portion of the PDB Company work placed into operation prior to acceptance testing.

10.2 ACCEPTANCE TESTING PLAN

At least 90 days prior to the Scheduled Acceptance Date, the PDB COMPANY shall submit to the Owner’s Representative a detailed Acceptance Testing Plan. The Acceptance Testing Plan shall include specific, detailed protocols describing the procedures to be used, measurements to be made, permanent and temporary instrumentation to be used, organization of the test team, testing schedule, and the operation and maintenance schedule that will be used when conducting Acceptance Testing. The Acceptance Testing Plan shall indicate staffing and operation requirements, beyond those already in place, during Acceptance Testing.

The Owner’s Representative shall comment on or approve the Acceptance Testing Plan within 30 days of receipt. The Acceptance Testing Plan is not complete and approved until all of the Owner’s Representative’s comments are resolved. The Owner’s Representative’s approval will not be unreasonably withheld if the PDB COMPANY makes every effort to provide expeditious response to all comments. Acceptance Testing shall not begin until the Acceptance Testing Plan is approved, and the PDB COMPANY has been authorized by the Owner’s Representative to proceed with Acceptance Testing. Preliminary testing may be conducted at the PDB COMPANY Company’s expense; however, the results of such testing shall not be made part of the Acceptance Testing Report.

10.3 ACCEPTANCE TESTING

Prior to beginning Acceptance Testing, the following conditions shall be met:

1. Construction of the Design/Build Work shall have achieved Substantial Completion.
2. The Equipment and Start-Up Testing Reports shall have been completed, submitted, and accepted by the Owners Representative.
3. The Acceptance Testing Plan shall have been approved by the Owners Representative.

All, materials, equipment, etc. required to perform Acceptance Testing shall be supplied by the PDB COMPANY. All chemicals, fuels, sampling, laboratory testing shall be supplied by the County. The plant shall operate normally during the acceptance testing period, including chemical power usage. Laboratory analyses shall be performed by the County, using standard laboratory analytical quality control procedures. Except as indicated below, during Acceptance Testing, the PDB COMPANY shall provide assistance for operations, and maintenance services.

Should the performance of the plant be deemed to be unsatisfactory at any time during the Acceptance Test, immediate action shall be taken by the PDB COMPANY to ensure that the effluent does not exceed existing or interim limits, or pose a threat to human health and the environment. If remedial action is considered unlikely to satisfy this requirement, the equipment or applicable portion of the plant that fails to satisfy Acceptance Testing requirements will be shut down and the test terminated until such time as the above requirement is satisfied. The following subsections present requirements for the various parts of Acceptance Testing, divided by treatment process.

10.3.1 Whole Plant Acceptance Test

The PDB COMPANY shall demonstrate that the plant, when operating under normal conditions, meets all effluent requirements.

The County’s operational staff shall operate the plant for a 180-day period, collecting routine operating data, data required by the effluent permit, and any additional data necessary to demonstrate the “test passing” conditions. The test shall pass if all effluent permit limits are met.

10.4 ACCEPTANCE TEST REPORT

Within 45 days of the completion of each part of Acceptance Testing, the PDB Company shall submit to the Owners Representative four (4) copies of a chapter corresponding to this part of Acceptance Testing. When all Acceptance Testing is complete, the PDB Company shall prepare a comprehensive Acceptance Testing Report, which shall include each of the chapters previously submitted. The PDB Company shall submit to the Owners Representative four (4) copies of the Acceptance Testing Report within 45 days of the completion of all parts of Acceptance Testing.

The Acceptance Testing report shall include, but not be limited to, the following:

- A certification stating that each part of Acceptance Testing was conducted in accordance with the approved Acceptance Testing plan.
- A certification stating that the results of the Acceptance Testing comply with the applicable unit and process design criteria, Performance Criteria, and the requirements of this Appendix and the PDB Contract.
- Copies of the original data sheets, log sheets, and all calculations used to determine performance during Acceptance Testing.
- All required process parameters measured, recorded, or calculated during the tests including all laboratory analysis results.
• All necessary certifications relating to testing, evaluation, analyses, and performance.
• Record of equipment and system outages, failures, repairs, and preventative maintenance.
• Data and supporting calculations demonstrating the ability of the plant to meet the requirements of this Appendix.
• Summary of test results and conclusive evidence of compliance with all test requirements.
• Any other data reasonably requested by the Owners Representative to be included in the Acceptance Testing Report.

In the event the Acceptance Test Report does not demonstrate that the plant has met the applicable Performance Criteria, the PDB Company shall make the appropriate modifications and re-test in accordance with the PDB Contract and these appendices.
APPENDIX 11: GUARANTEES AND ASSOCIATED RISK

11.1 GENERAL

The County desires that each proposer evaluates the required PDB Guarantees and risk allocation associated to the Tanner’s Bridge WWTF Expansion project and detail in the technical approach the proposer’s plan to mitigate the risk and ensure that the guarantees are achieved.

It is the County’s intent in providing the information in this appendix to give the proposers a better understanding of the County’s overall goals and objectives for the plant’s operational and performance guarantees and equipment warranties. It is not the intention of the County to provide information on all risks associated in the PDB Project. If the information in this appendix is in conflict with the terms and conditions of the PDB Contract, the PDB Contract shall govern.

The project is a Progressive Design Build delivery project which is performance based. The PDB Company shall be responsible to seek clarification of any specification contained in the PDB RFQP, the PDB Contract and the Appendices that precludes achieving the expected performance.

11.2 PERFORMANCE GUARANTEE

The PDB Company shall be responsible for the Design and Construction of the plant to meet any and all permit, regulatory and County requirements relating to the plant’s effluent quality. Failure to meet the required effluent quality will result in the PDB Company obligations set forth in the PDB Contract, including, but not limited to, paying any fines levied by the regulatory agencies until the plant effluent is brought into compliance with the NPDES permit. Should the effluent quality performance fail to be met, the PDB Company shall immediately take all necessary action to correct deficiencies, at no additional cost to the County, to make the plant meet the effluent quality requirements. Additionally, during the first year of operations the PDB Company shall supply engineering and construction services and corrective action to correct any material condition that is responsible for causing an NPDES permit violation.

Refer to the approved DDR for expected Plant effluent limits

11.3 RISK

11.3.1 Equipment 12-Month Operations

To be determined during the Phase 2 delivery process.

11.3.2 Progressive Design Build Guaranteed Maximum Price (GMP)

Barrow County has requested proposals for the Design and Construction of the TBWWTF. The method of project delivery is Progressive Design Build. In the PDB RFQP, the PDB Contract and the Appendices, Barrow County has indicated the technical requirements, performance guarantees, and level of effort required for this PDB Project. The County requires that the Progressive Design Build GMP from the proposer be the total compensation for the design, construction, and acceptance of the PDB Work in
accordance with the PDB Contract. The risk associated with this project is detailed in this PDB RFQP and the PDB Contract. The proposer will evaluate this risk, provide detailed technical explanation of its plans to mitigate the risk and to successfully complete the project. The successful proposer shall assume the total of the risk as detailed in the PDB RFQP, PDB Contract and the Appendices and will propose a Progressive Design Build GMP that reflects all the risk.

11.3.3 Subsurface Risk

The County makes no representation or warranty with respect to the Site. Based on its inspections of the Site, and other inquiries and investigations made by the PDB Company prior to the Contract Date, which the Company acknowledges to be sufficient for this purpose, the PDB Company assumes the risk of the adequacy and sufficiency of the "as-is" condition of the Site

It is specifically understood that the PDB Company's assumption of the "as-is" risk of the condition of the Site shall not extend to Pre-Existing Environmental Conditions. No other Uncontrollable Circumstance, however, shall relieve or limit the PDB Company's assumption of the "as-is" risk

11.4 SECURITY

The PDB Company will be required to provide the following forms of Surety for this project in accordance with the PDB Contract:

- Bid Bond - Equal to 5% of the Phase 1 Design Services price.
- Performance Bond—equal to 100% of the Progressive Design Build GMP
- Payment Bond—equal to 100% of the Progressive Design Build GMP
- Insurances – The PDB Company shall provide insurances as required in the RFQP and PDB Contract.
- Warranties—all major pieces of equipment, processes and facilities shall be warranted for a period of not less than two (2) years by the manufacturer of the equipment or the PDB Company. If the manufacturer’s standard warranty is less than the two-year required period, the PDB Company shall be responsible for the additional costs to meet the two-year warranty period. The PDB Company shall assign all warranties for any equipment or process to the County.
APPENDIX 12: ATTACHMENTS

Attachments and supporting documents can be downloaded at the Barrow County website, http://www.barrowga.org/departments/bids-RFQPs.aspx. The accuracy of these documents cannot be guaranteed.

**Attachment 1:** 2018 Waste Load Allocation Amendment Request to EPD

**Attachment 2:** EPD Approval of 2018 Waste Load Allocation Amendment Request

**Attachment 3:** Tanner’s Bridge WWTF 5.0 MGD NPDES Permit No. GA0039314 expires September 30, 2020

**Attachment 4:** 2018 Tanner’s Bridge WWTF 1.0 MGD Mechanical Plant Design Development Report Amendment to Tanner’s Bridge Qualifluent 5.0 MGD WWTF Design Development Report

**Attachment 5:** WWTF Improvements and Discharge Forcemain Preliminary Plan
April 27, 2018

Mr. Benoit Causse  
Municipal Permitting Unit  
Wastewater Regulatory Program  
Environmental Protection Division  
2 Martin Luther King Jr Drive.  
Suite 1152 – East Tower  
Atlanta, GA 30334

RE: Barrow County  
Tanner’s Bridge WWTF – Request to Revise the Waste Load Allocation  
EPD Project No. 25-134 & 28-208

Dear Mr. Causse:

On behalf of the Barrow County Board of Commissioners, we are requesting the existing 5.0 MGD Waste Load Allocation for a wastewater discharge to the Apalachee River be amended to include flow rates of 0.75 MGD, 1.0 MGD, 1.5 MGD, 2.0 MGD and the existing 5.0 MGD. For reference the EPD Waste Load Allocation Approval from June 5, 2006 is attached.

Please note that Barrow County is willing to keep the same permit limitations for these new requested flow rates as was approved for the 5.0 MGD flow rate.

Please contact us if you have any questions or need additional information.

Sincerely,

ENGINEERING MANAGEMENT, INC.

Chip McGaughey, P.E.  
Assistant Vice President

Cc. Mr. Sam Mark, Barrow County  
Mr. Mark Whiddon, Barrow County
June 5, 2006

Chairman Douglas H. Garrison
Barrow County Board of Commissioners
233 East Broad Street
Winder, Georgia 30680

RE: EPD Project No. 25-134
Wasteload Allocation - Apalachee River
Barrow County-Tanners Bridge (5.0 MGD)
Barrow County

Dear Chairman Garrison:

The Georgia Environmental Protection Division (EPD) has completed its wasteload allocation (WLA) analysis for the proposed point discharge of treated wastewater from the Barrow County-Tanners Bridge wastewater treatment facility into the Apalachee River.

The attached WLA is valid for one year from the date of this letter unless a written extension is requested and granted.

The City will be required to perform an antidegradation analysis justifying the proposed discharge. Enclosed is a copy of our Planning for Domestic Wastewater Systems guidance that addresses the required format for the antidegradation review.

The County will be required to prepare a Watershed Assessment and a Watershed Protection Plan for the watershed corresponding to the existing and planned service area of the wastewater treatment facility. The County must submit these documents to EPD for review and approval. An approved Watershed Assessment and Watershed Protection Plan must be completed before the facility will be authorized to discharge. The Watershed Protection Plan, which results from the assessment, must be implemented to control or reduce any impacts to the water quality in the watershed.
Final approval of the project is contingent upon submittal and concurrence/approval of an Antidegradation Analysis and Economic Review, Environmental Information Document, Design Development Report, plans and specifications, as well as completion of permit public notice requirements and issuance of the permit.

If you have any questions pertaining to this project, please contact me at (404) 675-1601.

Sincerely,

Mark Beebe, Engineer
Engineering & Technical Support Program

cc:  Mr. Herb Feldman, HSF Engineering
     Mr. David Bullard, EPD-PCEP
     Mr. Paul Lamarre, EPD-WPMP
     EPD–Northeast District Office
### Proposed Barrow County-Tanners Bridge Wasteload Allocation

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Annual Permit Limitations (lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow, MGD</td>
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</tr>
<tr>
<td>5-Day Biochemical Oxygen Demand (BOD₅), mg/l</td>
<td>10</td>
</tr>
<tr>
<td>Total Suspended Solids (TSS), mg/l</td>
<td>20</td>
</tr>
<tr>
<td>Ammonia Nitrogen (NH₃-N), mg/l</td>
<td>2.0</td>
</tr>
<tr>
<td>Total Phosphorus (as P), mg/l</td>
<td>1.0</td>
</tr>
<tr>
<td>Ortho-Phosphorus</td>
<td>Monitor</td>
</tr>
<tr>
<td>Fecal Coliform Bacteria, MPN/100 ml</td>
<td>200</td>
</tr>
<tr>
<td>Dissolved Oxygen (DO) (minimum), mg/l</td>
<td>5.0</td>
</tr>
<tr>
<td>Total Residual Chlorine (TRC), (daily max.), mg/l</td>
<td>0.017</td>
</tr>
<tr>
<td>pH, Standard Units</td>
<td>6.0 - 9.0</td>
</tr>
</tbody>
</table>

1. Values are monthly averages except as noted.
August 13, 2018

Honorable Pat Graham, Chairman
Barrow County Board of Commissioners
30 North Broad Street
Winder, GA 30680

RE: Tanners Bridge WPCP
NPDES Permit No. – GA0039314
Wasteload Allocation Request
Phased Discharge up to 5.0 MGD
EPD # 2018-096
Barrow County

Honorable Chairman Graham:

The Watershed Planning and Monitoring Program (WPMP) has completed the evaluation of the wasteload allocation request for a new year-round discharge of 0.75 MGD, 1.0 MGD, 1.5 MGD, 2.0 MGD, and 5.0 MGD of treated domestic wastewater associated with the Tanners Bridge WPCP (GA0039314) into the Apalachee River in the Oconee River Basin.

The wasteload allocation is valid for one year from the date of this letter unless a written extension is requested and granted. This wasteload is provided for planning purposes only.

<table>
<thead>
<tr>
<th>Constituent/Parameter</th>
<th>Permit Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effluent Flow Rate (MGD)</td>
<td>0.75</td>
</tr>
<tr>
<td>Five-Day Biochemical Oxygen Demand (mg/L)</td>
<td>10</td>
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<tr>
<td>Total Suspended Solids (mg/L)</td>
<td>20</td>
</tr>
<tr>
<td>Ammonia, as N (mg/L)</td>
<td>5.0</td>
</tr>
<tr>
<td>Dissolved Oxygen, Minimum (mg/L)</td>
<td>5.0</td>
</tr>
<tr>
<td>Fecal Coliform Bacteria (#/100mL)</td>
<td>200</td>
</tr>
<tr>
<td>pH, Minimum – Maximum (S.U.)</td>
<td>6.0 – 9.0</td>
</tr>
<tr>
<td>Total Phosphorus, as P (mg/L)</td>
<td>1.0</td>
</tr>
</tbody>
</table>
(Table continued below)

<table>
<thead>
<tr>
<th>Constituent/Parameter (1)</th>
<th>Permit Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ortho-Phosphate, as P (mg/L)</td>
<td>Monitor</td>
</tr>
<tr>
<td>Total Kjeldahl Nitrogen (mg/L)</td>
<td>Monitor</td>
</tr>
<tr>
<td>Organic Nitrogen, as N (mg/L)</td>
<td>Monitor</td>
</tr>
<tr>
<td>Nitrate-Nitrite, as N (mg/L)</td>
<td>Monitor</td>
</tr>
</tbody>
</table>

(1) Values are maximum monthly averages except as noted

Lake standards are being established for Lakes Oconee and Sinclair. It is anticipated that a TP limit of 0.5 mg/L will be needed to meet the lake criteria.

If you should have any questions, please do not hesitate to contact me at 404-463-1834 or Josh.Hayes@dnr.ga.gov.

Sincerely,

Josh Hayes
Municipal Permitting Unit
Wastewater Regulatory Program

Cc: Mr. Chip McGaughey, P.E. – EMI Engineering Management, (chipm@eminc.biz)
September 16, 2015

Honorable Pat Graham, Chairman
Barrow County Board of Commissioners
30 N. Broad Street
Winder, GA 30680

RE: Tanner’s Bridge
Water Pollution Control Plant (WPCP)
NPDES Permit No. GA0039314
(Barrow County)

Dear Chairman Graham:

Pursuant to the Georgia Water Quality Control Act, as amended; the Federal Water Pollution Control Act, as amended; and the Rules and Regulations promulgated thereunder, we have today issued the attached National Pollutant Discharge Elimination System (NPDES) permit for the referenced wastewater treatment facility.

Your facility has been assigned to the following EPD office for reporting and compliance. Signed copies of all required reports shall be submitted to the following address:

Georgia Environmental Protection Division
Watershed Compliance Program
2 Martin Luther King Jr. Drive
Suite 1152 East
Atlanta, Georgia 30334

Please be advised that on and after the effective date indicated in the attached NPDES permit, the permittee must comply with all the terms, conditions and limitations of this permit.

If you have any questions, please contact Benoit Causse at 404-463-4958 or benoit.causse@dnr.ga.gov.

Sincerely,

Judson H. Turner
Director

JHT\bsc
Attachment
STATE OF GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

AUTHORIZATION TO DISCHARGE UNDER THE
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In accordance with the provisions of the Georgia Water Quality Control Act (Georgia Laws 1964, p. 416, as amended), hereinafter called the State Act; the Federal Water Pollution Control Act, as amended (33 U.S. C. 1251 et seq.), hereinafter called the Federal Act; and the Rules and Regulations promulgated pursuant to each of these Acts,

Barrow County Board of Commissioner
30 North Broad Street
Winder, Georgia 30680

is authorized to discharge from a facility located at

Tanner's Bridge Water Pollution control Plant (WPCP)
1113 Briscoe Mill Road
Bethlehem, Georgia 30620
(Barrow County)

to receiving waters

Apalachee River to the Oconee River
(Oconee River Basin)

in accordance with effluent limitations, monitoring requirements and other conditions set forth in the permit.

This permit is issued in reliance upon the permit application signed on March 20, 2015, any other applications upon which this permit is based, supporting data entered therein or attached thereto, and any subsequent submittal of supporting data.

This permit shall become effective on October 1, 2015.

This permit and the authorization to discharge shall expire at midnight, September 30, 2020.

Issued this 16th day of September, 2015.

[Signature]
Director,
Environmental Protection Division
PART I

EPD is the Environmental Protection Division of the Department of Natural Resources.

The Federal Act referred to is The Clean Water Act.

The State Act referred to is The Water Quality Control Act (Act No. 870).

The State Rules referred to are The Rules and Regulations for Water Quality Control (Chapter 391-3-6).

A. SPECIAL CONDITIONS

1. MONITORING

The concentration of pollutants in the discharge will be limited as indicated by the table(s) labeled "Effluent Limitations and Monitoring Requirements." The effluent shall meet the requirements in the table(s) or the condition in paragraph I.A.1.a., whichever yields the higher quality effluent.

a. For 5 day biochemical oxygen demand (BOD$_5$) and total suspended solids (TSS), the arithmetic mean of the values of the effluent samples collected during a month shall not exceed 15 percent of the arithmetic mean of values for influent samples collected at approximately the same times (85 percent removal). In accordance with Chapter 391-3-6-.06(4)(d) 2. of the State Rules, under certain conditions the 85 percent removal requirement may not be applicable, as specified in 40 CFR 133.

b. The monthly average, other than for fecal coliform bacteria, is the arithmetic mean of values obtained for samples collected during a calendar month.

c. The weekly average, other than for fecal coliform bacteria, is the arithmetic mean of values obtained for samples collected during a 7 day period. The week begins 12:00 midnight Saturday and ends at 12:00 midnight the following Saturday. To define a different starting time for the sampling period, the permittee must notify the EPD in writing. For reporting required by I.C.2. of this permit, a week that starts in one month and ends in another month shall be considered part of the second month. The permittee may calculate and report the weekly average as a 7 day moving average.

d. Fecal coliform bacteria will be reported as the geometric mean of the values for the samples collected during the time periods in I.A.1.b. and I.A.1.c.

e. Untreated wastewater influent samples required by I.B. shall be collected before any return or recycle flows. These flows include returned activated sludge, supernatants, centrates, filtrates, and backwash.

f. Effluent samples required by I.B. of this permit shall be collected after the final treatment process and before discharge to receiving waters. Composite samples may be collected before chlorination with written EPD approval.

g. A composite sample shall consist of a minimum of 13 subsamples collected at least once every 2 hours for at least 24 hours and shall be composited proportionately to flow.

h. Flow measurements shall be conducted using the flow measuring device(s) in accordance with the approved design of the facility. If instantaneous measurements are required, then the permittee shall have a primary flow measuring device that is correctly installed and maintained. If continuous recording measurements are required, then flow
measurements must be made using continuous recording equipment. Calibration shall be maintained of the continuous recording instrumentation to ± 10% of the actual flow.

Flow shall be measured manually to check the flow meter calibration at a frequency of once a month. If secondary flow instruments are in use and malfunction or fail to maintain calibration as required, the flow shall be computed from manual measurements or by other method(s) approved by EPD until such time as the secondary flow instrument is repaired. For facilities which utilize alternate technologies for measuring flow, the flow measurement device must be calibrated semi-annually by qualified personnel.

Records of the calibration checks shall be maintained.

i. If secondary flow instruments malfunction or fail to maintain calibration as required in I.A.1.h., the flow shall be computed from manual measurements taken at the times specified for the collection of composite samples.

j. Some parameters must be analyzed to the detection limits specified by the EPD. These parameters will be reported as "not detected" when they are below the detection limit and will then be considered in compliance with the effluent limit. The detection limit will also be reported.

2. SLUDGE DISPOSAL REQUIREMENTS

Sludge shall be disposed of according to the regulations and guidelines established by the EPD and the Federal Act section 405(d) and (e), and the Resource Conservation and Recovery Act (RCRA). In land applying nonhazardous municipal sewage sludge, the permittee shall comply with the general criteria outlined in the most current version of the EPD "Guidelines for Land Application of Sewage Sludge (Biosolids) at Agronomic Rates" and with the State Rules, Chapter 391-3-6-.17. Before disposing of municipal sewage sludge by land application or any method other than co-disposal in a permitted sanitary landfill, the permittee shall submit a sludge management plan to EPD for written approval. This plan will become a part of the NPDES Permit after approval and modification of the permit. The permittee shall notify the EPD of any changes planned in an approved sludge management plan.

If an applicable management practice or numerical limitation for pollutants in sewage sludge is promulgated under Section 405(d) of the Federal Act after approval of the plan, then the plan shall be modified to conform with the new regulations.

3. SLUDGE MONITORING REQUIREMENTS

The permittee shall develop and implement procedures to ensure adequate year-round sludge disposal. The permittee shall monitor and maintain records documenting the quantity of sludge removed from the facility. Records shall be maintained documenting that the quantity of solids removed from the facility equals the solids generated on an average day. The total quantity of sludge removed from the facility during the reporting period shall be reported each month with the Discharge Monitoring Reports as required under Part I.C.2. of this permit. The quantity shall be reported on a dry weight basis (dry tons).

Pond treatment systems are required to report the total quantity of sludge removed from the facility only during the months that sludge is removed.
4. INTRODUCTION OF POLLUTANTS INTO THE PUBLICLY OWNED TREATMENT WORKS (POTW)

The permittee must notify EPD of:

a. Any new introduction of pollutants into the POTW from an indirect discharger that would be subject to Sections 301 or 306 of the Federal Act if the pollutants were directly discharged to a receiving stream; and

b. Any substantial change in the volume or character of pollutants from a source that existed when the permit was issued.

This notice shall include information on the quality and quantity of the indirect discharge introduced and any anticipated impact on the quantity or quality of effluent to be discharged from the POTW.

5. EFFLUENT TOXICITY AND BIOMONITORING REQUIREMENTS

The permittee shall comply with effluent standards or prohibitions established by section 307(a) of the Federal Act and with Chapter 391-3-6-.03(5)(e) of the State Rules and may not discharge toxic pollutants in concentrations or combinations that are harmful to humans, animals, or aquatic life.

If toxicity is suspected in the effluent, the EPD may require the permittee to perform any of the following actions:

a. Acute biomonitoring tests;

b. Chronic biomonitoring tests;

c. Stream studies;

d. Priority pollutant analyses;

e. Toxicity reduction evaluations (TRE); or

f. Any other appropriate study.

The EPD will specify the requirements and methodologies for performing any of these tests or studies. Unless other concentrations are specified by the EPD, the critical concentration used to determine toxicity in biomonitoring tests will be the effluent instream wastewater concentration (IWC) based on the permitted monthly average flow of the facility and the critical low flow of the receiving stream (7Q10). The endpoints that will be reported are the effluent concentration that is lethal to 50% of the test organisms (LC50) if the test is for acute toxicity and the no observed effect concentration (NOEC) of effluent if the test is for chronic toxicity.

The permittee must eliminate effluent toxicity and supply the EPD with data and evidence to confirm toxicity elimination.
B. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

The discharge from the water reclamation facility shall be limited and monitored by the permittee as specified below starting on the date EPD provides approval of construction completion and written authorization to operate:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Discharge limitations in mg/L (kg/day) unless otherwise specified</th>
<th>Monitoring Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Monthly Average</td>
<td>Weekly Average</td>
</tr>
<tr>
<td>Flow (MGD)</td>
<td>5.0</td>
<td>6.25</td>
</tr>
<tr>
<td>Five-Day Biochemical Oxygen Demand</td>
<td>10.0 (190)</td>
<td>15.0 (237)</td>
</tr>
<tr>
<td>Total Suspended Solids</td>
<td>20 (379)</td>
<td>30 (474)</td>
</tr>
<tr>
<td>Ammonia, as N</td>
<td>1.7 (32.2)</td>
<td>2.6 (40.3)</td>
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<tr>
<td>Total Phosphorus, as P</td>
<td>1.0 (19.0)</td>
<td>1.5 (23.7)</td>
</tr>
<tr>
<td>Fecal Coliform Bacteria (#/100 mL)</td>
<td>200</td>
<td>400</td>
</tr>
</tbody>
</table>

(Effluent limitations continued on the next page)
### B. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

<table>
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<th>Parameters</th>
<th>Discharge limitations in mg/L unless otherwise specified</th>
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</thead>
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<tr>
<td>pH, Minimum – Maximum (Standard Unit)</td>
<td>6.0 – 8.5</td>
<td>Seven Days/Week</td>
</tr>
<tr>
<td>Dissolved Oxygen, Minimum</td>
<td>6.0</td>
<td>Seven Days/Week</td>
</tr>
<tr>
<td>Ortho-Phosphate, as P&lt;sup&gt;(1)&lt;/sup&gt;</td>
<td>Report</td>
<td>One Day/Month</td>
</tr>
<tr>
<td>Organic Nitrogen, as N&lt;sup&gt;(2)&lt;/sup&gt;</td>
<td>Report</td>
<td>One Day/Month</td>
</tr>
<tr>
<td>Nitrate-Nitrite, as N&lt;sup&gt;(2)&lt;/sup&gt;</td>
<td>Report</td>
<td>One Day/Month</td>
</tr>
<tr>
<td>Total Kjeldahl Nitrogen&lt;sup&gt;(2)&lt;/sup&gt;</td>
<td>Report</td>
<td>One Day/Month</td>
</tr>
<tr>
<td>Long Term Biochemical Oxygen Demand&lt;sup&gt;(3)&lt;/sup&gt;</td>
<td>Report</td>
<td>See Below</td>
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<tr>
<td>Whole Effluent Toxicity (WET) Test&lt;sup&gt;(4)&lt;/sup&gt;</td>
<td>Report NOEC</td>
<td>See Below</td>
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<tr>
<td>Priority Pollutants&lt;sup&gt;(5)&lt;/sup&gt;</td>
<td>Report</td>
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<table>
<thead>
<tr>
<th>Measurement Frequency</th>
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<tr>
<td>Seven Days/Week</td>
<td>Grab</td>
<td>Effluent</td>
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<tr>
<td>Seven Days/Week</td>
<td>Grab</td>
<td>Effluent</td>
</tr>
<tr>
<td>One Day/Month</td>
<td>Composite</td>
<td>Effluent</td>
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<tr>
<td>One Day/Month</td>
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</tr>
<tr>
<td>See below</td>
<td>Grab</td>
<td>Effluent</td>
</tr>
</tbody>
</table>

<sup>(1)</sup> Total Phosphorus and Ortho-Phosphate must be analyzed from the same sample

<sup>(2)</sup> Ammonia, Organic Nitrogen, Nitrate-Nitrite, and Total Kjeldahl Nitrogen must be analyzed from the same sample

<sup>(3)</sup> Refer to Part I.C.9. LONG TERM BIOCHEMICAL OXYGEN DEMAND

<sup>(4)</sup> Refer to Part I.C.10. CHRONIC WHOLE EFFLUENT TOXICITY

<sup>(5)</sup> Refer to Part I.C.11. PRIORITY POLLUTANTS
C. MONITORING AND REPORTING

1. REPRESENTATIVE SAMPLING

Samples and measurements of the monitored waste shall represent the volume and nature of the waste stream. The permittee shall maintain a written sampling and monitoring schedule.

2. REPORTING

a. Monitoring results obtained during the calendar month shall be summarized for each month and reported on the Discharge Monitoring Report (DMR). The results of each sampling event shall be reported on the Operating Monitoring Report (OMR) and submitted as an attachment to the DMR. The DMR and OMR and any other required forms, reports and/or information shall be completed, signed and certified by a principal executive officer or ranking elected official, or by a duly authorized representative of that person who has the authority to act for or on behalf of that person, and submitted to EPD, postmarked no later than the 15th day of the month following the reporting period.

b. However, upon final approval from EPD to use the online NetDMR application for the submittal of DMRs and OMRs required by this permit, the permittee shall submit the DMRs and OMRs to EPD utilizing the online NetDMR submittal process. The permittee shall submit the DMR no later than 11:59 p.m. on the 15th day of the month following the reporting period.

c. Signed copies of these and all other reports required herein, unless otherwise stated, shall be submitted to the EPD Office listed on the permit issuance letter signed by the Director of EPD.

d. All instances of noncompliance not reported under Part I.B. and Part II.A. shall be reported at the time the operation monitoring report is submitted.

e. Unless otherwise specified in this permit, quarterly samples shall be taken during the periods January-March, April-June, July-September, and October-December. Semiannual samples shall be taken during the periods January-June and July-December. Results from these samples shall be reported to the EPD on the monitoring report for the last month of the period. Results of annual samples will be reported on the June monitoring report.

3. MONITORING PROCEDURES

All analytical methods, sample containers, sample preservation techniques, and sample holding times must be consistent with the techniques and methods listed in 40 CFR Part 136. The analytical method used shall be sufficiently sensitive. EPA-approved methods must be applicable to the concentration ranges of the NPDES permit samples.

4. RECORDING OF RESULTS

For each required parameter analyzed, the permittee shall record:

a. The exact place, date, and time of sampling, and the person(s) collecting the sample. For flow proportioned composite samples, this shall include the instantaneous flow and the corresponding volume of each sample aliquot, and other information relevant to document flow proportioning of composite samples;
5. ADDITIONAL MONITORING BY PERMITTEE

If the permittee monitors required parameters at the locations designated in I.B. more frequently than required, the permittee shall analyze all samples using approved analytical methods specified in I.C.3. The results of this additional monitoring shall be included in calculating and reporting the values on the Discharge Monitoring Report forms. The permittee shall indicate the monitoring frequency on the report. The EPD may require in writing more frequent monitoring, or monitoring of other pollutants not specified in this permit.

6. RECORDS RETENTION

The permittee shall retain records of:

a. All laboratory analyses performed including sample data, quality control data, and standard curves;

b. Calibration and maintenance records of laboratory instruments;

c. Calibration and maintenance records and recordings from continuous recording instruments;

d. Process control monitoring records;

e. Facility operation and maintenance records;

f. Copies of all reports required by this permit;

g. All data and information used to complete the permit application; and

h. All monitoring data related to sludge use and disposal.

These records shall be kept for at least three years. Sludge handling records must be kept for at least five years. Either period may be extended by EPD written notification.

7. PENALTIES

Both the Federal and State Acts provide that any person who falsifies or tampers with any monitoring device or method required under this permit, or who makes any false statement, representation, or certification in any record submitted or required by this permit shall, if convicted, be punished by a fine or by imprisonment or by both. The Acts include procedures for imposing civil penalties for violations or for negligent or intentional failure or refusal to comply with any final or emergency order of the Director of the EPD.
8. WATERSHED PROTECTION PLAN

The permittee has a watershed protection plan that has been approved by EPD. The permittee’s approved watershed protection plan shall be enforceable through this permit.

Each June 30th the permittee is to submit the following to EPD:

a. An annual certification statement documenting that the plan is being implemented as approved. The certification statement shall read as follows: “I certify, under penalty of law, that the watershed protection plan is being implemented. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.”

b. All watershed plan data collected during the previous year in an electronic format. This data shall be archived using a digital format such as a spreadsheet developed in coordination with EPD. All archived records, data, and information pertaining to the watershed protection plan shall be maintained permanently.

c. A progress report that provides a summary of the BMPs that have been implemented and documented water quality improvements. The progress report shall also include any necessary changes to the Watershed Protection Plan.

9. LONG-TERM BIOCHEMICAL OXYGEN DEMAND TESTING

The permittee shall perform a 120-day Long-Term BOD test once during the permit cycle. The test should be performed on an effluent sample collected during the critical period from June 1 through September 30. The results of this test shall be provided to EPD prior to renewal of the permit.

10. CHRONIC WHOLE EFFLUENT TOXICITY (WET)

The permittee shall conduct four quarterly chronic whole effluent toxicity (WET) tests within the first year after receiving EPD written authorization to commence operation under Part I.B. effluent limitations, with the first WET test being conducted within 90 days of this authorization. The testing must be conducted in accordance with the most current U.S. Environmental Protection Agency (EPA) chronic aquatic toxicity testing manuals. The referenced document is entitled Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, 4th Edition, U.S. EPA, 821-R-02-013, October 2002. Definitive tests must be run on the same samples concurrently using both Ceriodaphnia dubia and Fathead Minnows (Pimephales promelas). The testing must include a dilution equal to the facility’s instream wastewater concentration (IWC) of 65%.

EPD will evaluate the WET tests submitted to determine whether toxicity has been demonstrated. An effluent discharge will not be considered toxic if the No Observed Effect Concentration (NOEC) is greater than or equal to the Instream Wastewater Concentration (IWC) of 65%. If the test results indicate effluent toxicity, the permittee may be required to perform additional WET tests or studies in accordance with Part I.C.5 of the permit and/or the permit may be modified to include a chronic WET limit.
11. PRIORITY POLLUTANTS

The permittee must conduct three scans of the priority pollutants during the first year after receiving EPD written authorization to commence operation under Part I.B. effluent limitations (5.0 MGD), with the first test being conducted within 90 days of this authorization. The priority pollutant scans must represent seasonal variation. Total recoverable mercury must be sampled and analyzed using EPA Method 1631E. If substances are measured at levels of concern, then the permittee may be required to perform additional priority pollutant analyses in accordance with Part I.C.5 or the permit may be modified to include effluent limitations for priority pollutants.
PART II

A. MANAGEMENT REQUIREMENTS

1. FACILITY OPERATION

The permittee shall maintain and operate efficiently all treatment or control facilities and related equipment installed or used by the permittee to achieve compliance with this permit. Efficient operation and maintenance include effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. Back-up or auxiliary facilities or similar systems shall be operated only when necessary to achieve permit compliance.

2. CHANGE IN DISCHARGE

Any anticipated facility expansions, or process modifications which will result in new, different, or increased discharges of pollutants requires the submission of a new NPDES permit application. If the changes will not violate the permit effluent limitations, the permittee may notify EPD without submitting an application. The permit may then be modified to specify and limit any pollutants not previously limited.

3. NONCOMPLIANCE NOTIFICATION

If, for any reason the permittee does not comply with, or will be unable to comply with any effluent limitations specified in the permittee's NPDES permit, the permittee shall provide EPD with an oral report within 24 hours from the time the permittee becomes aware of the circumstances followed by a written report within five (5) days of becoming aware of such condition. The written submission shall contain the following information:

a. A description of the noncompliance and its cause; and

b. The period of noncompliance, including the exact date and times; or, if not corrected, the anticipated time the noncompliance is expected to continue; and

c. The steps taken to reduce, eliminate, and prevent recurrence of the noncomplying discharge.

4. ANTICIPATED NONCOMPLIANCE NOTIFICATION

The permittee shall give written notice to the EPD at least 10 days before:

a. Any planned changes in the permitted facility; or

b. Any activity which may result in noncompliance with the permit.

5. OTHER NONCOMPLIANCE

The permittee must report all instances of noncompliance not reported under other specific reporting requirements, at the time monitoring reports are submitted. The reports shall contain the information required under conditions of twenty-four hour reporting.
6. OPERATOR CERTIFICATION REQUIREMENTS

The person responsible for the daily operation of the facility must be a Class I Certified Operator in compliance with the Georgia State Board of Examiners for Certification of Water and Wastewater Plant Operators and Laboratory Analysts Act, as amended, and as specified by Subparagraph 391-3-6-.12 of the Rules and Regulations for Water Quality Control. All other operators must have the minimum certification required by this Act.

7. LABORATORY ANALYST CERTIFICATION REQUIREMENTS

Laboratory Analysts must be certified in compliance with the Georgia State Board of Examiners for Certification of Water and Wastewater Treatment Plant Operators and Laboratory Analysts Act, as amended.

8. BYPASSING

Any diversion of wastewater from or bypassing of wastewater around the permitted treatment works is prohibited, except if:

a. Bypassing is unavoidable to prevent loss of life, personal injury, or severe property damage;

b. There are no feasible alternatives to bypassing; and

c. The permittee notifies the EPD at least 10 days before the date of the bypass.

Feasible alternatives to bypassing include use of auxiliary treatment facilities and retention of untreated waste. The permittee must take all possible measures to prevent bypassing during routine preventative maintenance by installing adequate back-up equipment.

The permittee shall operate the facility and the sewer system to minimize discharge of pollutants from combined sewer overflows or bypasses and may be required by the EPD to submit a plan and schedule to reduce bypasses, overflows, and infiltration.

Any unplanned bypass must be reported following the requirements for noncompliance notification specified in II.A.3. The permittee may be liable for any water quality violations that occur as a result of bypassing the facility.

9. POWER FAILURES

If the primary source of power to this water pollution control facility is reduced or lost, the permittee shall use an alternative source of power to reduce or control all discharges to maintain permit compliance.

10. ADVERSE IMPACT

The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge disposal which might adversely affect human health or the environment.

11. NOTICE CONCERNING ENDANGERING WATERS OF THE STATE

Whenever, because of an accident or otherwise, any toxic or taste and color producing substance, or any other substance which would endanger downstream users of the waters of the State or would damage property, is discharged into such waters, or is so placed that it might flow, be washed, or fall into them, it shall be the duty of the person in charge of such substances
at the time to forthwith notify EPD in person or by telephone of the location and nature of the
danger, and it shall be such person's further duty to immediately take all reasonable and
necessary steps to prevent injury to property and downstream users of said water.

Spills and Major Spills:

A "spill" is any discharge of raw sewage by a Publicly Owned Treatment Works (POTW) to the
waters of the State.

A "major spill" means:

1. The discharge of pollutants into waters of the State by a POTW that exceeds the weekly
average permitted effluent limit for biochemical oxygen demand (5-day) or total
suspended solids by 50 percent or greater in one day, provided that the effluent
discharge concentration is equal to or greater than 25 mg/L for biochemical oxygen
demand or total suspended solids.

2. Any discharge of raw sewage that 1) exceeds 10,000 gallons or 2) results in water
quality violations in the waters of the State.

"Consistently exceeding effluent limitation" means a POTW exceeding the 30 day average limit
for biochemical oxygen demand or total suspended solids for at least five days out of each
seven day period during a total period of 180 consecutive days.

The following specific requirements shall apply to POTW's. If a spill or major spill occurs, the
owner of a POTW shall immediately:

a. Notify EPD, in person or by telephone, when a spill or major spill occurs in the system.

b. Report the incident to the local health department(s) for the area affected by the incident.
The report at a minimum shall include the following:

1. Date of the spill or major spill;
2. Location and cause of the spill or major spill;
3. Estimated volume discharged and name of receiving waters; and
4. Corrective action taken to mitigate or reduce the adverse effects of the spill or
major spill.

c. Post a notice as close as possible to where the spill or major spill occurred and where
the spill entered State waters and also post additional notices along portions of the
waterway affected by the incident (i.e. bridge crossings, boat ramps, recreational areas,
and other points of public access to the affected waterway). The notice at a minimum
shall include the same information required in 11(b)(1-4) above. These notices shall
remain in place for a minimum of seven days after the spill or major spill has ceased.

d. Within 24 hours of becoming aware of a spill or major spill, the owner of a POTW shall
report the incident to the local media (television, radio, and print media). The report shall
include the same information required in 11(b)(1-4) above.

e. Within five (5) days (of the date of the spill or major spill), the owner of a POTW shall
submit to EPD a written report which includes the same information required in 11(b)(1-
4) above.

f. Within 7 days (after the date of a major spill), the owner of a POTW responsible for the
major spill, shall publish a notice in the largest legal organ of the County where the
incident occurred. The notice shall include the same information required in 11(b)(1-4) above.

g. The owner of a POTW shall immediately establish a monitoring program of the receiving waters affected by a major spill or by consistently exceeding an effluent limit, with such monitoring being at the expense of the POTW for at least one year. The monitoring program shall include an upstream sampling point as well as sufficient downstream locations to accurately characterize the impact of the major spill or the consistent exceedence of effluent limitations described in the definition of “Consistently exceeding effluent limitation” above. As a minimum, the following parameters shall be monitored in the receiving stream:

1. Dissolved Oxygen;
2. Fecal Coliform Bacteria;
3. pH;
4. Temperature; and
5. Other parameters required by the EPD.

The monitoring and reporting frequency as well as the need to monitor additional parameters will be determined by EPD. The results of the monitoring will be provided by the POTW owner to EPD and all downstream public agencies using the affected waters as a source of a public water supply.

h. Within 24 hours of becoming aware of a major spill, the owner of a POTW shall provide notice of a major spill to every county, municipality, or other public agency whose public water supply is within a distance of 20 miles downstream and to any others which could be potentially affected by the major spill.

12. UPSET PROVISION

Provision under 40 CFR 122.41(n)(1)-(4), regarding “Upset” shall be applicable to any civil, criminal, or administrative proceeding brought to enforce this permit.
B. RESPONSIBILITIES

1. COMPLIANCE

The permittee must comply with this permit. Any permit noncompliance is a violation of the Federal Act, State Act, and the State Rules, and is grounds for:

a. Enforcement action;

b. Permit termination, revocation and reissuance, or modification; or

c. Denial of a permit renewal application.

It shall not be a defense of the permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity to maintain compliance with the conditions of this permit.

2. RIGHT OF ENTRY

The permittee shall allow the Director of the EPD, the Regional Administrator of EPA, and their authorized representatives, agents, or employees after they present credentials to:

a. Enter the permittee's premises where a regulated activity or facility is located, or where any records required by this permit are kept;

b. Review and copy any records required by this permit;

c. Inspect any facilities, equipment, practices, or operations regulated or required by this permit; and

d. Sample any substance or parameter at any location.

3. SUBMITTAL OF INFORMATION

The permittee shall furnish any information required by the EPD to determine whether cause exists to modify, revoke and reissue, or terminate this permit or to determine compliance with this permit. The permittee shall also furnish the EPD with requested copies of records required by this permit. If the permittee determines that any relevant facts were not included in a permit application or that incorrect information was submitted in a permit application or in any report to the EPD, the permittee shall promptly submit the additional or corrected information.

4. TRANSFER OF OWNERSHIP OR CONTROL

A permit may be transferred to another person by a permittee if:

a. The permittee notifies the Director in writing at least 30 days in advance of the proposed transfer;

b. An agreement is written containing a specific date for transfer of permit responsibility including acknowledgment that the existing permittee is liable for violations up to that date, and that the new permittee is liable for violations from that date on. This agreement must be submitted to the Director at least 30 days in advance of the proposed transfer; and
c. The Director does not notify the current permittee and the new permittee within 30 days of EPD intent to modify, revoke and reissue, or terminate the permit. The Director may require that a new application be filed instead of agreeing to the transfer of the permit.

5. AVAILABILITY OF REPORTS

Except for data determined to be confidential by the Director of EPD under O.C.G.A. 12-5-26 or by the Regional Administrator of EPA under the Code of Federal Regulations, Title 40, Part 2, all reports prepared to comply with this permit shall be available for public inspection at an EPD office. Effluent data, permit applications, permittees' names and addresses, and permits shall not be considered confidential.

6. PERMIT MODIFICATION

This permit may be modified, terminated, or revoked and reissued in whole or in part during its term for causes including, but not limited to:

a. Permit violations;
b. Obtaining this permit by misrepresentation or by failure to disclose all relevant facts;
c. Changing any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge;
d. Changes in effluent characteristics; and
e. Violations of water quality standards.

The filing of a request by the permittee for permit modification, termination, revocation and reissuance, or notification of planned changes or anticipated noncompliance does not negate any permit condition.

7. CIVIL AND CRIMINAL LIABILITY

Nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance.

8. PROPERTY RIGHTS

The issuance of this permit does not convey any property rights of either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, or any infringement of Federal, State or local laws or regulations.

9. EXPIRATION OF PERMIT

The permittee shall submit an application for permit reissuance at least 180 days before the expiration date of this permit. The permittee shall not discharge after the permit expiration date without written authorization from the EPD. To receive this authorization, the permittee shall submit the information, forms, and fees required by the EPD no later than 180 days before the expiration date.

10. CONTESTED HEARINGS

Any person aggrieved or adversely affected by any action of the Director of the EPD shall petition the Director for a hearing within 30 days of notice of the action.
11. SEVERABILITY

The provisions of this permit are severable. If any permit provision or the application of any permit provision to any circumstance is held invalid, the provision does not affect other circumstances or the remainder of this permit.

12. PREVIOUS PERMITS

All previous State water quality permits issued to this facility for construction or operation are revoked by the issuance of this permit. The permit governs discharges from this facility under the National Pollutant Discharge Elimination System (NPDES).
PART III

INDUSTRIAL PRETREATMENT PROGRAM FOR PUBLICLY OWNED TREATMENT WORKS (POTW)

1. The permittee may establish and operate an approved industrial pretreatment program.

2. If the EPD determines that the permittee is required to develop a local industrial pretreatment program, the permittee will be notified in writing. The permittee shall immediately begin development of an industrial pretreatment program and shall submit it to the EPD for approval no later than one year after the notification.

3. During the interim period between determination that a program is needed and approval of the program, all industrial pretreatment permits shall be issued by the EPD.

4. The permittee shall notify the EPD of all industrial users connected to the system or proposing to connect to the system from the date of issuance of this permit.

5. Implementation of the Pretreatment Program developed by the State can be delegated to the permittee following the fulfillment of requirements detailed in 391-3-6-.09 of the Rules and Regulations for Water Quality Control.
Barrow County, Georgia

Tanner’s Bridge
Wastewater Treatment Facility
1.0 MGD Mechanical Plant
NPDES GA0039314
Oconee River Basin

Amendment to
Tanners Bridge Qualifluent
5.0 MGD Water Reclamation Facility
Design Development Report (October 2008)

September 2018
UPDATED January 2019

Submitted by:

EMI Engineering Management
303 Swanson Drive • Lawrenceville, Georgia 30043
770.962.1387 (ph) • 770.962.8010 (fx) • www.eminc.biz
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EXHIBITS
Exhibit A: EPD Issued Waste Load Allocation
Exhibit B: Map and Layout of Facility
Exhibit C: Mechanical Screen Information
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Exhibit L: Sludge Dewatering Calculation
Exhibit M: Calculations for Phase 3 SBRs conversion to Clarifiers

APPENDIX
Appendix A: Barrow County Tanner’s Bridge Qualifluent 5.0 MGD Design Development Report
I. INTRODUCTION AND INTENT

Barrow County currently operates a wastewater spray irrigation Land Application System (LAS) at its Tanner’s Bridge facility located at 1113 Briscoe Mill Road in Bethlehem, Georgia. This LAS system is operated under permit number GAJ020271 and is permitted to irrigate up to 0.50 MGD on 58.4 acres.

Currently the LAS system receives approximately 0.275 MGD of wastewater or 55% of its capacity.

In 2005 Barrow County began planning for a new 5.0 MGD activated sludge treatment facility at the Tanner’s Bridge location. A waste load allocation was approved in 2006 to discharge treated effluent into the Apalachee River. Subsequently, an Antidegradation Analysis, Environmental Information Document (EID) and Design Development Report (DDR) were submitted to EPD in 2009 and approved in 2010. Following approval of these documents an NPDES permit was issued as NPDES permit GA0039314. Due to the economic recession work on the project was halted in 2010.

With the improving economy, Barrow County is receiving an increasing number of requests for wastewater service from potential commercial and residential customers. Due to this recent growth, it is projected that the existing LAS system will not provide adequate treatment capacity for the future. Therefore, Barrow County is resurrecting plans to construct an activated sludge treatment facility at Tanner’s Bridge. However, due to the anticipated cost of a 5.0 MGD facility, the County is now proposing to construct the facility in three phases of 1.0 MGD, 2.0 MGD and the previously planned 5.0 MGD.

The 1.0 MGD and 2.0 MGD phases of the facility will utilize sequencing batch reactor (SBR) technology. The 3rd phase will utilize the activated sludge vertical loop reactor technology previously described in the Barrow County Tanner’s Bridge Qualifluent 5.0 MGD Design Development Report approved by EPD in 2010. A copy of this 5.0 MGD DDR is included in Appendix A.

This DDR serves as an amendment to the above mentioned 5.0 MGD DDR and provides discussion and design information for phases 1 (1.0 MGD) and 2 (2.0 MGD).

Barrow County also plans to keep the existing LAS system in service after the mechanical plant construction is completed.
II. FACILITY BACKGROUND

The primary wastewater service area for the Tanners Bridge WWTF wastewater treatment facility (WWTF) is located in the southwestern portion of Barrow County. The County has another WWTF facility, the Barber Creek WWTF, located on the eastern side of the County.

The current Tanners Bridge facility utilizes a wastewater spray irrigation Land Application System (LAS). This LAS system is operated under permit number GAJ020271 and is permitted to irrigate up to 0.50 MGD on 58.4 acres. This LAS facility will continue to be operated by the County during Phase 1 and Phase 2, and will be decommissioned with the 5.0 MGD Phase 3 upgrade.

Water is supplied to the existing plant by the City of Winder’s water system.

Barrow County is located in the Piedmont Geologic Providence approximately 50 miles northeast of Atlanta. The Tanners Bridge WWTF is located at 1113 Briscoe Mill Road in Bethlehem, Georgia. A location map of this facility is provided in Figure 1. The relative position of Barrow County within the State is presented on Figure 2.

Figure 1. Location of Tanners Bridge Wastewater Treatment Facility
III. EXISTING PERMIT AND WASTELOAD ALLOCATION

As previously stated, the existing 0.5 MGD LAS system, which is operated under permit number GAJ020271, will continue to be operated with the proposed 1.0 MGD and 2.0 MGD mechanical plant upgrades.

A wasteload allocation (Permit No. GA0039314) was granted on August 13, 2018 for several discharges limits. The parameters of these limits are listed in Table 1. A copy of the wasteload allocation is provided in Exhibit A.
Table 1. Wasteload Allocation Parameters for Tanners Bridge WWTF

<table>
<thead>
<tr>
<th>Constituent / Parameter</th>
<th>Permit Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effluent Flow Rate (MGD)</td>
<td>1.0 2.0 5.0</td>
</tr>
<tr>
<td>5-Day Biochemical Oxygen Demand (mg/L)</td>
<td>10 10 10</td>
</tr>
<tr>
<td>Total Suspended Solids (mg/L)</td>
<td>20 20 20</td>
</tr>
<tr>
<td>Ammonia, as N (mg/L)</td>
<td>5.0 3.0 1.7</td>
</tr>
<tr>
<td>Dissolved Oxygen, minimum (mg/L)</td>
<td>5.0 5.0 5.0</td>
</tr>
<tr>
<td>Fecal Coliform Bacteria (#/100mL)</td>
<td>200 200 200</td>
</tr>
<tr>
<td>Total Phosphorus, as P (mg/L)</td>
<td>1.0 1.0 1.0</td>
</tr>
<tr>
<td>Ortho-Phosphate, as P (mg/L)</td>
<td>Monitor Monitor Monitor</td>
</tr>
<tr>
<td>Total Kjeldahl Nitrogen (mg/L)</td>
<td>Monitor Monitor Monitor</td>
</tr>
<tr>
<td>Organic Nitrogen, as N (mg/L)</td>
<td>Monitor Monitor Monitor</td>
</tr>
<tr>
<td>Nitrate-Nitrite, as N (mg/L)</td>
<td>Monitor Monitor Monitor</td>
</tr>
</tbody>
</table>

This DDR provides discussion and design information for phases 1 (1.0 MGD) and 2 (2.0 MGD).

IV. DESIGN WASTEWATER CHARACTERISTICS AND FLOW

Currently, the average effluent flow for the WWTF is approximately 300,000 gpd. Effluent flow from the Discharge Monitoring Reports (DMRs) from June 2017 through May 2018 are provided in Figure 3.

Figure 3. Tanners Bridge WWTF Effluent Flow

The existing LAS Permit requires grab samples for influent BOD and TSS at the plant. From June 2017 through May 2018, the average influent BOD was 307 mg/L and the average influent TSS was 316 mg/l. In October 2017, both the BOD and TSS peaked at
654 mg/L BOD and 712 mg/L TSS. Figures 4 and 5 show the influent BOD and TSS average levels for each month.

**Figure 4. Tanners Bridge WWTF Influent BOD**

**Figure 5. Tanners Bridge WWTF Influent TSS**
Influent phosphorus and ammonia data were developed through five 8-hr composite samples of the influent flow. The results are provided in the table below.

<table>
<thead>
<tr>
<th>Date</th>
<th>Influent Phosphorus, mg/L</th>
<th>Influent Ammonia, mg/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>7/9/2018</td>
<td>7.74</td>
<td>36.6</td>
</tr>
<tr>
<td>7/12/2018</td>
<td>9.02</td>
<td>35</td>
</tr>
<tr>
<td>7/16/2018</td>
<td>7.61</td>
<td>33.6</td>
</tr>
<tr>
<td>7/20/2018</td>
<td>8.05</td>
<td>40.1</td>
</tr>
<tr>
<td>7/24/2018</td>
<td>7.06</td>
<td>32.1</td>
</tr>
<tr>
<td>Average</td>
<td>7.90</td>
<td>35.48</td>
</tr>
</tbody>
</table>

Influent alkalinity was tested in 2007, during the development of the 5.0 MGD DDR, with the following results. Additional alkalinity will be required therefore, equipment to feed magnesium hydroxide will be provided.

<table>
<thead>
<tr>
<th>Date</th>
<th>Influent Alkalinity</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/29/2007</td>
<td>96 mg/L</td>
</tr>
<tr>
<td>4/5/2007</td>
<td>100 mg/L</td>
</tr>
<tr>
<td>4/12/2007</td>
<td>200 mg/l</td>
</tr>
<tr>
<td>4/19/2007</td>
<td>212 mg/l</td>
</tr>
<tr>
<td>Average</td>
<td>152 mg/L</td>
</tr>
</tbody>
</table>

The Tanners Bridge Mechanical Plant will receive the same influent wastewater as the existing LAS system. Table 2 provides the proposed influent wastewater characteristic design constraints for the proposed plant.

**Table 2. Influent Wastewater Design Characteristics for Tanners Bridge WWTF**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Influent Wastewater</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 1 Flow</td>
<td>1.0 MGD / 2.5 MGD Peak</td>
</tr>
<tr>
<td>Phase 2 Flow</td>
<td>2.0 MGD / 5.0 MGD Peak</td>
</tr>
<tr>
<td>Influent BOD</td>
<td>350 mg/L</td>
</tr>
<tr>
<td>Influent TSS</td>
<td>350 mg/L</td>
</tr>
<tr>
<td>Influent Phosphorus</td>
<td>8.0 mg/L</td>
</tr>
<tr>
<td>Influent Ammonia, as N</td>
<td>35.0 mg/L</td>
</tr>
<tr>
<td>Influent Alkalinity</td>
<td>150 mg/L</td>
</tr>
</tbody>
</table>

**V. PROPOSED IMPROVEMENTS**

The design of the proposed Tanners Bridge Mechanical plant will be completed in accordance with the Georgia Environmental Protection Division (EPD) wasteload allocation that was issued for this facility, which is provided in Exhibit A.
As mentioned previously, the 1.0 MGD and 2.0 MGD phases of the facility will utilize sequencing batch reactor (SBR) technology. The 3rd phase will utilize the activated sludge vertical loop reactor technology previously described in the Barrow County Tanner’s Bridge Qualifluent 5.0 MGD Design Development Report approved by EPD in 2010. A copy of this 5.0 MGD DDR is included in Appendix A. Many of the components within Phase 1 will be designed for Phase 2 capacity. Some of the proposed Phase 1 and Phase 2 units can be utilized in the Phase 3 (5.0 MGD) Expansion. Table 3 provides a list of proposed treatment units with design capacities for phases 1, 2 and 3. Figure 6 provides a process diagram of the proposed mechanical plant for phase 1 and 2. A map of the proposed facility layout is provided in Exhibit B.

### Table 3. Proposed Treatment Units and Design Capacities for Phases 1, 2, and 3 for the Proposed Tanners Bridge WWTF

<table>
<thead>
<tr>
<th></th>
<th>Phase 1</th>
<th>Phase 2</th>
<th>Phase 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headworks – Mechanical Screen, grit removal, influent flow monitoring</td>
<td>2.0 MGD / 5.0 MGD Peak</td>
<td>No upgrade</td>
<td>5.0 MGD / 12.5 Peak Duplicate headworks</td>
</tr>
<tr>
<td>Influent Pump Stations</td>
<td>5.0 MGD Peak</td>
<td>No upgrade</td>
<td>5.0 MGD / 12.5 Peak Replace pumps</td>
</tr>
<tr>
<td>Sequential Batch Reactor (SBR)</td>
<td>2 Basins – 1.0 MGD / 2.5 Peak</td>
<td>4 Basins – 2.0 MGD / 5.0 Peak</td>
<td>Convert to clarifiers</td>
</tr>
<tr>
<td>Vertical Loop Reactors</td>
<td></td>
<td></td>
<td>5.0 MGD / 12.5 Peak</td>
</tr>
<tr>
<td>Equalization Basin</td>
<td>2.0 MGD / 5.0 Peak</td>
<td>No upgrade</td>
<td>Convert to Digester</td>
</tr>
<tr>
<td>Digester</td>
<td>1.0 MGD</td>
<td>2.0 MGD</td>
<td>5.0 MGD EQ converted to digester</td>
</tr>
<tr>
<td>Sludge Dewatering</td>
<td>2.0 MGD</td>
<td>No upgrade</td>
<td>5.0 MGD Replace or add belt press</td>
</tr>
<tr>
<td>Disinfection, Chlorine Contact Chamber</td>
<td>1.0 MGD / 2.0 Peak Duplicate chamber, 2.0 MGD / 4.0 Peak</td>
<td></td>
<td>Abandon</td>
</tr>
<tr>
<td>Ultra Violet Light Disinfection</td>
<td></td>
<td></td>
<td>5.0 MGD / 12.5 Peak</td>
</tr>
<tr>
<td>Effluent Pump Station</td>
<td>4.0 MGD</td>
<td>No upgrade</td>
<td>5.0 MGD / 12.5 Peak</td>
</tr>
<tr>
<td>Effluent Flow Monitoring</td>
<td>5.0 MGD</td>
<td>No Upgrade</td>
<td>No Upgrade</td>
</tr>
<tr>
<td>Step Aeration</td>
<td>5.0 MGD</td>
<td>No Upgrade</td>
<td>No Upgrade</td>
</tr>
</tbody>
</table>
Figure 6. Process Diagram for Phases 1 & 2 of the Proposed Tanners Bridge WWTF
A. Influent Flow Control Splitter Box
Currently, there are two forcemains that pump influent wastewater to the Tanners Bridge LAS. These forcemains will be intercepted and wastewater will flow into a flow control splitter box, where operators can control influent flow to either 1) a pump station that will pump the wastewater to the existing LAS, or 2) the mechanical plant headworks.

B. LAS Influent Pump Station
The LAS influent pump station will be designed to handle 0.5 MGD with a peak flow of 1.25 MGD. This station will be a duplex pump station with pumps rated at 870 GPM.

C. Mechanical Screen
The proposed headworks structure will include mechanical screening, manual bypass screen, grit removal equipment, and flow monitoring. The headwork components will be designed to handle 2.0 MGD with peak flows of 5.0 MGD in order to meet the Phase 2 expansion.

The new headworks will contain a mechanical auger-style cylindrical bar screen. The unit will be capable of treating a peak design flow of at least 5.0 MGD. The screen openings will be ¼ inch. The motor will be at a minimum of 2.0-hp. As an alternate, a by-pass manual bar screen can be utilized and the proposed mechanical screening and grit unit can be bypassed. An automatic bagger unit will be included to collect the screenings and discharge into a 4-yard dumpster.

Information on one of the potential mechanical screen units is provided in Exhibit C. No upgrades will be required for expansion to Phase 2 for the 2.0 MGD plant expansion. The influent headworks will be duplicated for expansion to Phase 3 for the 5.0 MGD plant expansion.

D. Grit Removal Equipment
The new headworks will also contain a vortex-style grit separator unit with classifier. The grit separator will have at a minimum a maximum hydraulic capacity of 5.0 MGD. The grit chamber drive will have a 1.0-hp motor. The classifier will have a feed rate of 25 gpm, and conveying capacity of 30 cf/hr.

The equipment will be able to remove 95% of >50 mesh grit, 85% of >70 mesh grit, and 65% of >100 mesh grit.

Information on one of the potential grit separator unit is provided in Exhibit D. No upgrades will be required for expansion to Phase 2 for the 2.0 MGD plant expansion. The influent headworks will be duplicated for expansion to Phase 3 for the 5.0 MGD plant expansion.

E. Influent Flow Monitoring
Influent flow monitoring will be designed to handle 2.0 MGD with a peak flow of 5.0 MGD. A Parshall flume with a 12-inch throat width (54 GPM to 7,240 GPM) will be placed downstream of the grit removal equipment for influent flow metering. No
upgrades will be required for expansion to Phase 2 for the 2.0 MGD plant expansion. The influent flow monitoring will be duplicated with the expanded headworks for expansion to Phase 3 for the 5.0 MGD plant expansion.

F. Influent Pump Station
Downstream of the parshall flume, the wastewater will flow into a pump station that will pump the wastewater to the SBRs. The mechanical plant influent pump station will be designed to handle 2.0 MGD with a peak flow of 5.0 MGD. This station will be a triplex pump station with all pumps rated at 2,000 GPM. No upgrades will be required for expansion to Phase 2 for the 2.0 MGD plant expansion. The pumps in the influent pump station will need to be replaced with larger pumps for expansion to Phase 3 for the 5.0 MGD plant expansion.

G. Sequential Batch Reactors
Sequencing batch reactor (SBR) technology has been chosen for the treatment system. Barrow County staff operate another facility in eastern Barrow County; the Barber Creek wastewater treatment facility also treats wastewater through SBR technology and therefore staff are familiar with operating this type of facility. A design report is included as Exhibit E, and summarized below.

For Phase I, the design includes two 73-ft diameter round basins. Minimum and maximum water depths are 13.0 feet, and 21 feet, respectively. A treatment cycle will take 4.8 hours, resulting in 5 cycles per day per basin. The solids retention time is 12.6 days. The average decant rate is 3,472 gpm. The Phase II design is identical to that of Phase I. Further details of the Phase I and II designs can be found in Exhibit E.

Mixing in each of the SBR will be delivered through a 15-HP Aqua-Aerobic Systems Endura Series Model FSS DDM Direct Drive Mixer per SBR. Aeration in each SBR will be provided through 6 retrievable fine bubble diffuser assemblies with 25 diffuser tubes. Three Aerzen 60HP rotary positive displacement blowers, will provide aeration to the fine bubble diffusers for both SBRs.

Phase I SBR’s will operate in unison. While one reactor is filling, the other will be reacting, decanting, wasting sludge, or idling. Treated wastewater will be directed by gravity from the SBR’s to an equalization basin. Phase II SBR’s will work in sequence. The equalization basin will also be utilized in Phase II.

The Phase 3 upgrade will utilize vertical loop reactors, as explained in the 5.0 MGD DDR provided in Appendix A. Phase 3 will not utilize SBR technology for wastewater treatment. The four SBRs will be converted to clarifiers. Calculation on the clarifiers is provided in Exhibit M.

H. Alkalinity Addition
If necessary, alkalinity will be added to maintain a residual of at least 50 mg/L. Based on an average influent alkalinity of 150 mg/L as CaCO₃, additional alkalinity will likely be required for BOD removal and nitrification. Magnesium hydroxide (Mg(OH)₂) slurry
will be utilized for alkalinity addition. It is estimated that 49 gpd will be required for 1 MGD, and 98 gpd will be required for 2 MGD.

Initially, the facility will not operate at design capacity and currently the average influent flow into the LAS is 0.3 MGD. A 330-gallon tote will be provided at the facility which will provide 23 days of storage. Additional room at the chemical storage building will be provided for a 2,000-gallon tank as the influent flow into the plant increases. The 2,000-gallon tank will provide 40 days of storage for Phase 1 and 20 days of storage for Phase 2. Calculations are provided in Exhibit F.

I. Phosphorus Removal
Some phosphorus removal will be provided by biological treatment. However, Polyaluminum Chloride (PACl) will be added to the SBR’s in order to meet the effluent phosphorus limit of 1 mg/L. The PACl dosage was based on an average daily flow of 1.0 MGD, with influent phosphorus and BOD levels of 8 mg/l, and 300 mg/l. The PACl dosage at 1.0 MGD is 804 lb/day or 81 gal/day. There will be one 5,000-gallon fiberglass storage tank for polyaluminum storage. Since the estimated PACl dosage will be 81 gpd at 1.0 MGD and 162 gpd at 2.0 MGD, the storage tank will have a storage capacity of 61.7 days for Phase 1 and 30.8 days for Phase 2. There will be two 1/3 hp motor driven metering pumps for the PACl, (one for backup), that will be sized for 240 gal/hour at 45 psi, with 0-100% operable capacity. Calculations for polyaluminum chloride dosage and storage are provided in Exhibit G.

J. Post Equalization Basin
Post-equalization from the SBR’s will help regulate flow into the chlorine contact chambers. The decant rate from the SBR’s is greater than average daily flows throughout the plant. The post- EQ requirements for phase 1 determine the sizing of the post-EQ basin.

Average decant flow from the SBR at phase 1 is 3,472 gpm, for 72 minutes, according to the SBR design report provided in Exhibit E. The chlorine contact chamber will be designed to handle 2.0 MGD peak flow (1,389 gpm) and the time between decants is 144 minutes. Therefore, the minimum required volume of the post-EQ basin is 20,051 cubic feet. The dimension of the proposed basin is 50-ft diameter, with 17.0-ft water depth, for a total volume of 33,379 cubic feet (149,678 gallons), or approximately one decantable volume. Therefore, the proposed post-EQ basin is adequately sized.

In order to prevent surcharging in the SBRs, the high-water level of the EQ basin shall be at least 3-feet lower than the minimum water level in the SBRs. For a HWL of 17-ft in the EQ basin and minimum water depth of 13-ft in the SBRs, the slab on the EQ basin shall be constructed at an elevation 7-ft lower than the slab of the SBRs.

The Phase 3 upgrade will utilize vertical loop reactors, as explained in the 5.0 MGD DDR provided in Appendix A. Phase 3 will not utilize SBR technology for wastewater treatment, and the post EQ basin will not be utilized. The post EQ basin will be converted to a digester.
Calculations for post-EQ basin are provided in Exhibit H.

K. Disinfection
Disinfection will be achieved through chlorination in a chlorine contact chamber. Typical design parameter recommendations include a chlorine minimum retention time of 30 minutes for average flow and minimum retention time of 15 minutes during peak flow.

Phase 1 will include two chlorine contact chamber basins, which will be sized to provide a minimum contact time of 15 minutes at a peak flow of 2.0 MGD with one chamber down. During phase 1, wastewater will flow from the post-EQ basin at a maximum flow of 2.0 MGD.

Phase 2 will include duplication of Phase 1, with 4 chlorine contact chamber basins, and will be sized to provide a minimum contact time of 30 minutes with all chambers or a minimum contact time of 15 minutes at with one chamber down, at a peak flow of 4.0 MGD.

The proposed dimensions of each chlorine contact chamber basin will be a 530 ft² footprint at 7-ft water depth. The proposed total volume for two chlorine contact chamber basins for Phase 1 will be 55,502 gallons, for a detention time of 20 minutes during peak flows with one unit down, and a detention time of 40 minutes during peak flow rates.

For Phase 2, the proposed total volume for four chlorine contact chamber basins will be 111,003 gallons. The detention time at the average decant rate at maximum daily flow with one unit out of service will be 30 minutes, and the detention time at the average decant rate will be 40 minutes.

Chlorine dosage at 6 mg/l for 1 MGD would require 48 gpd of 12.5% solution liquid sodium hypochlorite, and 96 gpd at 2.0 MGD. Initially, the facility will not operate at design capacity and currently the average influent flow into the LAS is 0.3 MGD. A 330-gallon tote will be provided at the facility which will provide 23 days of storage. Additional room at the chemical storage building will be provided for a 2,000-gallon tank as the influent flow into the plant increases. The 2,000-gallon tank will provide 40 days of storage for Phase 1 and 20 days of storage for Phase 2. Calculations are provided in Exhibit I.

The Phase 3 upgrade will include ultra violet light technology for disinfection; therefore, the chlorine contact chambers will be abandoned for the phase 3 upgrade.

L. Dechlorination
Although the wasteload allocation does not specify total residual chlorine limits, facilities for dechlorination will be provided. The proposed dechlorination system will utilize a liquid feed system, using sodium bisulfite as the dechlorinating agent.
The assumed total residual chlorine (TRC) value is 1 mg/L. According to AWWA, it takes 1.2 lb sodium bisulfite per 100,000 gal of water to neutralize 1 mg/L of chlorine. The proposed solution of sodium bisulfite has 40% available sodium bisulfite. The calculated dosage rate for Phase 1 is 3.6 gpd of liquid sodium bisulfate, with a maximum dosage rate of 7.2 gpd. The calculated dosage rate for Phase 2 is 7.2 gpd of liquid sodium bisulfate, with a maximum dosage rate of 14.4 gpd.

Operators specify that the feed rate of sodium bisulfite is often the same as the feed rate of sodium hypochlorite; therefore, a chemical pump will be selected with an operating flow rate similar to that of the liquid sodium hypochlorite chemical feed pump. The calculations for dechlorination are provided in Exhibit I.

Similar to the chemical storage for liquid sodium hypochlorite, a 330-gallon tote will be provided at the facility for liquid sodium bisulfate, which will provide 23 days of storage. Additional room at the chemical storage building will be provided for a 2,000-gallon tank as the influent flow into the plant increases. The 2,000-gallon tank will provide 40 days of storage for Phase 1 and 20 days of storage for Phase 2. Calculations are provided in Exhibit I.

The Phase 3 upgrade will include ultra violet light technology for disinfection; therefore, chlorination and dechlorination will not be utilized for the phase 3 upgrade.

M. Effluent Flow Measurement
The effluent from the chlorine contact chamber will flow into the an 18-inch Parshall flume, capable of measuring from 112,400 gpd to 15.83 MGD (78 GPM to 11,020 GPM), located upstream of effluent pump station. No upgrades will be required for expansion to Phase 2 for the 2.0 MGD plant expansion, or the for expansion to Phase 3 for the 5.0 MGD plant expansion.

N. Effluent Pump Station
Treated wastewater will flow from the parshall flume to the effluent pump station, to be pumped to the off-site discharge location, specified in the wasteload allocation issued by EPD. The effluent pump station will be designed to handle 2.0 MGD with a peak flow of 4.0 MGD. This station will be a triplex pump station with all pumps rated at 1,600 GPM. No upgrades will be required for expansion to Phase 2 for the 2.0 MGD plant expansion.

The pumps in the effluent pump station will need to be replaced with larger pumps for expansion to Phase 3 for the 5.0 MGD plant expansion.

O. Cascade Step Aeration
Step aeration will be used before discharge to boost dissolved oxygen concentrations which might have been reduced during disinfection. A total falling height of 6.4 feet is required to ensure a dissolved oxygen concentration of 5 mg/L in the effluent. There will be eight (8) 10” steps with a channel width of 10-ft for a total fall of 6.67 ft. The steps will have treads of 12-24 inches. The top of the step aeration structure will be higher than the 100-year flood elevation. Exhibit J provides a basis for design.
The 5.0 MGD DDR does not address post-treatment aeration. The cascade step aeration can be utilized in the Phase 3 expansion.

P. Sludge Digestion
Sludge generated by the reactors will be stabilized by aerobic digestion. Waste sludge from the SBR basins will be pumped to the digester(s). One digester is proposed for Phase 1 and a second digester of the same size is proposed for Phase 2. As explained previously, the post EQ basin will be converted to a digester for Phase 3, creating three digesters.

The 50-ft diameter digesters will have a maximum depth of 21-ft, for a total volume of 308,467 gallons (per digester). The detention time will be 22.4 days. An additional sludge digester will be built during Phase II, with a maximum total volume of 616,934 gallons, and a detention time of 18.96 days. Each digester will be equipped with two retrievable coarse bubble diffusers with five tubes for each diffuser. A 50-HP positive displacement blower will supply air to the diffusers. Calculations are provided in Exhibits E and K.

Q. Sludge Dewatering
A Charter Machine Company Belt Filter Press Model TP17.43, with a width of 1.5 meters will be selected for sludge dewater for phases 1 and 2. The belt filter press is capable of handling 170 gpm of aerobically digested sludge. For an operating time of 6 hours per day (considering startup and shut-down time), the press would need to be run 2 days per week at maximum flow for phase 1 and 4 days per week for phase 2. The sludge dewatering equipment with either need to be upgrade to a larger unit or additional dewatering equipment will need to be added for expansion to Phase 3 for the 5.0 MGD plant expansion.

Water from the press will flow by gravity to the influent wet well. Dewatered sludge will be hauled to the Oak Grove Landfill in Winder. Exhibit L contains design calculations and information for the belt filter press.

R. Support System
Buildings.
The proposed facility will have an operation control building that houses office space, lab space, the electrical motor control center room, and storage. A chemical feed building with separated rooms will house the chlorination, dechlorination, alkalinity, and polyaluminum chloride equipment. Another building will house the belt filter press. Bulk chemical storage will be held in a covered shed. Blowers will be housed in a sound-attenuating enclosure. All of the buildings will be located on existing Barrow County Tanners Bridge WWTF property.

Electrical System. The current power supplier at the LAS site is Walton EMC. The proposed mechanical plant will also be supplied power by Walton EMC. A standby generator will be supplied to operate the critical components of the treatment facility in case of local utility power failure. The capacity of the generator will be determined in the
design phase. The critical components of the facility include the influent pump station, blowers, instrumentation and controls, the chlorination system, and effluent pump station.

**Instrumentation and Controls.** Instrumentation and controls are specified in each of the process design reports, included as Exhibit E. These controls will be integrated into the proposed system in the control building.

**Water System.** Water is supplied to the existing plant by the City of Winder water system.

**S. Site Requirements**

The existing Tanners Bridge LAS is located on a 204.5-acre parcel, with approximately 58.4 acres utilized for the LAS ponds and spray fields. The proposed mechanical plant will be located on the 103-acre adjacent parcel, and will utilize approximately 15 acres.

**VI. Conclusion**

Barrow County currently operates a wastewater spray irrigation Land Application System (LAS) at its Tanner’s Bridge facility under permit number GAJ020271 and is permitted to irrigate up to 0.50 MGD on 58.4 acres. Currently the LAS system receives approximately 0.275 MGD of wastewater or 55% of its capacity.

A wasteload allocation (Permit No. GA0039314) to discharge treated effluent into the Apalachee River was granted on August 13, 2018 for several discharges limits, including 1.0MGD, 2.0 MGD, and 5.0MGD.

A DDR for a new 5.0 MGD activated sludge treatment facility at the Tanner’s Bridge location was approved by EPD in 2010. However, due to the anticipated cost of a 5.0 MGD facility, the County is now proposing to construct the facility in three phases of 1.0 MGD, 2.0 MGD and the previously planned 5.0 MGD. Barrow County also plans to keep the existing LAS system in service after the mechanical plant construction is completed.

This DDR serves as an amendment to the approved 5.0 MGD DDR and provides discussion and design information for phases 1 (1.0 MGD) and 2 (2.0 MGD). Upon approval of this DDR by EPD, the County will begin a design-build construction of the proposed Phase 1 improvements.
Exhibit A:
EPD Issued Waste Load Allocation
August 13, 2018

Honorable Pat Graham, Chairman
Barrow County Board of Commissioners
30 North Broad Street
Winder, GA 30680

RE: Tanners Bridge WPCP
NPDES Permit No. – GA0039314
Wasteload Allocation Request
Phased Discharge up to 5.0 MGD
EPD # 2018-096
Barrow County

Honorable Chairman Graham:

The Watershed Planning and Monitoring Program (WPMP) has completed the evaluation of the wasteload allocation request for a new year-round discharge of 0.75 MGD, 1.0 MGD, 1.5 MGD, 2.0 MGD, and 5.0 MGD of treated domestic wastewater associated with the Tanners Bridge WPCP (GA0039314) into the Apalachee River in the Oconee River Basin.

The wasteload allocation is valid for one year from the date of this letter unless a written extension is requested and granted. This wasteload is provided for planning purposes only.

<table>
<thead>
<tr>
<th>Constituent/Parameter (1)</th>
<th>Permit Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effluent Flow Rate (MGD)</td>
<td>0.75 1.0 1.5 2.0 5.0</td>
</tr>
<tr>
<td>Five-Day Biochemical Oxygen Demand (mg/L)</td>
<td>10 10 10 10 10</td>
</tr>
<tr>
<td>Total Suspended Solids (mg/L)</td>
<td>20 20 20 20 20</td>
</tr>
<tr>
<td>Ammonia, as N (mg/L)</td>
<td>5.0 5.0 3.7 3.0 1.7</td>
</tr>
<tr>
<td>Dissolved Oxygen, Minimum (mg/L)</td>
<td>5.0 5.0 5.0 5.0 5.0</td>
</tr>
<tr>
<td>Fecal Coliform Bacteria (#/100mL)</td>
<td>200 200 200 200 200</td>
</tr>
<tr>
<td>pH, Minimum – Maximum (S.U.)</td>
<td>6.0 – 9.0 6.0 – 9.0 6.0 – 9.0 6.0 – 9.0 6.0 – 8.5</td>
</tr>
<tr>
<td>Total Phosphorus, as P (mg/L) (2)</td>
<td>1.0 1.0 1.0 1.0 1.0</td>
</tr>
</tbody>
</table>
(Table continued below)

<table>
<thead>
<tr>
<th>Constituent/Parameter(^{(1)})</th>
<th>Permit Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ortho-Phosphate, as P (mg/L)</td>
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</tr>
<tr>
<td>Total Kjeldahl Nitrogen (mg/L)</td>
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<tr>
<td>Organic Nitrogen, as N (mg/L)</td>
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<tr>
<td>Nitrate-Nitrite, as N (mg/L)</td>
<td>Monitor Monitor Monitor Monitor Monitor</td>
</tr>
</tbody>
</table>

\(^{(1)}\) Values are maximum monthly averages except as noted
\(^{(2)}\) Lake standards are being established for Lakes Oconee and Sinclair. It is anticipated that a TP limit of 0.5 mg/L will be needed to meet the lake criteria.

If you should have any questions, please do not hesitate to contact me at 404-463-1834 or Josh.Hayes@dnr.ga.gov.

Sincerely,

Josh Hayes  
Municipal Permitting Unit  
Wastewater Regulatory Program

Cc: Mr. Chip McGaughey, P.E. – EMI Engineering Management, chipm@eminc.biz
Exhibit B:
Map and Layout of Facility
Exhibit C:
Mechanical Screen Information
Budgetary Proposal
August 2, 2018

TO
Chip McLaughhey, P.E.
Engineering Management, Inc.
303 Swanson Drive
Lawrenceville, GA 30043

PROJECT
Barrow County, Georgia
Tanner's Bride Headworks

EQUIPMENT

Lakeside Raptor® Fine Screen
Model 47FS - 0.25 - 173

<table>
<thead>
<tr>
<th>UNIT</th>
<th>QTY</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>$146,000</td>
<td>1</td>
<td>$146,000</td>
</tr>
</tbody>
</table>

Due to the current volatility of stainless steel prices, budgetary cost of equipment may be subject to change.

SPECIFICATION

<table>
<thead>
<tr>
<th>UNIT</th>
<th>QTY</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>$146,000</td>
<td>1</td>
<td>$146,000</td>
</tr>
</tbody>
</table>

| Unit Capacity: | Maximum Headloss: |
| 6.85 mgd | 13 inches |

| Inclination: | Maximum Upstream Level: |
| 35 degrees | 23 inches |

| Bar Spacing: | Nominal Basket Diameter: |
| 1/4 inch | 47 inches |

| Water Requirements: | Transport Screw Diameter: |
| 20 gpm at 60 psi | 10 inches |

SCREEN

AISI 304 stainless steel construction
Structural support with anchorage
3-plane cylindrical screenings basket
Rotating rake assembly with hinged cleaning comb
Screw conveyor with helical flights
2 hp drive unit
3-Zone wash system with solenoid valves
Two (2) float switches
Weather protection system
Screenings bagger - continuous type
Spare parts

CONTROL PANEL

Non-explosion proof design
NEMA 4X - 304 stainless steel main control panel
No local control station
Fusible disconnect switch with door handle
Control power transformer
Allen-Bradley MicroLogix 1100 PLC
Variable frequency drive with line reactor
Selector switches
Indicator lights

EXCLUSIONS

Grating across channel
Handrail around perimeter of channel
Screenings collection containers
Piping, valves or fittings, unless noted otherwise
Interconnecting conduit or wiring

OPTIONAL ITEMS

<table>
<thead>
<tr>
<th>UNIT PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extra screen transport tube length (per foot of extra vertical height)</td>
</tr>
<tr>
<td>Explosion proof design package</td>
</tr>
</tbody>
</table>

NOTES

| FOB: | Chariton, Iowa |
| Freight: | Freight allowed to jobsite |
| Start-Up Service: | 2 days in 1 trips |
| Warranty: | One (1) year |
| Approvals: | 6 to 8 weeks |
| Shipment after Approval: | 18 to 20 weeks |
| Weight per Screen: | 3,240 lbs |
| Installation Time per Screen: | 32 hours |
**RAPTOR® Fine Screen, Model 47FS-0.25**

Minimum channel width ........................................... 50 in.
Basket diameter ..................................................... 47 in.
Basket type ............................................................. Cylindrical 3-plane
Bar spacing ............................................................. 0.25 in.
Unit weight ............................................................. 3,240 lbs
Maximum hydraulic capacity .................................. 6.85 mgd
Maximum upstream water level ............................... 23.2 in.
Maximum headloss .................................................. 13.0 in.
Inclination ............................................................... 35°
Screw conveyor diameter ......................................... 10 in.
Screen material ........................................................
  Screen basket (AISI 304 stainless steel)
  Rotating rake arm (AISI 304 stainless steel)
  Transport tube (AISI 304 stainless steel)
  Screw (AISI 304 stainless steel)
Lower bearing .......................................................... Self-lubricated
Automatic wash system .............................................
  Basket wash
  Transport wash
  Compaction dewater wash
Water requirements ................................................ 20 gpm @ 60 psi
Solenoid valves (3) ..................................................... ¾ in. two-way
  Brass body, slow-closing

**Level Sensor:**

Sensor type ............................................................ Float
Brand ................................................................. Linden

**Motor:**

Rated Effect ............................................................ 2.0 HP
Rotations ............................................................... 1,800 rpm
Phase, Frequency, Voltage ...................................... 3 Ph / 60 Hz / 230-460 Volts
Frame ................................................................. 145TC
Enclosure .............................................................. TEFC
Efficiency .............................................................. Premium
Duty ................................................................. Severe
Classification ........................................................ Non-explosion proof
Gear Reducer:

Brand: Sumitomo SM-Helical
Type: Cycloidal/Helical gear
Ratio: 249:1
Stages: 2
Torque: 26,900 in-lbf
Thrust: 8,400 in-lbf
Service factor: 1.63

Service Interval/oil change: Every 6 months
Grade of oil: ISO 100 - 4EP
Quantity of oil: 0.34 gal.

Control Panel:

Enclosure: NEMA 4X (stainless steel)
Logic: Allen-Bradley MicroLogix 1100 PLC
External communication:
- Remote dry contact outputs for the following:
  - Screen running
  - Malfunction alarm
  - High water level alarm

Other components:
- Door interlocked fused disconnect
- VFD with line reactor
- Control power transformer
- 120 VAC transient voltage surge suppressor
- Cabinet heater with thermostat (outdoor installations)
- LED pilot lights for the following:
  - Control power on (white)
  - High level (amber)
  - Overload shutdown / screen fault (red)
- Hand-Off-Auto selector switches for the following:
  - Screen drive
  - Wash system
- Forward-Off-Reverse selector switch for screen drive
- Re-set push button (black)
- E-stop push button (red)
- Door-mounted elapsed time meter
- Weather protection system heat tracing circuit breaker
- Plant water heat tracing circuit breaker
- White phenolic nameplates with black lettering
- 600 VAC terminal block
- U.L. panel label
LAKESIDE SCREEN
GENERAL DESIGN NOTES

Follow these guidelines when incorporating a Lakeside screen in your project:

Hydraulics

1. Based upon the desired channel velocity, which is typically in the range of 1 to 3 ft/sec, you will need to determine the channel width upstream and downstream of the Lakeside Screen. The channel width may be less than that required to accommodate the Lakeside Screen basket.

2. If there is a transition from an influent feed pipe to an open channel, the maximum water level upstream of the screen should not flood the influent feed pipe. Lower the channel floor to ensure the water level does not exceed 75-percent of the inlet pipe diameter.

3. The Lakeside screen operates on a set water level upstream of the screen. Regardless of the flow rate, once the upstream water level reaches 2.0-inches below the screen’s maximum upstream water level, the level sensor will activate the screen for operation. The screen’s maximum upstream water level is shown on the screen layout drawing.

Installation Requirements

4. Include provisions to lift and/or rotate the screen out of the channel for service. Considerations might include: mobile lifting equipment, permanently installed hoists, overhead lifting beams or eye hooks. Accessibility, work space and convenience of use must also be considered.

5. Keep the area under the screenings transport screw free from fixed obstructions such as slide gates, electrical conduit, piping and other process equipment to allow pivoting the screen for service.

6. Installations that are subject to freezing conditions should be enclosed or have weather protective walls or covers over the basket area. This protection is necessary to prevent the buildup of ice from storms and wash water overspray.

7. Flexible electrical conduit runs with a drip leg between the screen and hard conduit are required to allow free rotation of the screen. The hard conduit should be terminated near the pivot point on the transport screw to minimize the length of flexible conduit.

8. Flexible hose runs or quick disconnect fittings in the wash water piping are required to permit rotation of the screen out of the channel.

9. Rapid closure of the wash water solenoid valves furnished on the Lakeside screen will generate a water hammer in the wash water piping. Installation of a water hammer eliminator is suggested to protect piping, backflow preventers or other connected equipment from the potentially damaging effects.
10. Provision for a screenings discharge container should be considered at design time. If standard size containers are available at an existing plant and will be used for the screen, check to insure the space between the operating floor and discharge hopper will accommodate the container. While containers come in many different sizes and shapes, generally a 1 cu yd container will have an overall height of approximately 42 in. If your project requires additional space, contact Lakeside for assistance in providing the correct screen for your application.

11. For tank-mounted screens:

   a. If the screen is used for septage hauling applications, the tank inlet must be sufficiently below the truck outlet to insure proper flow.

   b. Adequate supports should be furnished for any tank mounted inlet and outlet piping.

   c. Lakeside furnished tanks are not designed as pressure vessels. Adequate pressure and vacuum relief, by others, is required.

**Electrical Controls**

12. Surges in the plant power supply may damage electronic equipment in the control panel. Surge suppression is suggested where there is a history of utility upsets or when there is a regular test program of switching between utility power and emergency power systems.

13. The control panel must be located to avoid direct exposure to the sun. High solar heating can prevent proper operation of internal electronic equipment.

14. Separate conduit runs are required for high voltage power, control power and signal wiring.

15. Conduit runs must enter the bottom of the control panel and should be provided with moisture drains. Moisture from conduits entering at other locations can cause problems with sensitive electronic equipment. Water damage is not covered by Lakeside’s warranty.

Conduit entering the top of the panel will void the warranty.

**Stainless Steel and Rust**

16. The main body of the Lakeside Screen is constructed of stainless steel. Contact with ferrous materials will cause iron oxide (rust) to form on the surfaces. We suggest protecting all stainless surfaces during storage, handling, and installation to prevent the unsightly formation of rust. Some of the common causes are summarized below:

   a. Contact with carbon steel chain or cable.
   b. Wire brushes contaminated with iron.
   c. Grindings from nearby fabrication.
   d. Weld splatter from nearby fabrication.
   e. High iron content wash or process water.

DW
11/15/05
**Raptor® Fine Screen**

Stainless Steel Construction
Efficiently Removes Solids and Debris

**LAKESIDE EQUIPMENT CORPORATION**
Water Purification Since 1928

Cleaner Water for a Brighter Future®
Engineered for Superior Operation and Performance

The Lakeside Raptor® Fine Screen is an efficient, proven screening technology for removal of inorganic solids that can be harmful to downstream equipment in municipal and industrial wastewater applications. High removal efficiency and low headloss is achieved with the Raptor® Fine Screen's unique inclined cylindrical screenings basket design having varied screen bar heights. The Raptor® Fine Screen's rotating rake teeth fully penetrate the screen bars to positively remove captured debris and prevent grease from blinding or plugging the screenings basket, making the Raptor® Fine Screen ideal for septage receiving, sludge, scum and grease trap applications. The heavy-duty design provides durability and long life in the most severe conditions. Captured screenings are compacted, dewatered and washed free of most organics to approximately 40 percent solids. Volume is reduced by 50 percent and weight by 67 percent, thereby reducing disposal cost.

- All stainless steel construction resists corrosion
- Combines 4 processes in one unit (screens, washes compacts and dewater)
- Uniquely designed three plane screenings basket minimizes headloss
- Fully penetrating rake teeth prevent screen basket from plugging and blinding
- Dual spray wash system provides cleaner discharge screenings
- Integrated compaction zone reduces volume and weight for reduced disposal cost
- Enclosed transport tube and optional bagger attachment reduce odors

Made in the USA to our quality standards for performance you can trust.

Raptor® Fine Screen with Continuous Bagger

Raptor® Fine Screen with Hinged Access Cover

In-Channel Raptor® Fine Screen
Four Operations in One Unit
Screens, Washes, Compacts and Dewaters

Screen Operation
As wastewater flows through the screenings basket, solids are captured by the screen bars that form the unique 3-plane cylindrical basket.

When the upstream water level rises to a high level set point, the rake arm begins to rotate for removal of the captured material. After the rake arm makes a complete revolution, material falls into a collection trough. For complete cleaning, the rake arm reverses direction at the top of the screenings basket and passes through a hinged cleaning comb. The debris is removed from the collection trough by a central screw conveyor. The conveyed material travels up the inclined transport tube where the material is washed, compacted, and dewatered prior to being discharged into a debris container.

Raptor® Fine Screen with Weather Protection
- Hinged structural support allows unit to pivot out of channel for maintenance at floor level
- PLC-equipped control panel for versatile and efficient operation
- Simple drive assembly makes service easy and reduces maintenance costs
- All mating parts are machined to ensure proper fit and operation
- Unit is shipped fully assembled to minimize installation expenses
- Entire unit can be enclosed in a pre-engineered tank for additional protection
- Explosion-proof designs are available
- Optional weather protection system protects to 13°F below zero (minus 25°C)

Stainless steel construction for superior corrosion resistance.
Treatment equipment and process solutions from Lakeside Equipment Corporation

Lakeside offers a wide range of equipment and systems for virtually all stages of wastewater treatment from influent through final discharge. Each process and equipment item that we supply is manufactured with one goal: to reliably improve the quality of our water resources in the most cost-effective way. We have been doing just that since 1928.

**Screw Pumps**
- Open Screw Pumps
- Enclosed Screw Pumps

**Raptor® Screening**
- Fine Screen
- Micro Strainer
- Rotating Drum Screen
- Septage Acceptance Plant
- Septage Complete Plant
- Complete Plant
- Multi-Rake Bar Screen
- Wash Press

**Screen and Trash Rakes**
- Hydronic T Series
- Hydronic K Series
- Hydronic Multifunctional Series
- Hydronic H Series
- Catronic Series
- Monorail Series
- HY-TEC Screen
- CO-TEC Screen
- RO-TEC Screen

**Grit Collection**
- SpiraGrit
- Aeroductor
- In-Line Grit Collector
- Raptor® Grit Washer
- Grit Classifier
- H-PAC®

**Clarification and Filtration**
- Spiraflo Clarifier
- Spiravac Clarifier
- Full Surface Skimming
- MicroStar® Filter

**Biological Treatment**
- CLR Process
- Magna Rotor Aerators & Accessories
- Sequencing Batch Reactors
- Package Treatment Plants
- Submersible Mixers & Recirculation Pumps

**Hauled Waste Receiving Systems**
- Raptor® Septage Acceptance Plant
- Raptor® Septage Complete Plant

**Package Headworks Systems**
- Raptor® Complete Plant
- H-PAC®

**Biological Treatment Systems**
- CLR Process
- Package Treatment Plants
- Sequencing Batch Reactors
EMERGENCY BY-PASS GATE

MANUAL BAR SCREEN

BY OTHERS

REMOVABLE HANDRAIL

BY OTHERS

FLOAT SWITCHES

EMERGENCY BY-PASS CHANNEL

PROXIMITY SENSOR

BAGER ATTACHMENT

DEWATERING CHAMBER

SOLENOID VALVES

3 REQD.

TUBE HEATER

2-4 1/2"

2'-8"

5'-2"

SPRAY WASH SOLENOID VALVES

TRANSPORT TUBE HEATER

FLOAT SWITCHES

SCREEN DRIVE MOTOR

CONTROL PANEL

ELECTRICAL INTERCONNECTION DIAGRAM

ALL CONDUIT AND WIRE CONNECTIONS BETWEEN CONTROL PANEL AND FINE SCREEN COMPONENTS BY OTHERS

CONTRACTOR NOTES:

1) WATER SUPPLY LINES AND ELECTRICAL CONNECTIONS TO BE FLEXIBLE OR DISCONNECT TYPE TO ALLOW UNIT TO PIVOT OUT OF CHANNEL.

2) UNITS WITH OPTIONAL TUBE HEATER WILL REQUIRE A DEEPER CHANNEL OR ELEVATED CURBING AROUND LOWER END OF SCREEN TO ALLOW PLACEMENT OF CHECKERED PLATE OVER TOP OF CHANNEL.

3) FOR PROPER APPLICATION OF THIS PRODUCT REFER TO RMI-95, LAKESIDE SCREEN GENERAL DESIGN NOTES.

F.R.P. HINGED COVER

EMERGENCY BY-PASS GATE

TOP ELEV. 2" ABOVE MAX. W.L.

SECTION A-A

SECTION C-C
SECTION 11330 - 3-PLANE CYLINDRICAL BAR SCREEN

BARROW COUNTY, GEORGIA

PART 1 - GENERAL

1.01 SUMMARY

A. The CONTRACTOR shall furnish, install and place into satisfactory operating condition the number of 3-plane cylindrical bar screens noted in paragraph 1.03.C.1. The 3-plane cylindrical bar screen shall be designed for removing floating, particulate, or fibrous material and to transport washed and dewatered screenings to a collection container as shown on the Drawings and described in the Specifications.

B. It is the intent of these Specifications that all equipment called for under this Section shall be supplied by a single manufacturer.

C. Related Sections

1. General Conditions, Supplementary Conditions, and General Requirements sections apply to work of this Section.

1.02 REFERENCES

A. American Institute of Steel Construction (AISC)

B. American Society of Testing and Materials (ASTM)

C. American Welding Society (AWS)

D. National Electrical Manufacturers Association (NEMA)

E. Steel Structures Painting Council (SSPC)

1.03 SYSTEM DESCRIPTION

A. Each 3-plane cylindrical bar screen unit shall consist of a screen basket, rotating rake, cleaning comb, concentric screw conveyor, dewatering and compaction section, drive assembly, pivoting support structure, screenings bagger attachment, weather protection system and spare parts.
B. The screen shall be complete with electrical control panel and level sensing system. Systems for this project, other than 3-plane cylindrical bar screens with integral screening, screenings washing, transport, and compaction/dewatering using a single motor drive system, will not be considered.

C. Design Summary

<table>
<thead>
<tr>
<th>Number</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Screens</td>
<td>1</td>
</tr>
<tr>
<td>Average Flow per Screen, mgd</td>
<td>2.0</td>
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<tr>
<td>Maximum Hydraulic Capacity per Screen, mgd</td>
<td>6.85</td>
</tr>
<tr>
<td>Maximum Upstream Liquid Level, inches</td>
<td>23.25</td>
</tr>
<tr>
<td>Maximum Clean Water Headloss, inches</td>
<td>13</td>
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<tr>
<td>Bar Spacing, inches</td>
<td>¼</td>
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<tr>
<td>Nominal Screening Basket Diameter, inches</td>
<td>47</td>
</tr>
<tr>
<td>Maximum Allowable Cleaning Cycle Time, seconds</td>
<td>9</td>
</tr>
<tr>
<td>Screening Channel Width, inches</td>
<td>50</td>
</tr>
<tr>
<td>Nominal Screw Conveyor Diameter, inches</td>
<td>10</td>
</tr>
<tr>
<td>Minimum Screen Invert to Discharge Height, inches</td>
<td>173</td>
</tr>
<tr>
<td>Speed Reducer Minimum Service Factor</td>
<td>1.63</td>
</tr>
<tr>
<td>Speed Reducer Minimum Torque Rating, in.-lb</td>
<td>26,900</td>
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<tr>
<td>Speed Reducer Minimum Thrust Rating, lbf</td>
<td>8,400</td>
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<tr>
<td>Drive Motor Size, hp</td>
<td>2</td>
</tr>
<tr>
<td>Electrical Power Characteristics, VAC-Phase-Hertz</td>
<td>460/3/60</td>
</tr>
<tr>
<td>Motor and Solenoid Valve Electrical Classification</td>
<td>Non-Hazardous</td>
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<tr>
<td>Maximum Spray Wash System Flow Rate, gal/min</td>
<td>20</td>
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<tr>
<td>Minimum Spray Wash System Pressure, psig</td>
<td>60</td>
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<tr>
<td>Lower Wash System Number of Nozzles</td>
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<tr>
<td>Liquid Level Sensing System Type</td>
<td>Float switch</td>
</tr>
<tr>
<td>Electrical Enclosure Type</td>
<td>NEMA 4X stainless steel</td>
</tr>
</tbody>
</table>

1.04 PRE-QUALIFICATION

A. All equipment manufacturers not listed in the specifications shall submit at least 15 days prior to the advertised date for receipt of bids a “Qualification Package” for the substitute or “or equal” equipment which the manufacturer proposes to furnish in lieu of products identified in the Contract Documents. The Bidder shall submit the Qualification Package under separate cover. Each Qualification Package shall be bound with protective cover, identify the specification section number and title, and the product manufacturer’s name on a cover sheet. The manufacturer shall submit the Qualification Package in a sealed sturdy box or suitable container. This section outlines the procedures for proposal of substitute or “or equal” items by “Alternate” manufacturers.

B. The use of this pre-qualification requirement is intended to protect the OWNER and Bidders so that no one Bidder gains an unfair bid price advantage by quoting a lower price for a screen that does not comply with the minimum performance and salient features set for by Section 11330.

C. The “Qualification Package” for the substitute or “or equal” equipment item of products the manufacturer proposes to furnish shall include but not be limited to, the following information as defined in 1.04.D.

D. The Qualification Package submittal requirements for the equipment shall be as follows:
1. The quality assurances set forth in Section 11330-1.09 for the substitute or "or equal" equipment item.
2. A complete set of drawings, specifications, catalogue cut-sheets, and detailed descriptive material of proposed equipment items or products. This information shall identify all technical and performance requirements stipulated on each drawing and in each specification section.
3. Detailed vendor information shall be submitted for all buy-out items such as hardware, motors, bearings, reducers, belts, sheaves, motor controllers and instrumentation (field device, major control panel device, and anticipated control panel layout).
4. List showing materials of construction of all components, including all buy-out items.
5. Certification that the specified machining noted in paragraph 2.09.F. of all mating surfaces is part of the manufacturing process for the specified screen.
6. Certification that the drive speed reducer manufacturer is a member of AGMA and that the torque and thrust rating are in accordance with AGMA standards.
7. AWS welding inspector certifications in accordance with paragraph 2.09.G.
8. Manufacturer's recommended spare parts, including all buy-out items.
9. Information on equipment field erection requirements including weight of assembled components and weight of each sub-assembly.
10. A maintenance schedule showing the required maintenance, frequency of maintenance, lubricants and other items required at each regular preventative maintenance period, including all buy-out items.
11. Process equipment electrical requirements and schematic diagrams
12. Provide a copy of this specification with a check next to each item to which the proposed equipment meets the specified standard. Where the proposed equipment does not strictly meet the requirements of this specification, provide information on the proposed exception to the specification that would bring the proposed, equipment into compliance with the requirements of this section.
13. Confirmation that the manufacturer has regularly engaged in the manufacturing and production of 3-plane cylindrical fine screen equipment in the United States for a minimum of five (5) years. No equipment will be supplied by any manufacturer with less than five years experience.

The manufacturer must have installed and had in satisfactory use in this application a minimum of twenty (20) installations of identical type (3-plane cylindrical bar screen) and size (47-inch diameter and larger) units as noted in paragraph 1.03.C.7. Provide a list of twenty (20) U.S. installations of similar type equipment comparable to the units specified.

The term “installations” shall mean individual projects/contracts. Multiple equipment units for a project will be considered as one (1) installation toward meeting the experience requirements. Installations shall be only those in the United States (fifty states). The installation shall include, but not be limited to, the following:
a. Name and location of installation.
b. Name of person in direct responsible charge for the equipment.
c. Address and phone number of person in direct responsible charge.
d. Month and year the equipment was placed in operation.
e. Brief description of equipment
f. Provide the name, address, and phone number of the contact person at the company that will provide service (both warranty period and post-warranty period) for the unit to the owner.

Bids from manufacturers lacking the U.S. experience requirements, but meeting all technical and performance requirements of the Contract Documents, can be considered if the manufacturer provides a satisfactory two (2) year maintenance bond in lieu of evidence of experience and operation. Maintenance bond shall be for 150 percent of the replacement value of the equipment. The bonding company shall have a policy-holder rating of A+ and a financial rating of "Class XV" in the most recent edition of "Best Key Rating Guide". The bonding company shall be licensed to do business in the State of Georgia.

14. Hydraulic performance curves showing the relationship of headloss versus the full range of downstream liquid depths for the maximum hydraulic capacity noted in paragraph 1.03.C.3., the average flow noted in paragraph 1.03.C.2. and 33% of the average flow noted in paragraph 1.03.C.2. Curves based upon other manufacturer's data will not be acceptable for this project.

15. Data from three (3) separate tests proving compliance of the screen with the "Paint Filter Test" as described in EPA Publication SW-846 Method 9095B.

16. Submittal Review Deposit, in the form of a certified bank check in the amount of $2,000 made payable to the OWNER. This deposit will be used for Engineer’s review of substitute equipment. The Engineer’s review time will be deducted at a rate of $150.00 per hour for reviewing substitution requests, regardless of whether the substitution is approved or rejected. The OWNER will return any unused funds to the petitioner within 30 days of the bid date.

E. If the Bidder fails to furnish all of the preceding information which has been deemed necessary by the Engineer to evaluate a proposed substitute or “or equal” equipment, the proposed substitute or “or equal” qualification package will be rejected by the Engineer.

F. The Engineer shall be the sole authority for determining conformance of a proposed substitute or “or equal” equipment item or product with the minimum requirements of the Contract Documents. Under no circumstances will the Engineer be required to prove that an “Alternate” major equipment item or product is not equal to the specified equipment item or product.

G. Failure to furnish the preceding information shall be cause for rejection of a proposed substitute or “or equal” equipment item or product for use on this project.

1.05 PERFORMANCE

A. The 3-plane cylindrical bar screen shall be designed to handle the maximum hydraulic capacity noted in paragraph 1.03.C.3. with the maximum upstream liquid level noted in paragraph 1.03.C.4. This maximum upstream liquid depth includes the maximum allowable clean water headloss noted in paragraph 1.03.C.5.
B. The nominal bar spacing noted in paragraph 1.03.C.6. shall be the clear opening between the fixed bar elements only. Screen designs that define the bar spacing as the distance between a fixed bar element and a moving adjacent rake element (step-type screen) will not be acceptable for this project. Screens using perforated plate, traveling filter media, fabric wire or wedge wire will not be acceptable for this project.

C. The average bar screen flow through velocity shall not exceed 3.3 ft/sec (1.0 m/sec) under any flow condition up to the maximum hydraulic capacity noted in paragraph 1.03.C.3. The screen design shall minimize solids deposition in the channel.

D. The 3-plane cylindrical bar screen shall be a rotary raked, cylindrical bar screen with an integral screw conveyor and press. The 3-plane cylindrical bar screen shall use a single drive for screening, conveying, dewatering and compressing screening material.

E. The operation of the rake cleaning mechanism shall be automatically initiated at a preset high liquid level. Screens that operate continuously or via timer only will not be acceptable. The rake shall remove solids from the screenings basket and deposit them into the concentric screw conveyor trough after passing through a cleaning comb, where reverse movement of the rake shall provide positive cleaning of the rake mechanism. The screenings shall be transported up the screw conveyor and through a compression chamber.

F. The screening equipment shall produce dewatered screenings capable of passing the EPA Paint Filter Test as described in method 9095B of EPA Publication SW-846.

G. Due to the high solids loadings in wastewater, the entire screen basket shall be completely cleaned in no more than the maximum allowable time noted in paragraph 1.03.C.8. to ensure minimum headloss and rapid cleaning of the screen. All open spaces of the screen shall be positively cleaned via teeth that pass through the full depth of the bars during each cleaning cycle. Spray wash water or screw flights with brushes will not be an acceptable method of cleaning the screen.

H. The control system shall be designed so that the cleaning characteristics of the screen and spray wash systems can be changed via the programmable controller. Systems that do not offer this feature will not be considered for this project.

1.06 SCREENINGS WASHING

A. Each screen shall be furnished with a dual screenings spray wash system to flush organic material from the screenings prior to compaction and dewatering. The dual screenings washing systems shall be designed to minimize the amount of organic material in the screenings and to maximize solids dryness after compaction and dewatering. The dual screenings washing systems shall include:

1. Lower wash system shall be located immediately prior to the point where the screenings are removed from the screen and enter the screenings transport tube. This wash system shall prewash the screenings to remove fecal material and to prevent material from sticking to the screw conveyor flights.

2. Screenings wash system shall be located just prior to the beginning of the compaction zone after maximum maceration of the screenings by the screenings transport screw conveyor. At
the maximum wash water flow rate noted in paragraph 1.03.C.18. the screw conveyor shall be designed to prevent screenings from being washed down the screenings transport tube to the basket.

1.07 ODOR CONTROL

A. To minimize odors and nuisance insect populations, the 3-plane cylindrical bar screen transport system and compaction/dewatering system shall be completely enclosed.

B. The spray wash systems shall be completely enclosed to prevent spray, aerosols, and leakage from coming in contact with the operating floor.

1.08 MATERIALS QUALITY

A. All fabricated components of the screen shall be AISI Type 304 stainless steel including the screen basket, screw conveyor, protective cover, outer screw conveyor housing and support structure. Materials thicknesses identified in PART 2 - PRODUCTS are the minimum requirements for this project. Materials with increased thicknesses will be acceptable.

B. To ensure spare parts availability, all fabricated components shall be manufactured in the United States. To ensure prompt service and to ensure spare parts availability in a timely manner and at a reasonable cost, foreign fabricated materials of construction for the components identified in paragraph 1.08.A. will not be acceptable for this project.

1.09 QUALITY ASSURANCE

A. In order to assure uniform quality, ease of maintenance and minimal parts storage, it is the intent of these Specifications that all equipment called for under this Section shall be supplied by a single manufacturer. The equipment manufacturer shall, in addition to the CONTRACTOR, assume the responsibility for proper installation and functioning of the equipment.

B. Naming a Manufacturer in paragraph 2.01 does not relieve them from complying with the performance requirements, salient features and the Made in the USA requirements of the Contract Documents. The Contract Documents represent the minimum acceptable standards for the screening equipment for this project. All equipment shall conform fully in every respect to the requirements of the respective parts and sections of the drawings and specifications. Equipment that is a "standard product" with the manufacturer shall be modified, redesigned from the standard mode, and shall be furnished with special features, accessories, materials of construction or finishes as may be necessary to conform to the quality mandated by the technical and performance requirements of the specification.

PART 2 - PRODUCTS

2.01 MANUFACTURER

A. The 3-plane cylindrical bar screen assembly and screw conveyor shall include all necessary equipment and appurtenances as manufactured by Lakeside Equipment Corporation, of Bartlett, Illinois.
2.02 3-PLANE CYLINDRICAL BAR SCREEN

A. Screen

1. The 3-plane cylindrical bar screen shall be designed and built to withstand maximum possible static and hydraulic forces exerted by the liquid to the screen. All structural and functional parts shall be sized for the loads encountered during the screening, conveying and pressing operations. All submerged components and all components of the 3-plane cylindrical bar screen in contact with the screened solids shall be of stainless steel construction.

2. The screen basket shall be of a cylindrical shape that shall be open at the top. The screen bars shall be perpendicular to the centerline of the screen. The basket ring support bars shall have adequately machined slots so that the rake teeth can penetrate the basket ring bars to ensure proper clearing of the full basket depth.

3. The screen basket shall use graduated depth bars to provide three (3) distinct screening planes (bar heights) on the screen interior to provide superior solids capture and removal from the flow. Designs that utilize a single bar height will not be acceptable for this project. The nominal bar spacing shall be as noted in paragraph 1.03.C.6. Perforated plate, fabric wire, wedge wire or lamella plates will not be acceptable screen media.

4. Each ring shall be fabricated from sections that have been cut from flat cold rolled stainless steel sheet to minimize warping of the rings. Basket ring designs manufactured from rolled bar stock into rings will not be acceptable for this project. Each basket ring section shall be provided with an integral strengthening gusset at each attachment point to the support bars for added basket strength. The stainless steel support bars shall be machined with slots to provide the proper bar spacing as specified in paragraph 1.03.C.6. Each basket ring shall be inserted into the machined slot of the basket support bars and then welded to the support bars to provide a superior strength basket design.

5. The main screen basket upper support ring shall be a minimum of 5/8-inch thick and shall be machined to match the transport tube main support flange to ensure proper alignment of the basket and the rotating rake arm in accordance with paragraph 2.09.F. The main screen basket lower support ring shall be 7/8-inch minimum thickness.

6. The minimum diameter of the screening basket shall be as noted in paragraph 1.03.C.7. The basket diameter shall be matched with a sufficient number of bar spacings to ensure the maximum hydraulic capacity flow rate noted in paragraph 1.03.C.3. is achieved and to provide less than the maximum headloss noted in paragraph 1.03.C.5.

7. The width of the screening channel shall be as noted in paragraph 1.03.C.9.

8. A hinged protective guard fabricated of 12-gauge minimum thick stainless steel or FRP shall be provided to cover the open top of the screen basket. Hinges and mounting hardware shall be stainless steel.

9. Side seal plates shall be provided to enclose the circular screen and the rectangular concrete channel. Side seal plates shall be two-piece fabricated of 10 gauge minimum stainless steel and shall be of sufficient height to prevent bypassing of flow around the screen at the maximum hydraulic capacity flow rate noted in paragraph 1.03.C.3.
10. The screen shall be provided with a pivoting support stand allowing for easy removal of the screen basket from the channel for maintenance purposes. To ensure operator safety during servicing of the screen, supports and support stand shall be fabricated from 1/4-inch minimum stainless steel shapes and plates.

11. A set of stainless steel lower screen basket support brackets fabricated of 1/4-inch sections shall be provided to support the basket in the channel. Support brackets shall allow vertical adjustment of the screen basket so that it does not rest on the channel floor.

B. Rotating Rake and Cleaning Comb

1. The rotating rake assembly shall penetrate the depth of the bar screen to ensure positive solids removal. Rake shall be water-jet or laser cut stainless steel for superior life. Designs using a fabricated rake head or that use a screw conveyor with a brush to clean the screen will not be acceptable for this project. Rake tooth root design shall match the 3-plane design of the basket rings to ensure proper cleaning of the screen bars.

2. The rake shall reverse at least once during the cleaning cycle to pass through the topmost position where it shall be cleaned by a water-jet or laser cut stainless steel hinged cleaning comb installed at the top of the screen basket. Fabricated cleaning comb designs will not be acceptable for this project. The cleaning comb shall be designed to match the rake profile to ensure cleaning of the spaces to the root of each tooth in the 3-plane rake design. Cleaning comb shall be supported at both ends and shall pivot and return to the standby position without the use of counterweights.

3. The rotating rake and the screw conveyor shall be fixed to the same shaft and driven by a common drive.

4. A stainless steel backed nylon brush shall be attached to the rake arm and positioned to make contact with the screening trough to sweep material caught on the edges of the trough.

C. Screenings Conveyor and Screenings Dewatering Press

1. The screenings screw conveyor transport tube nominal diameter shall be as noted in paragraph 1.03.C.10. with a minimum Schedule 10S pipe wall thickness. A minimum of three (3) anti-rotation bars with 1/4-inch minimum thickness shall be welded to the inside of the transport tube along the longitudinal axis from the compaction zone to the beginning of the screenings collection trough. The screenings screw conveyor shall not depend on support from the anti-rotation bars during normal operation.

2. A basket support plate flange shall be a minimum of 3/4-inch and shall be welded to the lower end of the screenings transport tube complete with strengthening gussets to attach the screen basket and to provide for attachment of the screenings collection hopper. A 1/2-inch minimum thick drive support flange shall be welded to the upper end of the screenings transport tube for attachment of the drive assembly. After all welding of components to the screenings transport tube have been completed the fabrication shall be placed in a lathe to machine the face of the upper drive flange, to machine the face of the lower basket support plate flange for mating the basket and to machine the lower bearing housing in accordance with paragraph 2.09.F. A 1/2-
inch thick minimum drive assembly adaptor stainless steel flange shall be provided to bolt to the upper drive support flange.

3. The dewatering screw shall be designed to transport and dewater the screened material. Screw flights shall be stainless steel with a minimum thickness of 3/16-inch with increased 3/8-inch thick minimum thickness in the screenings collection trough and in the compaction and dewatering zone. Flight pitch distance shall be a maximum in the screenings collection hopper and shall be reduced along the length of the screenings transport tube to a minimum pitch distance in the compaction zone. Constant pitch screenings screw conveyor designs will not be acceptable for this project.

4. The upper and lower screenings conveyor torque tube shall be fitted with a solid stainless steel stub shaft. The shafts and screenings screw conveyor torque tube shall be accurately machined in accordance with paragraph 2.09.F. to allow a shrink-fit and welded design for the upper drive end stub shaft and lower tail bearing stub shaft. Bolting the stub shafts to the screening transport screw conveyor torque tube will not be acceptable for this project.

5. The lower end of the screenings conveyor shall be supported by a sealed, self-lubricated lower polymeric composite sleeve bearing with stainless steel wear sleeve. Metallic-based lower bearings will not be acceptable for this project. The lower bearing shall not take any thrust load from the screw conveyor. A minimum of two seals shall be provided each with a UHMW polyethylene seal retainer plate. The stainless steel bearing housing shall be field replaceable and shall be machined in accordance with paragraph 2.09.F. to mate with the screenings collection housing by a bolted connection. Designs in which the bearing housing is welded directly to the screen body will not be acceptable for this project.

6. Rake arm attachment hub outer diameter shall match the outer diameter of the stationary bearing housing to minimize material wrapping around the shaft. A seal plate shall be furnished to mate between the stationary lower bearing support and the rotating arm to prevent material intrusion into the bearing seals. The rake arm attachment hub shall be split to provide compression fit along with a key and keyway.

7. Drainage holes shall be provided along the entire length of the screenings collection trough invert to allow for gravity drainage of washwater without flushing screenings out of the trough. Drainage hole diameter shall be smaller than the bar spacing noted in paragraph 1.03.C.6. The width of the drainage section shall be based upon a minimum 65-degree arc. The drainage section perforated plate material shall be fabricated from 11 gauge minimum thick stainless steel and shall have a minimum 50% open area for free water drainage.

8. A compaction zone shall be an integral part of the screenings screw conveyor and transport tube design. The compaction zone shall be designed to form a screenings plug of material and to return water released from the screened material back to the wastewater channel through circular holes that are machined into the screenings transport tube. Compaction zone shall be fabricated from 12 gauge minimum thick stainless steel welded to the screenings transport tube to provide a watertight screenings pressate collection chamber. Compaction zone housings that are non-metallic and which require seals to prevent leakage around the screenings transport tube will not be acceptable for this project. Compaction zone housing shall be furnished with a hinged and sealed access cover held in place with stainless steel latches as well as a removable dewatering section panel inside the dewatering chamber to allow direct access to the screw conveyor should the compaction zone ever become plugged. Designs that require removal of
the drive assembly, discharge head or screw conveyor to gain access to the compaction zone will not be acceptable for this project.

9. Water that is released from the screenings shall be returned via a reinforced rubber hose attached to the dewatering section. Drain design shall allow for removal and cleaning of the drain hose should it ever become plugged without removing the drive, discharge head or screw conveyor.

10. Screen minimum invert to discharge height shall be as noted in paragraph 1.03.C.11.

D. Drive Assembly

1. The rake mechanism and transport screw shall be driven by a direct-connected cycloidal-helical hollow-shaft high-thrust in-line speed reducer as shown on the drawings. The cyclo element of the speed reducer shall be designed to take a 500 percent shock load without damage. The speed reducer manufacturer shall be a member of AGMA. Combination gear motor designs will not be acceptable for this project. The speed reducer shall have a minimum torque rating as noted in paragraph 1.03.C.12. and a minimum thrust rating as noted in paragraph 1.03.C.13.

2. The speed reducer shall be bolted to the drive adaptor flange at upper end of the screenings transport tube.

3. The speed reducer shall be driven by a field replaceable NEMA C-flanged, 1,800 rev/min, ball bearing, continuous-duty, totally enclosed, fan-cooled motor with leads to a large conduit box. The reducer shall utilize a taper grip bushing to connect to the drive shaft of the screw conveyor. The use of keys and keyways will not be an acceptable connection method for this project.

4. Motor size shall be as noted in paragraph 1.03.C.14., shall be rated for electrical power characteristics as noted in paragraph 1.03.C.15. and shall be rated for an environment as noted in paragraph 1.03.C.16.

5. Chain-drives, belt drives, hydraulic drives or a separate upper bearing for the transport screw will not be acceptable for this project.

6. A proximity sensor for locating the rake position shall be mounted to the outer drive housing with a fabricated stainless steel bracket. Limit switches or other electro-mechanical position sensing devices will not be acceptable for this project.

E. Spray Wash Systems

1. Three (3) spray systems shall be provided. Each spray wash system shall be furnished with a control solenoid valve, stainless steel piping and fittings, flexible reinforced PVC hose and nozzles. Piping, fittings and valves shall be 3/4-inch diameter minimum. A plant water strainer shall be provided for the incoming plant water supply. The wash water flow requirements shall be as noted in paragraph 1.03.C.17. with a minimum pressure as noted in paragraph 1.03.C.18. The three (3) spray wash systems shall include:

a. Lower spray wash system shall be located near the upper end of the screenings basket just prior to where screenings enter the screw conveyor transport tube. The lower wash system
shall have the minimum of spray nozzles as noted in paragraph 1.03.C.19. Lower spray wash bars without replaceable spray nozzles will not be acceptable.

b. Screenings spray wash system shall be located in the upper section of the transport tube no more than 17 inches from the beginning of the compaction zone to break up and return organic materials to the flow stream and to ensure maximum screenings washing. A minimum of one (1) spray nozzle shall be provided. The screenings spray wash system and screenings screw conveyor shall be designed to prevent washing screenings down the center of the screw conveyor.

c. The dewatering chamber flush water system shall periodically clean the compaction and dewatering zone via a stainless steel wash nozzle located in the compaction/dewatering chamber. The dewatering chamber flush water system shall not be a substitute for the screenings washing systems described in paragraphs 2.02.E.1.a. and 2.02.E.1.b.

2. The three (3) wash system solenoid valves shall be 3/4-inch minimum, brass body suitable for 120 VAC operation with a rating as noted in paragraph 1.03.C.16. Solenoid valves shall be normally closed and rated for up to 150 psig. Solenoid valves shall be slow close type to minimize water hammer.

3. Solenoid valves shall be factory installed to a piping manifold to ensure even pressure distribution to each spray wash system. The solenoid valve wiring shall be factory installed to a common junction box on the spray wash manifold for wire nut connection to external power. Conduit and fittings shall be factory installed between the solenoid valves and junction boxes. Junction box, conduit and fittings shall be rated NEMA 4X for a non-hazardous electrical environment as noted in paragraph 1.03.C.16.

4. Water strainer shall be provided that is suitable for a 3/4-inch NPT connection and a maximum flow rate as noted in paragraph 1.03.C.17. and suitable for a maximum pressure as noted in paragraph 1.03.C.18. Water filter shall be a stacked filter element design with washable 80-mesh (200 micron) polyethylene or polypropylene disc elements, polypropylene head and bowl and Buna N gaskets. Y-type strainers will not be acceptable for this project.

2.03 CONTROL SYSTEM

A. All controls necessary for the fully automatic operation of the screen shall be provided in accordance with NEMA standards.

B. A position sensor and target shall be externally-mounted on the drive unit for ease of operator access and shall provide a "home" location for the 3-plane cylindrical bar screen operation during the cleaning cycle. Position sensors with internally-mounted targets inside the screenings screw conveyor will not be acceptable for this project.

C. The electrical control system shall provide for automatic control of the screen via a high liquid level using a liquid level control system in connection with an adjustable time clock. The screen shall operate at a high liquid level and or a pre-determined time sequence to provide a variable time between cleaning operations.

D. The float switches shall be a hermetically sealed, axially non-position sensitive type, mercury-switch activated and enclosed in a polypropylene housing. The switches shall operate over a
narrow switching angle and have a minimum rating of 1 amp at 120 volts. A 20 ft PVC jacketed power cable, weight, grip cord, and stainless steel mounting bracket shall be furnished as part of the switch assembly. The level switching circuit shall be rated intrinsically safe by inclusion of a UL approved switch isolator with relay output. The switch isolator shall be rated for 120-volt service with output contacts rated for 2 amps minimum. A second high-level float switch shall be included for alarm indication.

E. A local-mounted panel suitable for wall mounting shall contain the following items:

1. Door interlocked fused disconnect
2. Process controller complete with LCD display providing field settable/adjustable/access to process parameters and for providing specific indications of each type of fault that may occur. Controller ram shall be backed up with non-volatile memory which will load automatically if ram is corrupted.
3. Variable frequency drive (VFD) with line reactor
4. Control power transformer fused primary and secondary with 120VAC transient voltage surge suppressor (TVSS)
5. Full voltage LED pilot lights for the following:
   a. Control power on (White)
   b. Multifunctional overload shutdown/screen fault (Red)
   c. High level (Amber)
6. E-stop push button (Red)
7. Re-set push button (Black)
8. Hand-Off-Auto selector switches for the following:
   a. Screen drive
   b. Common wash system solenoid valves
9. Forward-Off-Reverse selector switch (spring return to center) for screen drive
10. Door-mounted elapsed time meter
11. Remote dry contact outputs for the following:
    a. Screen Running
    b. Malfunction alarm
    c. High water level alarm
12. Weather protection system heat tracing circuit breaker
13. Plant water heat tracing (250 WATTS MAX BY CONTRACTOR) circuit breaker
14. Flashing alarm light
15. Set spare fuses
16. White phenolic nameplates with black lettering
17. 600 VAC terminal block
18. U.L. panel label per the application
19. Electrical enclosure shall be provided in accordance with paragraph 1.03.C.21.

2.04 SCREENINGS BAGGER

A. The discharge chute shall be furnished with a bagging device to contain and encase dewatered screenings.

B. The bagging device mounting assembly shall be fabricated of 12 gauge minimum stainless steel.
C. The screenings bagger shall be designed to be fitted with a continuous hose cassette. Bagger shall be supplied with two continuous hose cassettes.

2.05 COLD WEATHER PROTECTION

A. The screenings discharge transport tube shall be furnished with a heat tracing system for outdoor weather protection that shall completely enclose the screenings transport tube, compaction and dewatering zone, screenings discharge drop chute and all spray wash piping and solenoid valves.

B. The cold weather protection system shall include heat tracing, adjustable thermostat, insulation and a protective jacket. Heat tracing shall be suitable for an electrical environment as noted in paragraph 1.03.C.16.

C. The heat tracing system shall be suitable for operation down to a minimum temperature of -25°C (-13°F) and shall be powered from the main control panel.

D. Weather protection system protective cover shall be molded fiberglass reinforced polyester laminate, or a custom fit, coated fiberglass cloth jacket. Fabricated metallic or plastic covers that are bolted or riveted together will not be acceptable for this project.

E. The molded fiberglass reinforced polyester laminate, shall have the exterior surface gel coated for ultraviolet radiation protection. Fiberglass shall have a glass content of not less than 30%, a tensile strength of not less than 22,000 psi, a flexural strength of not less than 25,000 psi and Barcol hardness of not less than 40. Finished fiberglass must withstand a temperature of 200°F without blistering, pinholes, warping or other defects. Gel coat shall be provided with impregnated pigment for exterior light gray color. The weather protection package cover shall be designed to support a wind load of 30 lb per square foot.

F. The weather protection package fiberglass cover sections shall be split into two sections when mounted axially along the transport tube. Weather protection system fiberglass cover sections shall extend from the discharge chute over the compaction and dewatering zone and down to the main basket support flange gussets. Each split fiberglass cover section shall be connected via fiberglass flanges and no more than six (6) stainless steel thumb screws for ease of operator access. Each fiberglass cover section shall be designed so that the insulation is completely encapsulated within the fiberglass to prevent water intrusion and damage. Designs utilizing loose fiberglass or foam insulation that are not encapsulated in FRP will not be acceptable for this project. Each fiberglass half section shall be approximately 2 feet long with molded fiberglass flanges. Individual sections shall be connected via fiberglass flanges and a stainless steel V-ring captive clamping system for easy installation and removal.

G. Where the wash water supply and electrical wiring conduit penetrates the fiberglass cover bulkhead adapters shall be provided.

H. All fasteners to assemble the fiberglass cover components shall be stainless steel.

I. The custom fit, coated fiberglass cloth jacket shall be removable and replaceable. The inner and outer jacketing and the side gussets shall be fabricated from a minimum of 18 oz/sq yd Teflon coated fiberglass cloth containing a minimum of 1-inch thick insulation core of Type E fiberglass mat. Seam closures shall be Teflon coated fiberglass thread and fasteners shall be Teflon straps with stainless steel D-rings. Weather flaps of Teflon cloth shall cover seams and slits and will be
fastened with Velcro hook and loop closures. 3-inch wide Teflon cloth terminal end flaps with Nomex drawstrings sewn into the sides of the jacket shall be provided. Identification tags in AISI Type 304 stainless steel with embossed lettering shall be provided.

J. A fabricated composite weather enclosure shall be provided for the water strainer specified in paragraph 2.02.E.4. Enclosure shall be provided with a removable cover.

K. The plant water supply system piping to the screen and the water strainer described in paragraph 2.02.E.4. shall be provided with heat tracing and insulation by the CONTRACTOR. The MANUFACTURERS control panel shall be provided with sufficient low voltage power to handle up to an additional 250 Watts from the CONTRACTOR supplied plant water heat tracing system.

2.06 ANCHOR BOLTS

A. Equipment manufacturer shall furnish all anchor bolts of ample size and strength required to securely anchor each item of equipment. Anchor bolts, hex nuts, and washers shall be AISI Type 304 stainless steel unless noted otherwise. Anchor bolts shall be wedge or epoxy type.

B. Anchor bolts shall be set by the CONTRACTOR. Equipment shall be placed on the foundations, leveled, shimmed, bolted down, and grouted with a non-shrinking grout.

2.07 SPARE PARTS

A. The following spare parts shall be provided:
   1. One (1) solenoid valve re-build kit
   2. One lower bearing composite sleeve bearing, one set lower bearing seals and one screenings conveyor lower shaft wear sleeve
   3. One (1) proximity sensor

B. Spare parts shall be individually boxed with the project name and part number clearly identified on each individual box. All spare parts shall be shipped in a separate crate and clearly labeled. Spare parts shall be stored indoors by the Contractor in a temperature-controlled environment.

2.08 SHOP SURFACE PREPARATION AND PAINTING

A. Electric motors, speed reducers, and other self-contained or enclosed components shall have manufacturer's standard enamel finish.

B. All external non-wetted stainless steel shall be cleaned to a uniform finish by glass bead blasting and chemically treating with Citrisurf 2210 or 2050. No hazardous wastes shall be produced during fabrication because Citrisurf is a citric acid based product that is non-toxic. The cylindrical bar screen manufacturer shall clearly identify the passivation procedure methodology and shall certify that no hazardous wastes were produced.

2.09 SOURCE QUALITY CONTROL

A. All structural stainless steel components shall be fabricated in the United States and shall conform to the requirements of "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings" published by the American Institute of Steel Construction.
B. All parts and assemblies shall be fabricated from sheets and plates of AISI Type 304 stainless steel conforming to ASTM A666, unless noted otherwise. All rolled or extruded shapes shall be fabricated to conform to ASTM A276. All tubular products and fittings shall be fabricated to conform to ASTM A312, A351 and A403.

C. All welding in the factory shall use shielded arc, inert gas, MIG or TIG method. Add filler wire to all welds to provide for a cross section equal to or greater than the parent metal does. All butt welds shall be full penetration type to the interior surface. Provide gas shielding to interior and exterior of the joint.

D. Welding of the screen components shall be in accordance with the latest edition of the American Welding Society (AWS) standards. Field welding of stainless steel will not be permitted.

E. Bolts, nuts and washers shall be AISI 304 stainless steel furnished in accordance with ASTM A193.

F. All surfaces that are specified to be machined shall be designed and fabricated to provide a runout of not more than 0.005 inches and concentricity to within 0.005 inches.

G. Design and fabrication of structural steel members shall be in accordance with AISC and AWS Standards. The manufacturer shall comply with the American Welding Society (AWS) and the American Institute of Steel Construction (AISC) most current listed standards and qualifications in 2004 D1.1, the criteria per the requirements of Section 6 - Inspection - Structural Welding Code. Evidence of such AWS and AISC compliance shall be submitted with shop drawing submittals as follows:

1. AWS Certified Welding Inspectors (minimum 2 on staff) shall conform to all standards, current or previous as listed in section 6.1.4 AWS QC1, Standard and Guide for Qualification and Certification of Welding Inspectors.

2. AWS Non Destructive Testing Inspectors (Level I, II, III) for Magnetic Particle and Ultrasonic testing (minimum 2 on staff) shall conform to all standards, current or previous as listed in and in conformance with The American Society for Non-Destructive Testing (ASNT-TC-1A).

PART 3 - EXECUTION

3.01 FIELD PREPARATION AND PAINTING

A. Finish field preparation and painting shall be performed as specified in Section ___________.

B. The CONTRACTOR shall touch-up all shipping damage to the paint and stainless steel as soon as the equipment arrives on the job site.

C. The CONTRACTOR shall supply paint for field touch-up and field painting.

D. The CONTRACTOR shall finish paint electrical motors, speed reducers, and other self-contained or enclosed components with oil-resistance enamel.
E. Prior to assembly the CONTRACTOR shall coat all stainless steel bolts and nut threads with a non-seizing compound.

3.02 INSTALLATION

A. The manufacturer shall schedule one (1) trip to the project site for equipment start-up assistance as noted in paragraph 3.02.B. for the CONTRACTOR and for operating training as noted in paragraph 3.03.C. for OWNER personnel.

B. After the CONTRACTOR has installed the 3-plane cylindrical bar screen and the equipment is capable of being operated, the equipment manufacturer shall furnish a qualified representative for a minimum of two (2) days to perform start-up inspection of the equipment and training for the CONTRACTOR.

C. After the equipment has been placed into operation, the manufacturer's representative shall make all final adjustments for proper operation.

3.03 SHOP TESTING

A. Prior to shipment of the equipment the screen shall be operated for a minimum of four (4) hours at the fabrication location with the specific drive motor that will be furnished for the project at the actual operating angle of the screen for the project.

B. During the shop test the following parameters shall be recorded:

   1. Motor serial number
   2. Amperage draw at start-up, after two hours and after four hours during forward operation
   3. Amperage draw during reverse operation

C. A certified shop test report shall be submitted to the ENGINEER.

3.04 FIELD TESTING

A. Prior to final acceptance of the screen, three (3) tests shall be conducted according to the EPA Paint Filter Test as described in method 9095B of EPA Publication SW-846.

B. Should the system fail to produce screenings capable of passing the "EPA Paint Filter Test", the manufacturer shall at its own expense make all necessary modifications to the equipment until such tests can be passed.

3.05 OPERATOR TRAINING

A. Provide operator training for OWNER'S personnel after system is operational. Training will take place while manufacturer's representative is at the job site for inspection.

END SECTION 11330
Exhibit D:
Grit Separator Information
# Budgetary Proposal

**August 2, 2018**

**LAKESIDE EQUIPMENT CORPORATION**

**Dan Widdel**

630/837-5640, ext. 225
dw@lakeside-equipment.com

**TO**

Chip McGaughey, P.E.
Engineering Management, Inc.
303 Swanston Drive
Lawrenceville, GA 30043

**PROJECT**

Burrow County, Georgia
Tanner's Bridge Headworks

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## EQUIPMENT

**LAKESIDE SPIRAGRIT VORTEX GRIT SYSTEM**

Model SG10-7.0

<table>
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<th>Unit Price</th>
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<td>$122,000</td>
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Due to the current volatility of steel prices, budgetary cost of equipment may be subject to change.

### SPIRAGRIT DESIGN DATA

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<tr>
<th>Description</th>
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<tr>
<td>Peak Design Flow:</td>
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<tr>
<td>Upper Grit Chamber Diameter:</td>
<td>10.00 feet</td>
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<tr>
<td>Lower Storage Hopper Diameter:</td>
<td>5.00 feet</td>
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<tr>
<td>Inlet Channel Width:</td>
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<table>
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<tr>
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<td>Water Fluidization Requirement:</td>
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<td>Grit Pumping Flow Rate:</td>
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<tr>
<td>Grit Classifier Conveying Capacity:</td>
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### SPIRAGRIT COMPONENTS

- Paddle drive assembly with 1 hp motor
- 10-inch drive tube with four (4) paddles
- Inlet baffle and floor plate
- 4-inch suction pipe
- 1.5-inch fluidization line with solenoid valve
- Self-prime grit pump with 7.5 hp motor
- Type W grit classifier
- Grit cyclone
- Bagging device for grit classifier
- Anchorage - stainless steel
- Shop prime paint of all ferrous components
- Spare parts

**Components are carbon steel construction unless noted otherwise**

### EXCLUSIONS

- Erection of equipment
- Bridge or grating over grit chamber
- Grit slurry piping from grit pump to grit classifier

###CONTROL PANEL

- Non-explosion proof design
- NEMA 4X - 304 stainless steel main control panel
- No local control station
- Fusible disconnect switch with door handle
- Control power transformer
- Adjustable timers
- Full voltage motor starters with overload protection
- Selector switches
- Indicating lights

###OPTIONAL ITEMS

- Explosion-proof design package
- Type 304 stainless steel grit chamber components
- Type 304 stainless steel grit classifier

###NOTES

- **FOB:** Chariton, Iowa
- **Freight:** Freight allowed to jobsite
- **Start-Up Service:** 2 days in 1 trip
- **Warranty:** One (1) year

- **Approvals:** 6 to 8 weeks
- **Shipment after Approval:** 18 to 20 weeks
- **Weight per SpiraGrit & Classifier:** 6,400 lbs
- **Installation Time per SpiraGrit & Classifier:** 80 hours
## Lakeside SpiraGrit Vortex Grit Chamber, Model SG10-7.0

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<tr>
<th>Specification</th>
<th>Details</th>
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<td>Upper chamber inside diameter</td>
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<td>Lower hopper inside diameter</td>
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<td>Drive tube nominal diameter</td>
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<td>Grit drive maximum operating speed</td>
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<td>Paddle assembly</td>
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### Drive Motor:

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<td>Phases, Frequency, Voltage</td>
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<td>Duty</td>
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### Control Panel:

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<td>Components</td>
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<td>Fusible disconnect switch with door handle</td>
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<tr>
<td></td>
<td>Starters (grit drive, grit pump, grit classifier)</td>
</tr>
<tr>
<td></td>
<td>Adjustable timers</td>
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<tr>
<td></td>
<td>Transformer</td>
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<tr>
<td></td>
<td>Cabinet heater with thermostat</td>
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<tr>
<td></td>
<td>Control switches</td>
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<td></td>
<td>Indicator lights</td>
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<tr>
<td></td>
<td>Elapsed time meters</td>
</tr>
<tr>
<td></td>
<td>600 VAC terminal block</td>
</tr>
</tbody>
</table>
Grit Classifier:

Maximum conveying capacity ........................................ 30 cu-ft/hour
Maximum underflow from cyclone ................................... 60 gpm
Nominal screw diameter .................................................. 12 in.

Grit Classifier Motor:

Rated Effect ................................................................. 1.0 HP
Rotations ................................................................. 1,800 rpm
Phases, Frequency, Voltage ........................................... 3 ph / 60 Hz / 230-460 Volt
Enclosure ............................................................... TEFC
Duty .............................................................. Continuous
Classification ............................................. Non-explosion proof

Grit Cyclone:

Brand ............................................................ Krebs
Inlet ................................................................. 4 in.
Overflow ............................................................ 6 in.

Grit Pump:

Brand .......................................................... Gorman Rupp
Type .......................................................... Self-prime
Flow Rate ......................................................... 250 gpm
Inlet / Outlet Size .................................................. 4 in.
Motor Size .......................................................... 5.0 to 7.5 HP (typ.)
Lakeside SpiraGrit
Vortex Grit Chamber

Energy Efficient Grit Removal
in a Compact Design
Lakeside's SpiraGrit Vortex Grit Chamber

The Lakeside SpiraGrit Vortex Chamber effectively removes inorganic grit from treatment plant influent in a mechanically induced vortex environment. The SpiraGrit operates efficiently over a wide range of daily flow rates. Rotating paddles maintain the flow velocity in the vortex chamber keeping organics in suspension while allowing heavier grit to settle to the chamber floor. The settled grit is moved across the stationary floor plate toward the center opening and into the lower grit hopper. Grit is then removed from the lower hopper by an air lift or recessed impeller pump and sent to a Grit Classifier.

SpiraGrit Vortex Grit Chamber Advantages

- **Compact Design** requiring significantly less space
- **High Removal Efficiency** throughout the design flow range
- **Steady Performance** flow variations in the tank have no influence on operation
- **Low Head Loss** 1/4-inch maximum through the unit
- **Simultaneous Separation and Dewatering** resulting in cleaner grit
- **Reduced Maintenance** no submerged bearings or other parts requiring maintenance

Standard Features

- Drive Assembly
- Drive Tube
- Adjustable Rotating Paddles
- Air Scour & Air Lift Supply Inlets
- Inlet Baffle
- Stationary Floor Plate
- Electrical Control Plate
- Grit Classifier

Optional Features

- **All Stainless Steel Construction** for superior corrosion resistance.
- **Recessed Impeller Pump** with cyclone separator and/or grit classifier.
- **Blower Package** complete with blower, belt drive, mounting base, inlet filters and silencers, pressure safety valve and fiberglass enclosure.
- **Bagging Attachment** with replaceable bags for dewatered grit.

Complete Your Headworks with a Lakeside Micro Strainer or Fine Screen
LAKESIDE EQUIPMENT CORPORATION
Water and Wastewater Treatment Equipment
P.O. Box 8448
Bartlett, IL 60103

VORTEX GRIT REMOVAL EQUIPMENT
BARROW COUNTY, GEORGIA

PART 1 - GENERAL

1.01 SUMMARY

A. The CONTRACTOR shall furnish, install and place into satisfactory operating condition grit collection equipment and appurtenances as shown on the drawings and described in the specifications.

B. It is the intent of these Specifications that all equipment called for under this Section shall be supplied by a single manufacturer.

C. Related Sections

1. General Conditions, Supplementary Conditions, and General Requirements sections apply to work of this Section.

1.02 REFERENCES

A. American Institute of Steel Construction (AISC)

B. American Society of Testing and Materials (ASTM)

C. American Society of Civil Engineers (ASCE)

D. American Welding Society (AWS)

E. Steel Structures Painting Council (SSPC)

1.03 SYSTEM DESCRIPTION

A. The grit collection equipment shall be of the “vortex” type, complete with drive unit, air bell, drive tube, paddle assembly, self-priming grit pump, cyclone separator, grit classifier, electrical control panel and necessary anchorage.

B. Systems for this project, other than a “vortex” type grit collection system will not be considered.

C. General Design Summary:

1. Number of Grit Systems

................................................................. - 1
2. Maximum Grit Chamber Hydraulic Capacity, mgd - 7.0
3. Average Design Flow, mgd - 2.0
4. Peak Design Flow, mgd - 5.0

D. Grit Chamber Design Summary:

1. Grit Chamber Inside Diameter, feet - 10.0
2. Grit Hopper Inside Diameter, feet - 5.0
3. Grit Chamber Drive Motor Size, hp - 1.0
4. Grit Chamber Maximum Operating Speed, rev/min - 14
5. Drive Tube Nominal Diameter, inches - 10

E. Grit Cyclone Design Summary:

1. Maximum Capacity, gal/min - 250
2. Inlet Diameter, inches - 4
3. Outlet Diameter, inches - 6
4. Vortex Finder, inches - 4

F. Grit Classifier Design Summary:

1. Maximum Underflow from Cyclone, gal/min - 25
2. Maximum Grit Conveying Capacity, cu ft/hr - 30
3. Grit Classifier Motor Size, hp - 1.0

G. Self-Priming Grit Pump Design Summary:

1. Maximum Capacity, gal/min - 250
2. Total Dynamic Head, feet - 
3. Discharge Diameter, inches - 4
5. Area Classification - Non-Hazardous

1.04 SUBMITTALS

A. Unless named in the specifications, all equipment manufacturers who intend to bid on the Section 11321 equipment shall submit to the ENGINEER not less than fourteen (14) days prior to the bid date a complete pre-qualification package. The pre-qualification package shall include but not be limited to the following:

1. The equipment manufacturer shall have a minimum of fifteen (15) years experience in the manufacture of Grit Collection Systems.

2. A complete set of drawings, specifications, catalog cut-sheets, and detailed descriptive material. This information shall identify all technical and performance requirements stipulated on the drawings and in the specification.
3. Detailed information shall be submitted for all items such as hardware, motors, reducers, motor controllers and instrumentation (field devices, major control panel devices, and anticipated control panel layout).

4. List showing materials of construction of all components.

5. Manufacturer's recommended spare parts.

6. Information on equipment field erection requirements including total weight of assembled components and weight of each sub-assembly.

7. A maintenance schedule showing the required maintenance, frequency of maintenance, lubricants and other items required at each regular preventative maintenance period, including all buy-out items.

8. Process equipment electrical requirements and schematic diagrams.

9. Complete list of deviations from the drawings and specifications.

B. Refer to Section _________ for shop drawing submittal requirements.

1.05 PERFORMANCE

A. The grit removal system shall be engineered to meet the following requirements at the peak design flow noted in paragraph 1.03.C.4:

1. Remove 95% of grit greater than 50 mesh in size.

2. Remove 85% of grit greater than 70 mesh in size.

3. Remove 65% of grit greater than 100 mesh in size.

The efficiency level relates to grit having a specific gravity of 2.65 and to the difference in grit content in the influent channel as compared to that of the effluent in the effluent channel.

B. The grit classifier shall be designed to receive underflow from the cyclone separator up to a maximum flow rate as noted in paragraph 1.03.F.1 and to convey a maximum grit capacity as noted in paragraph 1.03.F.2.

1.06 QUALITY ASSURANCE

A. In order to assure uniform quality, ease of maintenance and minimal parts storage, it is the intent of these Specifications that all equipment called for under this Section shall be supplied by a single manufacturer. The equipment manufacturer shall, in addition to the CONTRACTOR, assume responsibility for proper installation and function of the equipment.

B. Naming a manufacturer in paragraph 2.01.A does not relieve them from complying with the performance and salient features of the Contract Documents. The Contract Documents represent the minimum acceptable standards for the grit removal equipment for this project. All equipment shall conform fully in every respect to the requirements of the respective parts and sections of the
drawings and specifications. Equipment which is a "standard product" with the manufacturer shall be modified, redesigned from the standard mode, and shall be furnished with special features, accessories, materials of construction or finishes as may be necessary to conform to the quality mandated by the technical and performance requirements of the specification.

PART 2 – PRODUCTS

2.01 MANUFACTURER

A. The grit collection system shall include all necessary equipment and appurtenances as manufactured by Lakeside Equipment Corporation, of Bartlett, Illinois.

2.02 GRIT CHAMBER

A. Drive Unit

1. The grit removal drive mechanism shall consist of an electrical motor, a helical reduction unit, and an enclosed final reduction unit consisting of one pinion and an integral gear/bearing. All components are directly coupled, eliminating the use of chains and V-belts. The drive mechanism shall not be overloaded under normal operating conditions and shall be designed for heavy duty 24 hour per day service.

2. The external tooth gear shall be an external gear/bearing unit such as manufactured by Rotek, Inc., Kaydon, Inc., or equal. The gear teeth shall be AGMA grade 6 or higher. The gear teeth shall have a core hardness of 250 to 300 BHN, and shall be induction hardened to a surface hardness of 52 to 60 Rc. The bearing raceway shall be hardened to 58 to 60 Rc, precision ground and have a minimum 20.5-inch ball path diameter. The main bearing shall be oil bath lubricated and have a B10 life in excess of 100 years. The main bearing shall have a seal to prevent contamination of the bearing raceway.

3. The final reduction pinion shall be made of heat-treated alloy steel and shall be mounted on the output shaft of the reduction gearbox. The gear teeth shall have a core hardness of 300-350 BHN, and shall be induction hardened to a surface hardness of 52 to 60 Rc.

4. The final reduction pinion and main gear shall have a service factor of 5.0, or greater, at the operating speed as noted in paragraph 1.03.D.4.

5. The helical reduction unit shall drive the pinion of the final reduction unit. The helical reduction unit shall have a minimum service factor of 2.0. The helical reduction unit bearings shall have an average B10 life in excess of 100,000 hours.

6. The helical reduction unit shall be driven by a C-flanged, 1,800 rev/min, 3 phase, 60 Hertz, 230/460 volt, ball bearing, continuous-duty, totally-enclosed, fan-cooled motor with leads to a large conduit box. Motor size shall be as noted in paragraph 1.03.D.3.

7. The fabricated and machined steel final reduction unit housing shall be manufactured of A36 steel plate. All welds shall conform to applicable specifications of the American Welding Society.
After welding, all mounting and mating surfaces shall be machined to insure proper fit and alignment of the drive pinion and mating gear.

8. The base plate on which the gear/bearing is mounted shall be a minimum of 1.125-inches thick. The surface on which the gear/bearing is mounted shall be flat within 0.005-inches. The steel plate to which the helical reduction unit is mounted shall be a minimum of 0.875-inches thick.

9. The final reduction unit housing shall be designed to prevent water from entering the housing in case of flooding by means of an air bell.

B. Drive Tube

1. The drive tube, which is driven by the main gear, shall have a nominal diameter as noted in paragraph 1.03.D.5. The drive tube shall be fabricated of (steel) (stainless steel) pipe with a minimum thickness of ¼-inches.

C. Paddle Assembly

1. The paddle assembly shall consist of four (4) fixed blades that are affixed to the drive tube by means of a two (2)-piece collar. The collar shall allow adjustment of the blade assembly in either an upward or downward position to ensure maximum grit removal. Each of the paddle blades shall be tapered with an ample rounded leading edge and a fixed pitch of 45°. The paddle assembly shall be of (steel) (stainless steel) construction.

D. Floor Plate

1. To minimize the possibility of organic capture, the grit collector shall have a ½-inch thick (steel) (stainless steel) floor plate in the grit chamber. The floor plate shall consist of two (2) removable sections to allow access to the grit storage hopper.

E. Inlet Baffle

1. A ¼-inch thick (steel) (stainless steel) baffle shall be furnished at the inlet channel to optimize the chamber's hydraulic conditions.

F. Grit Fluidizing System

1. A water supply line for the purpose of fluidizing settled grit shall be furnished at the bottom of the grit storage hopper. The water supply line shall include a 1.5-inch diameter manual stainless steel ball valve for flow adjustment and a 1.5-inch diameter solenoid valve to control the intermittent operation of the grit fluidization.

2. Solenoid valve shall be brass body suitable for 120 VAC operation, normally closed, and rated for up to 100 psig. The Solenoid valve shall be slow close type to minimize water hammer.

2.03 SELF-PRIMING GRIT PUMP

A. The grit pump shall be a Gorman-Rupp Company Super Series T Model T4A71S-B/F, or equal, self-priming pump. The pump shall be a 4-in. by 4-in. design and shall be capable of pumping a grit
slurry flow rate as noted in paragraph 1.03.G.1. at a total dynamic head as noted in paragraph 1.03.G.2.

B. The pump casing shall be Gray Iron No. 30 with a maximum operating pressure of 86 psig. The impeller shall be a two-vane design to handle a 3-in. maximum sphere size and shall be fabricated of G-R Hard Iron material for superior abrasion resistance. The impeller shaft shall be 4150 alloy steel. The pump shall be provided with a replaceable wear plate of hardened alloy steel for superior abrasion resistance. A removable cover plate shall be provided of Gray Iron No. 30.

C. The suction side of the pump shall be provided with a flap valve fabricated of steel reinforced neoprene.

D. The bearing housing shall be fabricated of Gray Iron No. 30. The seal plate shall be G-R Hard Iron material for superior abrasion resistance. The shaft sleeve shall be 4130 alloy steel. The radial bearing shall be an open single ball bearing design. The thrust bearing shall be an open double ball bearing design. The bearing and seal cavity shall be oil lubricated by SAE No. 30 non-detergent oil. The bearing and seal cavity shall be provided with oil level sight gauges.

E. The pump suction and discharge connections shall be 125 lb flanges fabricated of Gray Iron No. 30. Gaskets shall be Buna-N, synthetic fibers, vegetable fibers, PTFE, cork and rubber. O-rings shall be Buna-N.

F. Mounting hardware shall be standard plated steel. A brass pressure relieve valve shall be provided.

G. The pump seal shall be cartridge type, mechanical, oil-lubricated, double floating, self-aligning complete with tungsten carbide rotating and stationary faces, AISI Type 316 stainless steel seat, Viton fluorocarbon elastomers and 18-8 stainless steel cage and spring.

H. Motor size shall be as noted in paragraph 1.03.G.4., shall be rated for electrical power characteristics as noted in paragraph 1.03.D.14. and shall be rated for an environment as noted in paragraph 1.03.G.5.

I. Power transmission from the motor to the pump shall be by means of a set of V-belts and sheaves. Belts and sheaves shall be designed with a minimum 1.5-service factor based on motor horsepower. Sheaves shall be two section units for both drive and driven sheaves and shall consist of a tapered split shaft bushing with three tapped holes to which the sheave is attached by three cap screws. Changing sheaves shall not require a wheel puller. Belts and sheaves shall be covered with a fabricated steel belt guard.

J. Pump and motor shall be provided on a fabricated steel base with an adjustable motor base for belt tension.

2.04 CYCLONE

A. Each cyclone shall consist of a heavy-duty fabricated steel volute feed chamber with cylindrical and conical sections. Each section of the cyclone shall be completely lined and protected from the high velocity grit by a replaceable neoprene liner. The cyclone shall be constructed so any section liner can be replaced independently. The inlet and overflow connections shall be of 150 lb. ANSI FF steel flanges.
B. The cyclone vortex finder shall be made of an abrasion-resistant alloy with an approximate hardness of 500 Brinell. A hinge and quick disconnect clamp shall be provided between the apex assembly and lower cone section to allow removal of material which may clog the apex, without disconnecting any piping on the cyclone itself. The apex shall consist of a steel or aluminum housing with a replaceable manually adjustable neoprene liner. Each cyclone inlet shall be tapped for a 1.25" NPT gauge connection and shall be furnished with a diaphragm-protected pressure gauge.

C. The cyclone underflow shall feed into the classifier for washing and dewatering, and will be sized so that the proper hydraulic loading is provided to the classifier.

D. The cyclone overflow piping shall be furnished by the contractor, which must be adequately vented to prevent siphoning.

2.05 GRIT CLASSIFIER

A. Each classifier shall be designed to handle a maximum underflow from the grit cyclone as noted in paragraph 1.03.F.1. The grit classifier shall comprise a complete (steel) (stainless steel) assembly including drive, helicoid screw conveyor, fabricated trough with supports and necessary anchorage parts.

B. Grit from the grit cyclone shall be discharged into the dewatering section of the trough and removed by the helical screw conveyor oriented at the angle of 16 degrees. The screw conveyor shall be capable of handling a maximum quantity of grit as noted in paragraph 1.03.F.2. The screw conveyor shall be 12-inch minimum diameter fabricated with (steel) (stainless steel) flights welded to a rotating 3-inch diameter Schedule (40 steel) (40S stainless steel) pipe torque tube. The sectional flights shall be a ½ pitch design fabricated of ½-inch minimum thickness with either a field renewable ½-in wide Lincore 60G hardened continuous weld on leading face of the screw flights or shall be provided with field replaceable Ni-hard wear shoes. The drive end of the conveyor screw shall consist of 3-inch minimum diameter (steel) (stainless steel) stub shaft that is shrink-fit and welded to the upper end of the screw conveyor torque tube. The lower end of the screw shall have a 3-inch minimum diameter (steel) (stainless steel) shaft shrink-fit and welded to the lower end of the screw conveyor torque tube. Bolting the upper and lower stub shafts to the screw conveyor torque tube will not be acceptable for this project. The lower end of the grit dewatering screw shall be supported with a sealed, self-lubricated polymeric composite sleeve bearing with a stainless steel wear sleeve. The removable bearing housing, which is greased packed, shall be mounted to the outside of the classifier tank via a bolted connection for ease of field replacement.

C. The grit conveyor screw shall operate in a washing-classifying trough fabricated with ¼-inch (steel) (stainless steel) minimum plate, fitted with a grit inlet and discharge connection. Cyclone inlet housing to the classifier shall be fabricated of 12 gauge (steel) (stainless steel) sheet. The grit discharge chute shall be fabricated of Schedule (10 steel) (10S stainless steel) pipe. The grit classifier tank shall be provided with a 4-inch diameter plain end Schedule (40 steel) (40S stainless steel) overflow pipe stub. A 2-inch diameter Schedule (40 steel) (40S stainless steel) NPT half coupling with pipe plug shall be provided to drain the tank. The supports for the grit cyclone and grit classifier tank shall be fabricated of structural (steel) (stainless steel) sections with a ¼-inch minimum thickness. The grit classifier shall be provided with an 11 gauge minimum thick (steel) (stainless steel) split cover. The cover shall be provided with both a section that is bolted to the
classifier tank and a hinged cover section complete with stainless steel butt hinges and stainless steel lifting handle to open up the hinged cover section. A neoprene gasket shall be glued to the upper classifier tank lip to prevent leakage between the classifier tank and the cover.

D. Grit laden wastewater piping from the grit pump to the grit classifier and wash water return piping from the grit classifier shall be provided by the CONTRACTOR.

E. The grit classifier screw conveyor shall be driven by a direct-connected cycloidal-helical hollow-shaft high-thrust in-line speed reducer design for a maximum output speed of 12 rev/min. The cyclo element of the speed reducer shall be designed to take a 500 percent shock load without damage. The speed reducer manufacturer shall be a member of AGMA. Combination gear motor designs will not be acceptable for this project.

F. The speed reducer shall be bolted to the drive adaptor flange at upper end of the grit classifier tank. The reducer shall utilize a taper grip bushing to connect to the drive shaft of the screw conveyor. The use of keys and keyways will not be an acceptable connection method for this project.

G. The speed reducer shall be driven by a field replaceable NEMA C-flanged, 1,800 rev/min, ball bearing, continuous-duty, totally enclosed, fan-cooled motor with leads to a large conduit box.

H. Motor size shall be as noted in paragraph 1.03.F.3.

2.06 CONTROL SYSTEM

A. All controls necessary for the fully automatic operation of the grit chamber drive, grit pump, and grit classifier shall be provided. The controls shall be designed to insure sufficient protection against overload in order to prevent equipment damage.

B. The local-mounted main control panel shall include the following items:

1. Fusible disconnect switch with door handle
2. 480/120 VAC control transformer with one (1) set of spare fuses
3. Motor starters with overload coils for the grit chamber drive, grit pump, and grit classifier
4. 24-hour time clock for cycle starts
5. Adjustable timers for grit pump and grit classifier
6. 150 watt cabinet heater with fixed setting thermostat for outdoor installations
7. Current monitor for grit chamber drive, grit pump and grit classifier
8. Elapsed time meters
10. Running [green lens] pilot lights for the grit chamber drive, grit pump, and grit classifier
11. H-O-A selector switches for the grit pump and grit classifier motors
12. On-Off selector switch for the grit chamber drive
13. Cycle start pushbutton
14. Overload shutdown [red lens] pilot light
15. Overload shutdown reset pushbutton
16. Dry contacts for connection to an external alarm system
17. Phenolic nameplates
18. Terminal block
19. Emergency stop pushbutton
20. U.L. panel label per the application
21. Alarm horn and silencer-reset pushbutton
22. NEMA 4X stainless steel wall-mounted enclosure

2.07 GRIT BAGGER

A. The grit classifier discharge chute shall be furnished with a bagging device to contain and encase dewatered grit.

B. The bagging device shall be fabricated of 12 gauge minimum (steel) (stainless steel).

C. The bagging device shall be designed to be fitted with 230 ft of continuous hose complete with two (2) spare hose cartridges.

2.08 ANCHOR BOLTS

A. Equipment manufacturer shall furnish all anchor bolts of ample size and strength required to securely anchor each item of equipment. Anchor bolts, hex nuts, and washers shall be AISI Type 304 stainless steel unless noted otherwise. Anchor bolts shall be J-type embedded. Expansion type anchors will not be acceptable.

B. Anchor bolts shall be set by the CONTRACTOR. Equipment shall be placed on the foundations, leveled, shimmed, bolted down, and grouted with a non-shrinking grout.

2.09 SHOP SURFACE PREPARATION AND PAINTING

A. All fabricated carbon steel or cast iron components for submerged service shall be near-white blast cleaned per SSPC-SP10 and given a 2.5 to 3.5 mil dry film thickness coat of Tnemec Series 1 Omnithane Primer.

B. All fabricated carbon steel or cast iron components for non-submerged service shall be commercial blast cleaned per SSPC-SP6 and given a 2.5 to 3.5 mil dry film thickness coat of Tnemec Series 1 Omnithane Primer.

C. All external non-wetted stainless steel shall be cleaned to a uniform finish by glass bead blasting and chemically treating with Citrisurf 2210 or 2050. No hazardous wastes shall be produced during fabrication because Citrisurf is a citric acid based product that is non-toxic. The cylindrical bar screen manufacturer shall clearly identify the passivation procedure methodology and shall certify that no hazardous wastes were produced.

D. Electric motors, speed reducers, drive units, and other self-contained or enclosed components shall be supplied with the manufacturer’s standard finish coating.

E. Apply rust preventative compound to all machined, polished, and nonferrous surfaces that are not to be painted.

2.10 SOURCE QUALITY CONTROL
A. All structural steel components shall be fabricated in the United States and shall conform to the requirements of the "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings" published by the American Institute of Steel Construction.

B. Except where specifically indicated otherwise, all plates and structural members shall have a minimum thickness of ¼-inch.

C. The equipment manufacture’s shop welds and welding procedures shall be in accordance with the requirements of the latest edition of ANSI/AWS D1.1 “Structural Welding Code – Steel” published by the American Welding Society.

D. Bolts, nuts and washers shall be AISI 304 stainless steel furnished in accordance with ASTM A193.

PART 3 – EXECUTION

3.01 FIELD PREPARATION AND PAINTING

A. Finish field preparation and painting shall be performed as specified in Section___________.

B. The CONTRACTOR shall touch-up all shipping damage to the paint as soon as the equipment arrives on the job site.

C. The CONTRACTOR shall supply paint for field touch-up and field painting.

D. Prior to assembly all stainless steel bolts and nut threads shall be coated with a non-seizing compound by the CONTRACTOR.

3.02 INSTALLATION

A. The manufacturer shall schedule one (1) trip to the project site for equipment start-up assistance and inspection of installed equipment for proper operation as noted in paragraph 3.02.B.

B. After the CONTRACTOR has installed the grit removal system and the unit is capable of being operated, the equipment manufacturer shall furnish a qualified representative for a minimum of two (2) days to inspect the equipment and to supervise field testing and start-up for the CONTRACTOR.

C. After the equipment has been placed into operation, the manufacturer’s representative shall make all final adjustments for proper operation.

3.03 OPERATOR TRAINING

A. Provide operator training for OWNER’S personnel after the system is operational. Training shall take place while manufacturer's representative is at the job site for equipment inspection.

END SECTION 11321
Exhibit E:
Sequential Batch Reactor (SBR) Information,
Phase 1 and Phase 2
Process Design Report

BARROW CNTY TANNERS BRIDGE GA
Design#  153713
Option: Revised SBR Design (Phase 1 Round)

AquaSBR®
Sequencing Batch Reactor

October 9, 2018
Designed By:  Paula Dorn
Design Notes

Pre-SBR

- Elevated concentration of Hydrogen Sulfide can be detrimental to both civil and mechanical structures. If anaerobic conditions exist in the collection system, steps should be taken to eliminate Hydrogen Sulfide prior to the treatment system.

- Neutralization is recommended/required ahead of the SBR if the pH is expected to fall outside of 6.5-8.5 for significant durations.

- Coarse solids removal/reduction is recommended prior to the SBR.

SBR

- The maximum flow, as shown on the design, has been assumed as a hydraulic maximum and does not represent an additional organic load.

- The decanter performance is based upon a free-air discharge following the valve and immediately adjacent to the basin. Actual decanter performance depends upon the complete installation including specific liquid and piping elevations and any associated field piping losses to the final point of discharge. Modification of the high water level, low water level, centerline of discharge, and / or cycle structure may be required to achieve discharge of full batch volume based on actual site installation specifics.

Aeration

- The aeration system has been designed to provide 1.25 lbs. O2/lb. BOD5 applied and 4.6 lbs. O2/lb. TKN applied at the design average loading conditions.

- Depending on the actual yard piping from the blowers to the diffuser system and the heat losses associated with the yard piping, additional provisions for cooling of the air (i.e. incorporating heat exchangers) and/or modification of in-basin piping and/or diffuser sleeve material may be required. Aqua-Aerobic Systems, Inc. may need to modify the following equipment offering to ensure compatibility of all in-basin components with actual air temperatures.

Digester

- Digester supernatant or sludge dewatering filtrate return to the SBR without chemical addition is not recommended to avoid increasing the SBR influent phosphorus levels due to re-release of phosphorus in the digester.

- A supernatant return device is recommended in the digester.

- The digester will share a common standby blower with the SBR.

Process/Site

- Temperatures and elevation have been assumed as displayed on the design.

- The anticipated effluent NH3-N requirement is predicated upon an influent waste temperature of 12° C or greater. While lower temperatures may be acceptable for a short-term duration, nitrification below 10° C can be unpredictable, requiring special operator attention.

- Sufficient alkalinity is required for nitrification, as approximately 7.1 mg alkalinity (as CaCO3) is required for every mg of NH3-N nitrified. If the raw water alkalinity cannot support this consumption, while maintaining a residual concentration of 50 mg/l, supplemental alkalinity shall be provided (by others).

- NOTE: This system has been designed to be expandable from a Phase I average flow of 1.0 MGD to an ultimate Phase II average flow of 2.0 MGD. This expansion will utilize the Phase I post-equalization basin as an additional digester in Phase II and will require an additional blower. The upgrade will require the construction of two additional SBR basins along with adding transfer pumps to handle Phase II flows. Phase I blowers may need to be rebelted and sheaved to meet Phase II operating requirements (by others). The engineer should give thought to piping and site layout to facilitate the expansion.

- To achieve the effluent monthly average total phosphorus limit, the biological process and chemical feed systems need to be designed to facilitate optimum performance.

- A minimum of twelve (12) daily composite samples per month (both influent and effluent) shall be obtained for total phosphorus analysis.
- Influent to the biological system is a typical municipal wastewater application with a TP range of 6–8 mg/l. Influent TP shall be either in a particle associated form or in a reactive soluble phosphate form or in a soluble form that can be converted to reactive phosphorus in the biological system. Soluble hydrolyzable and organic phosphates are not removable by chemical precipitation with metal salts. A water quality analysis is required to determine the phosphorus speciation with respect to soluble and insoluble reactive, acid hydrolyzable and total phosphorus at the system influent, point(s) of chemical addition, and final effluent.

- Chemical feed lines (i.e. metal salts) shall be furnished to each reactor, aerobic digester and dewatering supernatant streams as necessary. Metal salts shall be added to each reactor during the React phase of the cycle.

- pH monitoring of the biological reactor is required when adding metal salts.

**Anticipated**

- The ability to meet the anticipated effluent organic nitrogen concentration is contingent upon the system's ability to hydrolyze the influent organic nitrogen to NH3-N. A certain fraction of the organic nitrogen may be refractory and, therefore, will not be biologically converted.

**Equipment**

- The basin dimensions reported on the design have been assumed based upon the required volumes and assumed basin geometry. Actual basin geometry may be circular, square, rectangular or sloped with construction materials including concrete, steel or earthen.

- Rectangular or sloped basin construction with length to width ratios greater than 1.5:1 may require alterations in the equipment recommendation.

- The basins and/or basin modifications are not included and shall be provided by others.

- Influent is assumed to enter the reactor above the waterline, located appropriately to avoid proximity to the decanter, splashing or direct discharge in the immediate vicinity of other equipment.

- If the influent is to be located submerged below the waterline, adequate hydraulic capacity shall be made in the headworks to prevent backflow from one reactor to the other during transition of influent.

- Scope of supply includes freight, installation supervision and start-up services.

- The control panel does not include motor starters or VFDs, which should be provided in a separate MCC (by others).

- Equipment selection is based upon Aqua Aerobic Systems' standard materials of construction and electrical components.

- Aqua-Aerobic Systems, Inc. is familiar with various “Buy American” Acts (i.e. AIS, ARRA, Federal FAR 52.225, EXIM Bank, USAid, PA Steel Products Act, etc.). As the project develops Aqua-Aerobic Systems can work with you to ensure full compliance of our goods with various Buy American provisions if they are applicable/required for the project. When applicable, please provide us with the specifics of the project’s “Buy American” provisions.

- VFDs are recommended for the operation of the post-equalization blower.
**AquaSBR - Sequencing Batch Reactor - Design Summary**

**DESIGN INFLUENT CONDITIONS**

<table>
<thead>
<tr>
<th></th>
<th>Avg. Design Flow</th>
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</tr>
</thead>
<tbody>
<tr>
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**DESIGN PARAMETERS**

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<tr>
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<th>Influent</th>
<th>Required &lt;=</th>
<th>Anticipated &lt;=</th>
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<tr>
<td>Bio/Chem Oxygen Demand:</td>
<td>BOD5 350</td>
<td>BOD5 10</td>
<td>BOD5 10</td>
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<tr>
<td>Total Suspended Solids:</td>
<td>TSS 350</td>
<td>TSS 20</td>
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<tr>
<td>Total Kjeldahl Nitrogen:</td>
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<tr>
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**SITE CONDITIONS**

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<th>Elevation (MSL)</th>
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**SBR BASIN DESIGN VALUES**

<table>
<thead>
<tr>
<th></th>
<th>Water Depth</th>
<th>Basin Vol./Basin</th>
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</thead>
<tbody>
<tr>
<td>No./Basin Geometry:</td>
<td>= 2 Circular Basin(s)</td>
<td>Min = 13.0 ft = (4.0 m)</td>
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<tr>
<td>Freeboard:</td>
<td>= 2.0 ft = (0.6 m)</td>
<td>Avg = 16.2 ft = (4.9 m)</td>
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<tr>
<td>Diameter of Basin:</td>
<td>= 73.0 ft = (22.3 m)</td>
<td>Max = 21.0 ft = (6.4 m)</td>
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</tbody>
</table>

Number of Cycles: = 5 per Day/Basin (advances cycles beyond MDF)

Cycle Duration: = 4.8 Hours/Cycle

Food/Mass (F/M) ratio: = 0.095 lbs. BOD5/lb. MLSS-Day

MLSS Concentration: = 4500 mg/l @ Min. Water Depth

Hydraulic Retention Time: = 1.015 Days @ Avg. Water Depth

Solids Retention Time: = 12.6 Days

Est. Net Sludge Yield: = 0.778 lbs. WAS/lb. BOD5

Est. Dry Solids Produced: = 2269.7 lbs. WAS/Day = (1029.5 kg/Day)

Est. Solids Flow Rate: = 200 GPM (27210 GAL/Day) = (103.0 m³/Day)

Decant Flow Rate @ MDF: = 3472.0 GPM (as avg. from high to low water level) = (219.0 l/sec)

LWL to CenterLine Discharge: = 2.1 ft = (0.6 m)

Lbs. O2/lb. BOD5 = 1.25

Lbs. O2/lb. TKN = 4.60

Actual Oxygen Required: = 5011 lbs./Day = (2272.8 kg/Day)

Air Flowrate/Basin: = 1567 SCFM = (44.4 Sm3/min)

Max. Discharge Pressure: = 10.7 PSIG = (74 KPA)

Avg. Power Required: = 1212.3 KW-Hrs/Day
**POST-SBR EQUALIZATION DESIGN PARAMETERS**

Avg. Daily Flow (ADF): = 1 MGD = (3,785 m³/day)

Max. Daily Flow (MDF): = 2.5 MGD = (9,464 m³/day)

Decant Flow Rate from (Qd): = 3,472 gpm = (13.1 m³M)

Decant Duration (Td): = 72 min

Number Decants/Day: = 10

Time Between Start of Decants: = 144 min

**POST-SBR EQUALIZATION VOLUME DETERMINATION**

The volume required for equalization/storage shall be provided between the high and the low water levels of the basin(s). This Storage Volume (Vs) has been determined by the following:

\[ V_s = [(Q_d - (MDF \times 694.4)) \times T_d = 124,984 \text{ gal} = (16,709.1 \text{ ft}^3) = (473.2 \text{ m}^3)] \]

The volumes determined in this summary reflect the minimum volumes necessary to achieve the desired results based upon the input provided to Aqua. If other hydraulic conditions exist that are not mentioned in this design summary or associated design notes, additional volume may be warranted.

Based upon liquid level inputs from each SBR reactor prior to decant, the rate of discharge from the Post-SBR Equalization basin shall be pre-determined to establish the proper number of pumps to be operated (or the correct valve position in the case of gravity flow). Level indication in the Post-SBR Equalization basin(s) shall override equipment operation.

**POST-SBR EQUALIZATION BASIN DESIGN VALUES**

No./Basin Geometry: = 1 Circular Basin(s)

Diameter of Basin: = 50.0 ft = (15.2 m)

Min. Water Depth: = 1.5 ft = (0.5 m) Min. Basin Vol. Basin: = 22,030.5 gal = (83.4 m³)

Max. Water Depth: = 10.0 ft = (3.1 m) Max. Basin Vol. Basin: = 147,014.5 gal = (556.6 m³)

**POST-SBR EQUALIZATION EQUIPMENT CRITERIA**

Mixing Energy with Diffusers: = 0.2 SCFM/ft² of reactor

SCFM Required to Mix: = 471 SCFM/basin = (801 Nm³/hr/basin)

Max. Discharge Pressure: = 4.9 PSIG = (33.81 KPA)

Mixing Energy with Mixers: = 15 HP/IMG = (3 W/m³)

NPHP Provided: = 15 = (11.2 kW)

Max. Flow Rate Required Basin: = 1,736 gpm = (6.572 m³/min)

Avg. Power Required: = 582.8 kW-hr/day
Aerobic Digester - Design Summary

**AEROBIC DIGESTER DESIGN PARAMETERS**

- **Sludge Flowrate to the Digester**: 27,230.0 gal/day = (103.1 m³/day)
- **Inlet Sludge Concentration**: 1.00%
- **Solids Loading to the Digester**: 2,271.0 lb/day = (1,030.1 kg/day)
- **Inlet Volatile Solids Fraction**: 72.6%

**AEROBIC DIGESTER BASIN DESIGN VALUES**

- **No./Basin Geometry**: 1 Circular Basin(s)
- **Diameter of Basin**: 50 ft = (15.2 m)
- **Min. Water Depth**: 14.7 ft = (4.5 m)
- **Min. Basin Vol. Basin**: 215,898.1 gal = (817.3 m³)
- **Max. Water Depth**: 21 ft = (6.4 m)
- **Max. Basin Vol. Basin**: 308,425.9 gal = (1,167.6 m³)

**AEROBIC DIGESTER PROCESS DESIGN PARAMETERS**

- **Solids Retention Time**: 22.7 days
- **Digester Design Temperature**: 25 C
- **Volatile Solids Destruction**: 41.5%
- **Digester Solids Concentration**: 2%
- **Oxygen Supplied for Digestion**: 2.00 lbs O₂ per lb VSS Destroyed
- **Actual Oxygen Required**: 1,368.4 lb/day = (620.7 kg/day)
- **Volatile Percentage After Digestion**: 60.8%
- **Estimated Dry Solids to be Removed**: 1,586.8 lb/day = (719.8 kg/day)
- **Volume of Solids to be Removed**: 9,512.9 gal/day = (36.01 m³/day)
- **Estimated Supernatant Volume**: 92,527.6 gal/basin = (350.26 m³/basin)
- **Assumed Supernatant Duration**: 180 minutes
- **Calculated Supernatant Flow**: 514.0 gpm = (32.4 l/sec)

1. The Volatile Solids Destruction listed above shall be used for determination of the oxygen demand during summer conditions. It should be noted that the actual VSS destruction will be dependant upon digester inlet condition, temperature, and operating conditions.

2. The Digester Solids Concentration is reflected as an average concentration, assuming the operations include frequent settling and supernating practices.

**AEROBIC DIGESTER EQUIPMENT CRITERIA**

- **SCFM Required for O₂ Demand**: 627/basin = (1,065 m³/hr/basin)
- **Max. Discharge Pressure**: 9.67 PSIG = (66.72 KPA)
- **Mixing Energy with DDMs**: 40 HP/MG = (7.88 W/m³)
- **NPHP Provided**: 15 = (11.2 kW)
- **Max. Flow Rate Required Basin**: 200 gpm = (0.757 m³/min)
- **Avg. Power Required**: 713.64 kW-hr/day
AquaSBR

Influent Valves

2 Influent Valve(s) will be provided as follows:
- 18 inch electrically operated plug valve(s).

Mixers

2 AquaDDM Direct Drive Mixer(s) will be provided as follows:
- 15 HP Aqua-Aerobic Systems Endura Series Model FSS DDM Mixer(s).

Mixer Mooring

2 Mixer pivotal mooring assembly(ies) consisting of:
- #10 AWG four-conductor electrical service cable(s).
- Electrical cable strain relief grip(s), 2 eye, wire mesh.

Decanters

2 Decanter assembly(ies) consisting of:
- 8x7 Aqua-Aerobics decanter(s) with fiberglass float, 304 stainless steel weir, galvanized restrained mooring frame, and painted steel power section with #14-10 conductor power cable.
- Decant pipe(s).
- 4” schedule 40 galvanized steel mooring post.
- Galvanized steel dewatering support post(s).
- 14 inch electrically operated butterfly valve(s) with actuator.

Transfer Pumps/Valves

2 Submersible pump assembly(ies) consisting of the following items:
- 2.7 HP Submersible Pump(s) with painted cast iron pump housing, discharge elbow, and multi-conductor electrical cable.
- Manual plug valve(s).
- 3 inch diameter swing check valve.
- Galvanized steel slide rail assembly(ies).

Retrievable Fine Bubble Diffusers

12 Retrievable Fine Bubble Diffuser Assembly(ies) consisting of:
- 25 diffuser tubes consisting of two flexible EPDM porous membrane sheaths mounted on a rigid support pipe with 304 stainless steel band clamps.
- 304 stainless steel manifold weldment.
- 304 stainless steel leveling angles.
- 304 stainless steel leveling studs.
- Galvanized vertical support beam.
- Galvanized vertical air column assembly.
- Galvanized upper vertical beam and pulley assembly.
- Galvanized top support bracket.
- 3” EPDM flexible air line with ny-glass quick disconnect end fittings.
- Galvanized threaded flange.
- 3” manual isolation butterfly valve with cast iron body, EPDM seat, aluminum bronze disk and one-piece steel shaft.
- Ny-glass quick disconnect cam lock adapter.
- 304 stainless steel adhesive anchors.
- Brace angles.

1 Diffuser Electric Winch(es) will be provided as follows:
- Portable electric winch.
Positive Displacement Blowers

3 Positive Displacement Blower Package(s), with each package consisting of:
- Aerzen 60HP Rotary Positive Displacement Blower(s).
- 6" manual butterfly valve(s).

Air Valves

2 Air Control Valve(s) will be provided as follows:
- 8 inch electrically operated butterfly valve(s) with actuator.

Level Sensor Assemblies

2 Pressure Transducer Assembly(ies) each consisting of:
- Submersible pressure transducer(s).
- Mounting bracket weldment(s).
- Transducer mounting pipe weldment(s).

2 Level Sensor Assembly(ies) will be provided as follows:
- Float switch(es).
- Float switch mounting bracket(s).
- Stainless steel anchors.

Instrumentation

2 Dissolved Oxygen Assembly(ies) consisting of:
- Thermo Fisher RDO dissolved oxygen probe with electric cable. Probe includes stainless steel stationary bracket and retrievable pole probe mounting assembly. One (1) probe per basin.
- Thermo Fisher AV38 controller and display module(s).

Aquasbr: Post-Equalization

Mixers

1 AquaDDM Direct Drive Mixer(s) will be provided as follows:
- 15 HP Aqua-Aerobic Systems Endura Series Model FSS DDM Mixer(s).

Mixer Mooring

1 Mixer restrained mooring assembly(ies) consisting of:
- Galvanized steel restrained mooring frame(s).
- #10 AWG four-conductor electrical service cable(s).
- Vinyl electrical cable float(s).
- Electrical cable strain relief grip(s), 2 eye, wire mesh.
- 4" Schedule 40 galvanized restrained mooring post(s) with base plate.

Transfer Pumps/Valves

3 Submersible pump assembly(ies) consisting of the following items:
- 10 HP Submersible Pump(s) with painted cast iron pump housing, discharge elbow, and multi-conductor electrical cable.
- Manual plug valve(s).
- 6 inch diameter swing check valve.
- Galvanized steel slide rail assembly(ies).

Retrievable Coarse Bubble Diffusers

2 Retrievable Coarse Bubble 10 Tube Diffuser Assembly(ies) consisting of:
- 316 L stainless steel wide band coarse bubble diffusers with Schedule 80 3/4" NPT male pipe thread connection with integral hex head nut.
- Galvanized manifold assembly.
- Galvanized vertical support beam.
- Galvanized upper vertical beam and pulley assembly with manual winch.
- Galvanized top support bracket.
- 3" EPDM flexible air line with ny-glass quick disconnect end fittings.
- Galvanized threaded flange.
- 3" manual isolation butterfly valve with cast iron body, EPDM seat, aluminum bronze disk and one-piece steel shaft.
- Ny-glass quick disconnect cam lock adapter.
- 304 stainless steel adhesive anchors.

Positive Displacement Blowers

1 Positive displacement Blower Package(s), with each package consisting of:

- Aerzen 40HP Rotary Positive Displacement Blower(s).
- 6" manual butterfly valve(s).

Level Sensor Assemblies

1 Pressure Transducer Assembly(ies) each consisting of:

- Submersible pressure transducer(s).
- Mounting bracket weldment(s).
- Transducer mounting pipe weldment(s).

1 Level Sensor Assembly(ies) will be provided as follows:

- Float switch(es).
- Float switch mounting bracket(s).
- Stainless steel anchors.

AquaSBR: Aerobic Digester

Mixers

1 AquaDDM Direct Drive Mixer(s) will be provided as follows:

- 15 HP Aqua-Aerobic Systems Endura Series Model FSS DDM Mixer(s).

Mixer Mooring

1 Mixer restrained mooring assembly(ies) consisting of:

- Galvanized steel restrained mooring frame(s).
- #10 AWG four-conductor electrical service cable(s).
- Vinyl electrical cable float(s).
- Electrical cable strain relief grip(s), 2 eye, wire mesh.
- 4" Schedule 40 galvanized restrained mooring post(s) with base plate.

Transfer Pumps/Valves

1 Submersible pump assembly(ies) consisting of the following items:

- 2.7 HP Submersible Pump(s) with painted cast iron pump housing, discharge elbow, and multi-conductor electrical cable.
- Manual plug valve(s).
- 3 inch diameter swing check valve.
- Galvanized steel slide rail assembly(ies).

Retrievable Coarse Bubble Diffusers

2 Retrievable Coarse Bubble 10 Tube Diffuser Assembly(ies) consisting of:

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- Galvanized manifold assembly.
- Galvanized vertical support beam.
- Galvanized upper vertical beam and pulley assembly with manual winch.
- Galvanized top support bracket.
- 3" EPDM flexible air line with ny-glass quick disconnect end fittings.
- Galvanized threaded flange.
- 3" manual isolation butterfly valve with cast iron body, EPDM seat, aluminum bronze disk and one-piece steel shaft.
- Ny-glass quick disconnect cam lock adapter.
- 304 stainless steel adhesive anchors.

**Positive Displacement Blowers**

1 Positive displacement Blower Package(s), with each package consisting of:

- Aerzen 50HP Rotary Positive Displacement Blower(s).
- 6" manual butterfly valve(s).

**Level Sensor Assemblies**

1 Sensor installation(s) consisting of:

- Submersible pressure transducer(s).
- Stainless steel sensor guide rail weldment(s).
- PVC sensor mounting pipe(s).
- Top support(s).

1 Level Sensor Assembly(ies) will be provided as follows:

- Float switch(es).
- Float switch mounting bracket(s).
- Stainless steel anchors.

**Controls**

**Controls wo/Starters**

1 Controls Package(s) will be provided as follows:

- NEMA 12 panel enclosure suitable for indoor installation and constructed of painted steel.
- Fuse(s) and fuse block(s).
- Compactlogix Processor.
- Operator interface(s).
- Remote Access Ethernet Modem.
Process Design Report

BARROW CNTY TANNERS BRIDGE GA
Design#  153714
Option: Revised SBR Design (Phase 2 Round)

AquaSBR®
Sequencing Batch Reactor

October 08, 2018
Designed By: Paula Dorn
Pre-SBR

- Elevated concentration of Hydrogen Sulfide can be detrimental to both civil and mechanical structures. If anaerobic conditions exist in the collection system, steps should be taken to eliminate Hydrogen Sulfide prior to the treatment system.

- Neutralization is recommended/required ahead of the SBR if the pH is expected to fall outside of 6.5-8.5 for significant durations.

- Coarse solids removal/reduction is recommended prior to the SBR.

SBR

- The maximum flow, as shown on the design, has been assumed as a hydraulic maximum and does not represent an additional organic load.

- The four basin SBR has been designed to receive flow such that each basin's fill period comprises the first 25% of the cycle.

- The decanter performance is based upon a free-air discharge following the valve and immediately adjacent to the basin. Actual decanter performance depends upon the complete installation including specific liquid and piping elevations and any associated field piping losses to the final point of discharge. Modification of the high water level, low water level, centerline of discharge, and/or cycle structure may be required to achieve discharge of full batch volume based on actual site installation specifics.

Aeration

- The aeration system has been designed to provide 1.25 lbs. O2/lb. BOD5 applied and 4.6 lbs. O2/lb. TKN applied at the design average loading conditions.

- Depending on the actual yard piping from the blowers to the diffuser system and the heat losses associated with the yard piping, additional provisions for cooling of the air (i.e. incorporating heat exchangers) and/or modification of in-basin piping and/or diffuser sleeve material may be required. Aqua-Aerobic Systems, Inc. may need to modify the following equipment offering to ensure compatibility of all in-basin components with actual air temperatures.

Digester

- Digester supernatant or sludge dewatering filtrate return to the SBR without chemical addition is not recommended to avoid increasing the SBR influent phosphorus levels due to re-release of phosphorus in the digester.

- A supernatant return device is recommended in the digester.

- The digester will share a common standby blower with the SBR.

Process/Site

- Temperatures and elevation have been assumed as displayed on the design.

- The anticipated effluent NH3-N requirement is predicated upon an influent waste temperature of 12° C or greater. While lower temperatures may be acceptable for a short-term duration, nitrification below 10° C can be unpredictable, requiring special operator attention.

- Sufficient alkalinity is required for nitrification, as approximately 7.1 mg alkalinity (as CaCO3) is required for every mg of NH3-N nitrified. If the raw water alkalinity cannot support this consumption, while maintaining a residual concentration of 50 mg/l, supplemental alkalinity shall be provided (by others).

- NOTE: This system has been designed to be expandable from a Phase I average flow of 1.0 MGD to an ultimate Phase II average flow of 2.0 MGD. This expansion will utilize the Phase I post-equalization basin as an additional digester in Phase II. The upgrade will require the construction of two additional SBR basins along with adding transfer pumps to handle Phase II flows. Phase I blowers may need to be rebelted and sheaved to meet phase II operating requirements (by others). The engineer should give thought to piping and site layout to facilitate the expansion.

- To achieve the effluent monthly average total phosphorus limit, the biological process and chemical feed systems need to be designed to facilitate optimum performance.
- A minimum of twelve (12) daily composite samples per month (both influent and effluent) shall be obtained for total phosphorus analysis.

- Influent to the biological system is a typical municipal wastewater application with a TP range of 6–8 mg/l. Influent TP shall be either in a particle associated form or in a reactive soluble phosphate form or in a soluble form that can be converted to reactive phosphorus in the biological system. Soluble hydrolyzable and organic phosphates are not removable by chemical precipitation with metal salts. A water quality analysis is required to determine the phosphorus speciation with respect to soluble and insoluble reactive, acid hydrolyzable and total phosphorus at the system influent, point(s) of chemical addition, and final effluent.

- Chemical feed lines (i.e. metal salts) shall be furnished to each reactor, aerobic digester and dewatering supernatant streams as necessary. Metal salts shall be added to each reactor during the React phase of the cycle.

- pH monitoring of the biological reactor is required when adding metal salts.

**Equipment**

- The basin dimensions reported on the design have been assumed based upon the required volumes and assumed basin geometry. Actual basin geometry may be circular, square, rectangular or sloped with construction materials including concrete, steel or earthen.

- Rectangular or sloped basin construction with length to width ratios greater than 1.5:1 may require alterations in the equipment recommendation.

- The basins and/or basin modifications are not included and shall be provided by others.

- Influent is assumed to enter the reactor above the waterline, located appropriately to avoid proximity to the decanter, splashing or direct discharge in the immediate vicinity of other equipment.

- If the influent is to be located submerged below the waterline, adequate hydraulic capacity shall be made in the headworks to prevent backflow from one reactor to the other during transition of influent.

- Scope of supply includes freight, installation supervision and start-up services.

- The control panel does not include motor starters or VFDs, which should be provided in a separate MCC (by others).

- Equipment selection is based upon Aqua Aerobic Systems’ standard materials of construction and electrical components.

- Aqua-Aerobic Systems, Inc. is familiar with various “Buy American” Acts (i.e. AIS, ARRA, Federal FAR 52.225, EXIM Bank, USAid, PA Steel Products Act, etc.). As the project develops Aqua-Aerobic Systems can work with you to ensure full compliance of our goods with various Buy American provisions if they are applicable/required for the project. When applicable, please provide us with the specifics of the project’s “Buy American” provisions.
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<td></td>
</tr>
<tr>
<td>Max Design Flow</td>
<td>= 5 MGD</td>
<td></td>
</tr>
<tr>
<td>Avg. Design Flow</td>
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</tr>
<tr>
<td>Max Design Flow</td>
<td>= 18927 m3/day</td>
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## DESIGN PARAMETERS

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<tr>
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<td>10</td>
<td>BOD5</td>
</tr>
<tr>
<td>Total Suspended Solids</td>
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<td>20</td>
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<tr>
<td>Total Kjeldahl Nitrogen</td>
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## SITE CONDITIONS

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<td>85 F</td>
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<tr>
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<td>68 F</td>
<td>25.0 C</td>
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<td>25.0 C</td>
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<td>No./Basin Geometry</td>
<td>Min</td>
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<td></td>
<td>Avg</td>
<td>= 16.2 ft = (4.9 m)</td>
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<td></td>
<td>Max</td>
<td>= 21.0 ft = (6.4 m)</td>
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<tr>
<td>Freeboard</td>
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<td>= 0.507 MG = (1,921.0 m³)</td>
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<tr>
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<td>Max</td>
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<tr>
<td>Diameter of Basin</td>
<td>Min</td>
<td>= 35.0 ft = (11.6 m)</td>
</tr>
<tr>
<td></td>
<td>Avg</td>
<td>= 36.2 ft = (11.1 m)</td>
</tr>
<tr>
<td></td>
<td>Max</td>
<td>= 40.0 ft = (12.2 m)</td>
</tr>
</tbody>
</table>

- Number of Cycles: 5 per Day/Basin (advances cycles beyond MDF)
- Cycle Duration: 4.8 Hours/Cycle
- Food/Mass (F/M) ratio: 0.095 lbs. BOD5/lb. MLSS-Day
- MLSS Concentration: 4500 mg/l @ Min. Water Depth
- Hydraulic Retention Time: 1.015 Days @ Avg. Water Depth
- Solids Retention Time: 12.6 Days
- Est. Net Sludge Yield: 0.778 lbs. WAS/lb. BOD5
- Est. Dry Solids Produced: 4539.4 lbs. WAS/Day = (2059.1 kg/Day)
- Est. Solids Flow Rate: 200 GPM (54417 GAL/Day) = (206.0 m³/Day)
- Decant Flow Rate @ MDF: 3472.0 GPM (as avg. from high to low water level) = (219.0 l/sec)
- LWL to CenterLine Discharge: 2.1 ft = (0.6 m)
- Lbs. O2/lb. BOD5: 1.25
- Lbs. O2/lb. TKN: 4.60
- Actual Oxygen Required: 10021 lbs./Day = (4545.7 kg/Day)
- Air Flowrate/Basin: 1567 SCFM = (44.4 Sm3/min)
- Max. Discharge Pressure: 10.7 PSIG = (74 KPA)
- Avg. Power Required: 2424.6 KW-Hrs/Day
### Aerobic Digester - Design Summary

#### Aerobic Digester Design Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sludge Flowrate to the Digester</td>
<td>54,460.0 gal/day (206.2 m³/day)</td>
</tr>
<tr>
<td>Inlet Sludge Concentration</td>
<td>1.00%</td>
</tr>
<tr>
<td>Solids Loading to the Digester</td>
<td>4,542.0 lb/day (2,060.2 kg/day)</td>
</tr>
<tr>
<td>Inlet Volatile Solids Fraction</td>
<td>72.6%</td>
</tr>
</tbody>
</table>

#### Aerobic Digester Basin Design Values

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No./Basin Geometry</td>
<td>2 Circular Basin(s)</td>
</tr>
<tr>
<td>Diameter of Basin</td>
<td>50 ft (15.2 m)</td>
</tr>
<tr>
<td>Min. Water Depth</td>
<td>14.7 ft (4.5 m)</td>
</tr>
<tr>
<td>Max. Water Depth</td>
<td>21 ft (6.4 m)</td>
</tr>
<tr>
<td>Min. Basin Vol. Basin</td>
<td>215,898.1 gal (817.3 m³)</td>
</tr>
<tr>
<td>Max. Basin Vol. Basin</td>
<td>308,425.9 gal (1,167.6 m³)</td>
</tr>
</tbody>
</table>

#### Aerobic Digester Process Design Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solids Retention Time</td>
<td>22.7 days</td>
</tr>
<tr>
<td>Digester Design Temperature</td>
<td>25 C</td>
</tr>
<tr>
<td>Volatile Solids Destruction</td>
<td>41.5%</td>
</tr>
<tr>
<td>Digester Solids Concentration</td>
<td>2%</td>
</tr>
<tr>
<td>Oxygen Supplied for Digestion</td>
<td>2.00 lbs O₂ per lb VSS Destroyed</td>
</tr>
<tr>
<td>Oxygen Distribution Per Basin</td>
<td>50.0%</td>
</tr>
<tr>
<td>Actual Oxygen Required</td>
<td>2,736.9 lb/day (1,241.4 kg/day)</td>
</tr>
<tr>
<td>Volatile Percentage After Digestion</td>
<td>60.8%</td>
</tr>
<tr>
<td>Estimated Dry Solids to be Removed</td>
<td>3,173.5 lb/day (1,439.5 kg/day)</td>
</tr>
<tr>
<td>Volume of Solids to be Removed</td>
<td>19,025.9 gal/day (72.02 m³/day)</td>
</tr>
<tr>
<td>Estimated Supernatant Volume</td>
<td>92,528.6 gal/basin (350.26 m³/basin)</td>
</tr>
<tr>
<td>Assumed Supernatant Duration</td>
<td>180 minutes</td>
</tr>
<tr>
<td>Calculated Supernatant Flow</td>
<td>514.0 gpm (32.4 l/sec)</td>
</tr>
</tbody>
</table>

1. The Volatile Solids Destruction listed above shall be used for determination of the oxygen demand during summer conditions. It should be noted that the actual VSS destruction will be dependant upon digester inlet condition, temperature, and operating conditions.

2. The Digester Solids Concentration is reflected as an average concentration, assuming the operations include frequent settling and supernating practices.

#### Aerobic Digester Equipment Criteria

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCFM Required for O₂ Demand</td>
<td>627/basin (1,065 m³/hr/basin)</td>
</tr>
<tr>
<td>Max. Discharge Pressure</td>
<td>9.67 PSIG (66.72 KPA)</td>
</tr>
<tr>
<td>Mixing Energy with DDMs</td>
<td>40 HP/MSG (7.88 W/m³)</td>
</tr>
<tr>
<td>NPHP Provided</td>
<td>15 (11.2 kW)</td>
</tr>
<tr>
<td>Max. Flow Rate Required Basin</td>
<td>200 gpm (0.757 m³/min)</td>
</tr>
<tr>
<td>Avg. Power Required</td>
<td>1,427.31 kW·hr/day</td>
</tr>
</tbody>
</table>
Exhibit F:
Alkalinity Addition Calculations
**Alkalinity Requirement Calculation**

Given:
- Design Flow (Q) = 1.00 MGD
- Influent Alkalinity Conc. (ALKi) = 150 mg/l
- Influent TKN Conc. (TKNi) = 40 mg/l

Assume:
- Waste biosolids contain (%N) = 10% N
- Alkalinity req'd for Nitrification (ALK-N) = 7.1 mg/l alkalinity per 1 mg/l nitrate generated

**Nitrification capability:**
- Total TKN oxidized to nitrate (TKNoN) = TKNi - (%N x ALKi) = 25 mg/l
- Alkalinity req'd for nitrification (ALKrN) = (TKNoN) x (ALK-N) = 177.5 mg/l
- Remaining Alkalinity (ALKr) = (ALKi) - (TKNoN) = -27.5 mg/l
- Alkalinity req'd as buffer = 50-60 mg/l
- Additional Alkalinity Req'd = 77.5 mg/l (as CaCO3)

**Chemical addition**

For Alum: 0.5 mg/l of alkalinity will be utilized for every mg/l alum added

Alum Addition = 155 mg/l alum

Dosage in lb/MG per ppm of alkalinity reqd

\[
\text{Dosage in lb/MG/ppm} = \frac{\text{lb/MG/ppm alkalinity}}{\frac{\text{MW(chemical used)}}{\text{MW(CaCO3)} \times 1000}}
\]

\[
\text{Dosage in lb/day for average daily flow} = \text{Dosage in lb/MG/ppm alkalinity} \times (\text{Additional Alkalinity Req'd}) \times (\text{Average daily flow})
\]

<table>
<thead>
<tr>
<th>Chemical Addition</th>
<th>Molecular Weight (MW)</th>
<th># MW in Molecular Formula</th>
<th>lb/MG/ppm alkalinity</th>
<th>Dosage (lb/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium carbonate</td>
<td>CaCO3</td>
<td>100.0869</td>
<td>1</td>
<td>8.333</td>
</tr>
<tr>
<td>Lime</td>
<td>Ca(OH)2</td>
<td>74.0933</td>
<td>1</td>
<td>6.169</td>
</tr>
<tr>
<td>Caustic Soda</td>
<td>NaOH</td>
<td>39.997</td>
<td>2</td>
<td>6.660</td>
</tr>
<tr>
<td>Soda Ash</td>
<td>Na2CO3</td>
<td>105.9888</td>
<td>1</td>
<td>8.825</td>
</tr>
<tr>
<td>Sodium bicarbonate</td>
<td>NaHCO3</td>
<td>84.007</td>
<td>2</td>
<td>13.989</td>
</tr>
<tr>
<td>Magnesium Hydroxide</td>
<td>Mg(OH)2</td>
<td>58.3197</td>
<td>1</td>
<td>4.856</td>
</tr>
</tbody>
</table>

**Magnesium Hydroxide:**
- Aqueous Suspension Mg(OH)2, Contained = 7.7 lb/ gal
- Liquid Feed Rate = 49 gpd

Magnesium Hydroxide will be utilized for alkalinity addition. It is estimated that 49 gpd will be required during average daily flow.
**FloMag® H**
**Magnesium Hydroxide Slurry for Wastewater Treatment**

**DESCRIPTION**
FloMag H is a concentrated, stabilized aqueous suspension of magnesium hydroxide with excellent flow and storage properties.

**USES**
FloMag H is used in wastewater treatment for acid neutralization, biological wastewater, and heavy metal removal, sugar and chemical processing, and other industrial applications.

**CHEMICAL AND PHYSICAL PROPERTIES**

<table>
<thead>
<tr>
<th>Property</th>
<th>Typical</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aqueous Suspension</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dry Solids, %</td>
<td>60.0</td>
<td>58.5 min.</td>
</tr>
<tr>
<td>Bulk Density, lb/gal</td>
<td>12.8</td>
<td>12.6 min.</td>
</tr>
<tr>
<td>Mg(OH)₂ Contained, lb/gal</td>
<td>7.7</td>
<td></td>
</tr>
<tr>
<td>Viscosity, (Brookfield VT, 100 rpm), cps</td>
<td>200</td>
<td>70 - 600</td>
</tr>
<tr>
<td>Freeze Point, °C</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

**Dry Solids Basis**

<table>
<thead>
<tr>
<th>Property</th>
<th>Typical</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mg(OH)₂ %</td>
<td>98.8</td>
<td>98.5 min.</td>
</tr>
<tr>
<td>CaO, %</td>
<td>0.6</td>
<td></td>
</tr>
<tr>
<td>Median Particle Size, microns</td>
<td>3.0</td>
<td></td>
</tr>
<tr>
<td>% Passing 325 mesh</td>
<td>99.8</td>
<td>99.0 min.</td>
</tr>
</tbody>
</table>

**EQUIVALENTS**

<table>
<thead>
<tr>
<th>Equivalents</th>
<th>Dry Solids Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caustic Soda (NaOH)</td>
<td>1 lb Equivalent to 0.73 lb Mg(OH)₂</td>
</tr>
<tr>
<td>Soda Ash (Na₂CO₃)</td>
<td>1 lb Equivalent to 0.55 lb Mg(OH)₂</td>
</tr>
<tr>
<td>Lime (CaO), (Typical 94%)</td>
<td>1 lb Equivalent to 0.98 lb Mg(OH)₂</td>
</tr>
</tbody>
</table>

**PACKAGING**
Martin Marietta Magnesia Specialties offers its magnesium hydroxide slurry products in bulk shipments (railcar and truck) only. Tote and drum quantities can be supplied by Martin Marietta authorized distributors.

**STORAGE**
Mild steel vessels. Extended storage requires intermittent agitation and freeze protection.

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**NOTICE:** The information contained herein is, to the best of our knowledge and belief, accurate. Any recommendations or suggestions made are without warranty or guarantee of results since conditions of handling and use are beyond our control; we therefore assume no liability for loss or damage incurred by following these suggestions. Seller warrants only that this product will meet the specifications set forth. Any other representation or warranty, either express or implied, is specifically disclaimed including warranties of fitness for a particular purpose and/or merchantability. Sellers and manufacturers only obligation shall be to replace such quantity of the product proved to be defective. Before using, user shall determine the suitability of the product for the intended application and user assumes all risk and liability whatsoever in connection therewith. Neither seller nor manufacturer shall be liable in tort, contract or under any theory for any loss or damage, incidental or consequential, arising out of the use of or the inability to use the product.
Exhibit G: 
Phosphorus Removal Calculations
Phosphorus Removal using PACI

ADF = 1 MGD
Influent P = 8 mg/l
Influent BOD = 300 mg/l
Desired Effluent P = 1 mg/l
Yield Coefficient (Y) = 0.78 (assumed)
TP conc in WAS = 3% (assumed)

Phosphorus removal through biological biomass uptake

Typical P uptake of influent BOD during treatment should attain an effluent Total P

\[ \text{Daily WAS Flow} = \frac{M(BOD)}{(Q)(t)(IB-OB)(t)(Y)*(8.34 \text{ lb/gal})} \]

Daily WAS Flow = 1,952 lb BOD/day
Phosphorus Removal = \( \frac{\text{Daily WAS} \times \%\text{TP}}{8.34 \times Q} \)
Phosphorus Removal = 7.02 mg/L

Remaining P after biological uptake

Remaining P = (Influent P) - (P removed) = 1.0 mg/l
Assume P to ensure adequate equipment sizing = 3.0 mg/l

Chemical Dosage

P to treat = \( \frac{\text{P treat} \times 1 \text{ MGD} \times 8.34}{25.0 \text{ lb/day total P}} \) = 42.5 lb Al/day

Check % total P removal to determine appropriate Al dose rate
Reference: AWWA 8408-03
Assume Al:P = 1.7 :1

Al dosage = (p treat) * ratio = 42.5 lb Al/day

Polyaluminum chloride products vary in amounts PACI.
The range of PACI content for percent by weight Al is 2.5% to 13%

Dosing of PACI at alum dosage:
- 2.5% = 1,701 lb PACI /day
- 13.0% = 327 lb PACI /day

PACI products have specific gravities that range from 1.15 to 1.38
Specific gravity = 1.15 PACI weight = 9.6 lb/gal PACI
Specific gravity = 1.38 PACI weight = 11.5 lb/gal PACI

PACI Dosage

Assume product used has the following characteristics:
Specific gravity = 1.19
% PACI in sol'n = 10%

MW of PACI = \( 2^*26.98+3^*16 = 101.96 \)
% Al in solution = \( .1^*2^*(26.98)/(101.96) = 5.29\% \)
Specific Weight = \( 8.34^*1.19 = 9.92 \text{ lb/gal PACI} \)

PACI weight dose = Al dosage * % Al = 804 lb/day PACI
PACI volume dose = PACI lb/day * SW = 81.0 gal/day PACI
Exhibit H:  
Post-Equalization (EQ) Basin Calculations
Equalization Basin Calculations

Vreq = (flow into Eq basin – flow out of Eq basin) *( tb - td )

**Phase 1**

Qin (Decant flow rate @ MDF) = 3,472 gpm  
Qout = 2.00 MGD = 1,389 gpm  
t_d (decant duration) = 72 min  
# Decants per day = 10 Decants per day  
t_b (time between decants) = 144 minutes

Vreq = (flow into Eq basin – flow out of Eq basin) *( tb - td )
Volume required = 149,984 gallons  
20,051 ft³

**Phase 2**

Qin (Decant flow rate @ MDF) = 3,472 gpm  
Qout = 4.00 MGD = 2,778 gpm  
t_d (decant duration) = 72 min  
# Decants per day = 20 Decants per day  
t_b (time between decants) = 72 minutes

Vreq = (flow into Eq basin – flow out of Eq basin) *( tb - td )
Volume required = 0 gallons  
0 ft³

Phase 1 requirements determine the size of the post-EQ basin

149,984 gallons  
20,051 ft³

POST-EQ basin dimensions

Diameter = 50 ft  
Max Water Level = 17 ft

Total Volume = 33,379 ft³  
249,678 gallons

The Volume of the proposed Post-EQ basin is larger than the required volume; therefore, the post-EQ basin is adequately sized.
Exhibit I:
Disinfection Calculation
Chlorine Contact Chamber Calculation

**Phase 1.**
*(Flow from the post-EQ basin into the chlorine contact chambers)*

**PEAK FLOW RATE FROM POST-EQ BASIN**
- Peak Flow 1 Basin = 2.0 MGD
- Peak Flow 1 Basin = 1,389 gpm
- Minimum detention time = 30 minutes

**REQUIRED VOLUME for Peak Flow Rate**
\[ V_{req} = Q \cdot t_d \]
\[ 1,389 \times 30 = 41,667 \text{ gallons} \]

**DESIGN DIMENSIONS**
- Depth = 7 ft
- Number of Chambers = 2
- Footprint area / chamber = 530 ft^2
- Total footprint area = 530 x 2 = 1,060 ft^2
- Total Volume = 1,060 x 7 = 7,420 ft^3
- Total Volume = 7,420 x 7.48 = 55,502 gallons

**ACTUAL DETENTION TIME**
- \( t_d \) (Peak Flow) = \( 55,502 / 1,389 = 40.0 \text{ minutes} \)
- \( t_d \) (Average Flow) = \( 55,502 / 694.4 = 79.9 \text{ minutes} \)

DETENTION TIME with one chamber out of service
- \( t_d \) (Peak Rate) = \( 27,751 / 1,389 = 20.0 \text{ minutes} \)

**Phase 2.**
*(Flow from the post-EQ basin into the chlorine contact chambers)*

**PEAK FLOW RATE FROM POST-EQ BASIN**
- Peak Flow 1 Basin = 4.0 MGD
- Peak Flow 1 Basin = 2,778 gpm
- Minimum detention time = 30 minutes

**REQUIRED VOLUME for Average Decant Rate**
\[ V_{req} = Q' \cdot t_d \]
\[ 2,778 \times 30 = 83,333 \text{ gallons} \]

**DESIGN DIMENSIONS**
- Depth = 7 ft
- Number of Chambers = 4
- Footprint area / chamber = 530 ft^2
- Total footprint area = 530 x 4 = 2,120 ft^2
- Total Volume = 2,120 x 7 = 14,840 ft^3
- Total Volume = 14,840 x 7.48 = 111,003 gallons

**ACTUAL DETENTION TIME**
- \( t_d \) (Peak Flow) = \( 111,003 / 2,778 = 40.0 \text{ minutes (minimum 30 minutes)} \)
- \( t_d \) (Average Flow) = \( 111,003 / 1,389 = 79.9 \text{ minutes} \)

DETENTION TIME with one chamber out of service
- \( t_d \) (Peak Rate) = \( 83,252 / 2,778 = 30.0 \text{ minutes (minimum 15 minutes)} \)
Disinfection Chlorination Feed Rate Calculation

Phase 1
Design Q = 1.000 MGD
Peak Q = 2.000 MGD

Phase 2
Design Q = 2.000 MGD
Peak Q = 4.000 MGD

Chlorination:
Chlorination feed rate = 6.0 mg/L (Typical per McGraw-Hill Water and Wastewater Calculations)

Sodium hypochlorite feed solution = 12.5% chlorine

Dosage of chlorine = $Q \times D \times 8.34$ = lb/d of chlorine

Weight Dosage of sodium hypochlorite = (lb/d of chlorine)/(% chlorine in sh) = lb/d of sodium hypochlorite

Assume 1 lb of chlorine (100%, gas) = 1 gal of 12.5% sodium hypochlorite

Volume Dosage of sodium hypochlorite = (lb/d of sodium hypochlorite)/(8.34) = gpd of sodium hypochlorite

Dosage of sodium hypochlorite

Dosage of sodium hypochlorite = Flow*Dosage*8.34/PercSoln/8.34

Phase 1
Design Q = 48.0 gpd sodium hypochlorite
Peak Q = 96.0 gpd sodium hypochlorite

Phase 2
Design Q = 96.0 gpd sodium hypochlorite
Peak Q = 192.0 gpd sodium hypochlorite
**Dechlorination:**
To neutralize 1 mg/L of chlorine, it takes 1.2 lb sodium bisulfate (sbs) per 100,000 gal of water

Assume total residual chlorine (TRC) = 1 mg/L

The solution being used is 40% available

<table>
<thead>
<tr>
<th>lb sbs</th>
<th>sol'n</th>
<th>TRC</th>
<th>% sbs</th>
<th>lb sol'n</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2</td>
<td></td>
<td>0.4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Dosage for liquid sodium bisulfite sol'n (D) = 3.00 lb sbs sol'n per 100,000 gal of water

Dosage Sol'n = \( Q \times \frac{D}{8.34} \) = gpd of sodium bisulfite

<table>
<thead>
<tr>
<th>Q</th>
<th>100,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.0</td>
<td>1,000,000</td>
</tr>
</tbody>
</table>

\( \frac{8.34}{\text{mg water} / \text{gal}} \times \frac{1,000}{\text{gal}} = \text{gpd of liquid sodium bisulfite sol'n} \)

Dosage of liquid sodium bisulfite sol'n

**Phase 1**
- Design Q = 3.60 gpd liquid sodium bisulfite sol'n
- Peak Q = 7.19 gpd liquid sodium bisulfite sol'n

**Phase 2**
- Design Q = 7.19 gpd liquid sodium bisulfite sol'n
- Peak Q = 14.39 gpd liquid sodium bisulfite sol'n

*Note: Operators specify that the feed rate of sodium bisulfite is often the same as the feed rate of sodium hypochlorite.*
Exhibit J:  
Cascade Step Aeration Calculation
Cascade Step Aeration Calculations

Required Height Fall, H, feet

\[
H = \frac{(R-1)}{[0.11 \ a \ b \ (1+0.046T)]}
\]

\(R = \text{Deficit Ratio} = \frac{[C_s - C_o]}{[C_s - C]}\)

\(Cs = \text{DO saturation concentration of wastewater at temperature } T, \text{ mg/L}\)

\(Co = \text{DO concentration prior to aeration, mg/L}\)

\(C = \text{Required final DO level in effluent, mg/L}\)

\(a = 0.8\)

\(b = 1.1 \text{ weir geometry parameter, for steps, } b = 1.1\)

\(T = \text{water temperature, °C}\)

\(H = \text{height through which water falls, ft}\)

\(T_{\text{max}}, \text{ °C} = 28 \ (82 \text{ ° F})\)

\(Cs, \text{ mg/l} = 7.81\)

\(Co, \text{ mg/L (assumed)} = 1\)

\(C, \text{ mg/L} = 5\)

\(R, \text{ Deficit Ratio} = 2.42\)

\[
H = \frac{(R-1)}{[0.11 \ a \ b \ (1+0.046T)]}
\]

\(H, \text{ ft} = 6.4 \quad 77.13 \text{ inches}\)

Typical Design information for a cascade-type post-aeration system

Hydraulic loading rate at average design flow = 100,000-500,000 gpd/ (ft of width)

Step Dimensions

- Height = 6-12 inches
- Length = 12-24 inches
- Cascade height = 6-16 feet

Design Dimensions

- Width = 10 ft
- Step Height = 10 inches
- Total Steps = 8
- Total Height = 6.67 ft

- HLR (1.0 MGD) = 100,000 gpd/ (ft of width)
- HLR (2.0 MGD) = 200,000 gpd/ (ft of width)
- HLR (5.0 MGD) = 500,000 gpd/ (ft of width)

Exhibit K:
Sludge Digester Calculations
SLUDGE DIGESTER CALCULATIONS

Flow (Q) = 1 MGD
Influent BOD (IB) = 350 mg/L
Effluent BOD (OB) = 10 mg/L

Assume:
Yield Coefficient (Y) = 0.81
Sp.gr. of sludge = 1.0
sludge conc. % solids = 2%

Expected sludge production = (Q)*(IB-OB)*(Y)*(8.34) =
2,297 lb WAS/day

Flow of wet sludge = sludge production WAS / [(2%) * 8.34] =
13,770 gall/d WAS

Sizing of digesters
Diameter = 50 ft
Depth = 21 ft
Volume of each digester = 41,233 c.f. (1 digester for Phase 1, 2 for Phase 2)
Volume (gal) = 308,467 gallons

Detention Time
SRT = volume(gal) / flow sludge(gpd) =
22.40 days

Energy Requirement:
from Metcalf and Eddy, Wastewater Engineering, p 1536
Diffused air mixing = 20-40 c.f./min. per 1000 c.f.
Air supply = 30 c.f./min. per 1000 c.f.
Air req’d = (air supply) * (Volume) = 1,237.00 ft³/min
HP = (Air req’d)(5 lb/sq.in.)(144 sq.in./s.f.)/33,000 ft-lb/min/HP) = 27.0 HP
Assume 70% efficiency = HP / 0.7 = 38.6 HP
SLUDGE DIGESTER CALCULATIONS

Total Flow = 5 MGD
Number of Digesters = 3
Flow per digester (Q) = 1.67 MGD
Influent BOD (IB) = 350 mg/L
Effluent BOD (OB) = 10 mg/L

Assume:
Yield Coefficient (Y) = 0.81
Sp.gr. of sludge = 1.0
sludge conc. % solids = 2%

Expected sludge production = (Q)*(IB-OB)*(Y)*(8.34) = 3,828 lb WAS/day

Flow of wet sludge = sludge production WAS / [(2%) * 8.34] = 22,950 gall/d WAS

Sizing of digesters
Diameter = 50 ft
Depth = 21 ft
Volume of each digester = 41,233 c.f. (1 digester for Phase 1, 2 for Phase 2)
Volume (gal) = 308,467 gallons

Detention Time
SRT = volume(gal) / flow sludge(gpd) = 13.44 days

Energy Requirement:
from Metcalf and Eddy, Wastewater Engineering, p 1536
Diffused air mixing = 20-40 c.f./min. per 1000 c.f.
Air supply = 30 c.f./min. per 1000 c.f.
Air req’d = (air supply) * (Volume) = 1,237.00 ft3/min
HP = (Air req’d)(5 lb/sq.in.)(144 sq.in./s.f.)/33,000 ft-lb/min/HP = 27.0 HP
Assume 70% efficiency = HP / 0.7 = 38.6 HP
Exhibit L:
Sludge Dewatering Calculation
**Sludge Dewatering Calculation**

Sludge Flowrate from Digester = 13,770 gpd (from sludge digester calculation)

Production over a week = 96,390 gallons

Number of production days/week = 2 days per week

Dewatering flow for production day = 48.195 gpd at 2 days per week

Assumed hours production = 6 hours per day at 2 days per week

Required belt press performance rate = 134 gpm

For Phase 2, the belt press will be run 4 days per week.

**Select Belt Filter Press**

Select Charter Machine Company Belt Press Filter Model TP17.43 (width = 1.5 meter)

Production ability for aerobically digested sludge = 170 gpm

Sludge Flowrate from Digester = 13,770 gpd

Production over a week = 96,390 gallons

Assumed hours production = 6 hours per day

Actual required number of days of operation = 1.58 days per week (Phase 1)
Charter Machine Company

Projected Performance
Residuals/Biosolids Dewatering
Belt Filter Press Model TP Series 43

The following data is intended as an estimating guide only. The listed performance values are the results of a combination of actual installations, on-site demonstrations and laboratory bench tests. Dewatering of Residuals/Biosolids is far from an exact science. We make no statement of warranty that actual machine performance will comply with the anticipated performance as listed. Performance warranty must be supported by laboratory bench testing of the representative residuals/biosolids.

**THROUGHPUT:**
POUNDS DRY SOLIDS PER HOUR
GALLONS PER MINUTE
(CALCULATED AT MID RANGE FEED %)

<table>
<thead>
<tr>
<th>SLUDGE TYPE</th>
<th>FEED %</th>
<th>CAKE %</th>
<th>FILTRATE CAPTURE %</th>
<th>POLYMER CONSUMP. LBS/TON</th>
<th>TP12.43 LBS/DS/H GPM</th>
<th>TP17.43 LBS/DS/H GPM</th>
<th>TP22.44 LBS/DS/H GPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRIMARY</td>
<td>4-8</td>
<td>28-40</td>
<td>96</td>
<td>2-8</td>
<td>2,400</td>
<td>3,600</td>
<td>5,100</td>
</tr>
<tr>
<td>ANAEROBICALLY DIGESTED</td>
<td>2-5</td>
<td>17-27</td>
<td>96</td>
<td>6-10</td>
<td>1,400</td>
<td>2,100</td>
<td>3,000</td>
</tr>
<tr>
<td>50% PRIMARY</td>
<td>3-6</td>
<td>20-34</td>
<td>96</td>
<td>6-10</td>
<td>1,800</td>
<td>2,900</td>
<td>4,050</td>
</tr>
<tr>
<td>50% SECONDARY</td>
<td>3-6</td>
<td>20-34</td>
<td>96</td>
<td>6-10</td>
<td>1,800</td>
<td>2,900</td>
<td>4,050</td>
</tr>
<tr>
<td>WASTE ACTIVATED</td>
<td>.5-1.5</td>
<td>16-21</td>
<td>97</td>
<td>8-12</td>
<td>800</td>
<td>1,050</td>
<td>1,500</td>
</tr>
<tr>
<td>AEROBICALLY DIGESTED</td>
<td>1-2</td>
<td>14-19</td>
<td>98</td>
<td>10-14</td>
<td>750</td>
<td>1,280</td>
<td>1,650</td>
</tr>
<tr>
<td>ALUM</td>
<td>1.5-2</td>
<td>16-24</td>
<td>96</td>
<td>8-16</td>
<td>700</td>
<td>960</td>
<td>1,400</td>
</tr>
<tr>
<td>PHARMACEUTICAL</td>
<td>3-5</td>
<td>20-32</td>
<td>96</td>
<td>8-12</td>
<td>1,400</td>
<td>1,800</td>
<td>3,000</td>
</tr>
<tr>
<td>SAND/GRAVEL</td>
<td>25-35</td>
<td>70-77</td>
<td>95</td>
<td>1.5-2.5</td>
<td>12,000</td>
<td>15,000</td>
<td>24,000</td>
</tr>
<tr>
<td>COAL</td>
<td>20-40</td>
<td>62-70</td>
<td>94</td>
<td>1.5-3</td>
<td>12,500</td>
<td>18,000</td>
<td>30,000</td>
</tr>
<tr>
<td>PULP/PAPER</td>
<td>1.2-6</td>
<td>30-36</td>
<td>98</td>
<td>.7-4</td>
<td>3,060</td>
<td>4,680</td>
<td>6,300</td>
</tr>
</tbody>
</table>

*GPM = gallons per minute*
NOTE: MINIMUM 20 GPM @ 30 PS1
WATER SUPPLY REQUIRED

CONTROL PANEL

POLYMER SOLUTION DISCHARGE

FLOW SENSOR

CHECK VALVE

POST DILUTION INLINE MIXER

FLOW METER

1/2" DIA MOUNTING HOLE 4 PLACES

1 1/2"

24 7/8"

11 3/8"

1" NPT WATER INLET

PRESSURE REGULATOR

SOLENOID VALVE

KINETIC MIXER

POST DILUTION FLOW METER

METERING PUMP

PLAN VIEW

CHARTER MACHINE COMPANY
55 WESTER AVE METUCHEN N.J. 08840

TOLERANCES UNLESS OTHERWISE SPECIFIED
FRACTIONAL Dim ±1/64
DECIMAL Dim ±1/10
ANGLE ±1/2
SURFACE FINISH 125

DRAWN
APPROVED

REV

SIZE
DWG NO.

1" = 1'-0"
SHEET 1 OF 1
LOCATION OF 1 1/2" NPT PLANT WATER CONNECTION FOR BELT WASH SYSTEM VARIES ACCORDING TO LOCATION OF WASH WATER BOOSTER PUMP AND USE OF OPTIONAL WASH WATER RECYCLE.

CONTRACTOR TO PROVIDE 2 TO 3 ADDITIONAL POLYMER INJECTION PORTS. LOCATION OF ADDITIONAL INJECTION POINTS TO BE SPECIFIED BY ENGINEER.

DRY WEIGHT - 20,000 LBS
WET WEIGHT - 21,750 LBS
THE 22" PRESSURE ROLL (< 1000LBS) IS THE SINGLE HEAVIEST ITEM, EXCLUDING THE FRAME.
Exhibit M:
Calculations for
Phase 3 SBRs conversion to Clarifiers
Claroher Design Calculations

**Conversion of SBRs to clarifiers**

- **Average Daily Flowrate (GPD)** = 5,000,000
- **Number of Clarifiers** = 4
- **ADF per Clarifier (GPD)** = 1,250,000
- **Peak Factor** = 2.0
- **Q = Peak Hourly Flowrate (GPD)** = 2,500,000
- **RAS (lowest range)** = 100%
- **RAS (highest range)** = 200%
- **RAS (average)** = 150%
- **Q_{RAS} = RAS Average Flowrate** = 1,875,000
- **X = MLSS Concentration (mg/L)** = 4,400
- **Side Water Depth (ft)** = 16

**Equations:**

- **Surface Loading Rate** = \( \frac{Q \text{ (GPD Peak)}}{\text{Surface Area of Clarifier}} \)
- **Surface Area of Clarifier** = \( \pi (\text{Clarifier radius})^2 \)
- **Detention Time** = \( \frac{\text{Tank Volume} \times 24 \text{ hrs}}{Q \text{ (GPD Peak)}} \)
- **Tank Volume** = \( \pi (\text{Clarifier radius})^2 \times \text{Side Water Depth} \times 7.48 \text{ gal/ft}^3 \)
- **Weir Overflow Rate** = \( \frac{Q \text{ (GPD Peak)}}{\text{Total Feet of Weir}} \)
- **Total Feet of Weir** = \( \pi (\text{Clarifier Diameter}) \)
- **Solids Loading Rate** = \( \frac{8.34 \times (Q \text{ (MGD)} + Q_{RAS} \text{ (MGD)}) \times X}{\text{Surface Area of Clarifier}} \)

**Clarifier Design**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clarifier Diameter (ft)</td>
<td>73</td>
</tr>
<tr>
<td>Side Water Depth (ft)</td>
<td>16</td>
</tr>
<tr>
<td>Surface Area of Clarifier ('t²)</td>
<td>4,185.39</td>
</tr>
<tr>
<td>Tank Volume (gal)</td>
<td>500,907.09</td>
</tr>
<tr>
<td>Total Feet of Weir (ft)</td>
<td>229.34</td>
</tr>
<tr>
<td>Surface Loading Rate at ADF (gpd/ft²)</td>
<td>298.66</td>
</tr>
<tr>
<td>Surface Loading Rate at peak (gpd/ft²)</td>
<td>597.32</td>
</tr>
<tr>
<td>Detention Time (hrs)</td>
<td>4.81</td>
</tr>
<tr>
<td>Weir Overflow Rate (gpd/ft)</td>
<td>10,901.02</td>
</tr>
<tr>
<td>Solids Loading Rate</td>
<td></td>
</tr>
<tr>
<td>@ 100% RAS (lb/day*ft²)</td>
<td>21.92</td>
</tr>
<tr>
<td>@ 200% RAS (lb/day*ft²)</td>
<td>32.88</td>
</tr>
<tr>
<td>@ 150% RAS (lb/day*ft²)</td>
<td>27.40</td>
</tr>
</tbody>
</table>

**Desired Range:**

- **400-700 gpd/ft²** avg. & Less than **1,200 gpd/ft²** peak
- **2-3 hrs**
- **Less than 30,000 gpd/ft**
- **25-35 lb/(day*ft²)**
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Barrow County Tanner's Bridge Qualifluent
5.0 MGD Water Reclamation Facility
Design Development Report
October 15, 2008
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Section 3.0  Facility Assessment

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Section 1.0 Introduction

The primary service area for the Tanners Bridge Water Reclamation Facility is the northwest, west, and southwest area of Barrow County as shown in Figure 1. A portion of this existing service area is currently being served by the 0.5 MGD Tanners Bridge LAS Facility which will be decommissioned when the new NPDES facility begins service. The existing operational pond will be utilized in the new design as a post reject pond. EPD has authorized a 5.0 MGD wasteload allocation for an NPDES discharge to the Apalachee River to replace the existing LAS system (see Figure 3). The schedule for this project anticipates start-up of the facility on or about December 30, 2010. The project will be municipal with Barrow County owning and operating the facility.

This Design Development Report (DDR) is being submitted in accordance with Georgia EPD requirements to accomplish the following:

1. Provide a description of the physical characteristics for the proposed treatment site, and discharge to the Apalachee River.

2. Propose a treatment alternative that will conform to the wasteload allocation authorized by EPD.

The development area to be served currently has a partially completed area sewer collection system. The area is and will be a mixture of mature and new development. New development as well as Barrow County Capital Improvement projects will be required to provide additional collection infrastructure.

Barrow County operates an 8.0 MGD wholesale and retail potable water supply system utilizing water produced at the Bear Creek Water Treatment Facility. In addition, potable water is supplied to large areas of the County by the City of Winder which operates a 5.0 MCD surface water plant.

The wastewater influent flow is entirely municipal with both residential and commercial components.
Two alternate technologies have been considered for this facility:

1. Advanced activated sludge using "Vertical Loop" aeration technology with phosphorous removal (both biological and chemical).
2. Membrane technology to accomplish the same results as the classical activated sludge facility.

The decision to build a classical advanced activated sludge facility was made for two reasons, reliability and cost. Membrane technology is new and largely unproven on a long term basis. Oxidation ditch technology has been used across the United States for many years and is a highly reliable and proven technology.

Recent cost for membrane plants in the 5.0 MGD size range is approximately $12.00/gallon or $60,000,000 for a 5.0 MGD facility. The Qualifluent advanced activated sludge facility selected for this project is projected to cost approximately $20,000,000.

The selected process also has odor control as a standard feature.

This project is to be funded by revenue bonds issued by Barrow County.

Section 2.0 Site Description

The proposed Tanners Bridge service area is located in Barrow County, Georgia, in the northwest, west, and southwest portions of the County. This area is in the north-central part of Georgia and is entirely in the southern Piedmont Major Land Resource Area as described by the Soil Conservation Service. Granite, gneiss, schist, and other metamorphic rocks generally underlie the geology of Barrow County. The elevation of the plant site is 842 feet above sea level.

The climate for this area of Barrow County is temperate. The summers are warm, winters are moderately cold, and precipitation is normally adequate. Table 1 describes the average temperatures and precipitation values as provided by WEATHER.COM for the period January, 2005 through December, 2005.
**FIGURE 3**

*Proposed Barrow County-Tanners Bridge Wasteload Allocation*

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Annual Permit Limitations (L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow, MGD</td>
<td>5.0</td>
</tr>
<tr>
<td>5-Day Biochemical Oxygen Demand (BOD$_5$), mg/l</td>
<td>10</td>
</tr>
<tr>
<td>Total Suspended Solids (TSS), mg/l</td>
<td>20</td>
</tr>
<tr>
<td>Ammonia Nitrogen (NH$_3$-N), mg/l</td>
<td>2.0</td>
</tr>
<tr>
<td>Total Phosphorus (as P), mg/l</td>
<td>1.0</td>
</tr>
<tr>
<td>Ortho-Phosphorus</td>
<td>Monitor</td>
</tr>
<tr>
<td>Fecal Coliform Bacteria, MPN/100 ml</td>
<td>200</td>
</tr>
<tr>
<td>Dissolved Oxygen (DO) (minimum), mg/l</td>
<td>5.0</td>
</tr>
<tr>
<td>Total Residual Chlorine (TRC), (daily max.), mg/l</td>
<td>0.017</td>
</tr>
<tr>
<td>pH, Standard Units</td>
<td>6.0 - 9.0</td>
</tr>
</tbody>
</table>

1. Values are monthly averages except as noted.
Table 1
Temperature and Precipitation

January, 2007 through December, 2007

<table>
<thead>
<tr>
<th>Month</th>
<th>Temperature</th>
<th>Precipitation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average Daily Maximum °F</td>
<td>Average Daily Minimum °F</td>
</tr>
<tr>
<td>January</td>
<td>52</td>
<td>31</td>
</tr>
<tr>
<td>February</td>
<td>57</td>
<td>33</td>
</tr>
<tr>
<td>March</td>
<td>66</td>
<td>40</td>
</tr>
<tr>
<td>April</td>
<td>74</td>
<td>47</td>
</tr>
<tr>
<td>May</td>
<td>81</td>
<td>55</td>
</tr>
<tr>
<td>June</td>
<td>87</td>
<td>62</td>
</tr>
<tr>
<td>July</td>
<td>89</td>
<td>66</td>
</tr>
<tr>
<td>August</td>
<td>88</td>
<td>66</td>
</tr>
<tr>
<td>September</td>
<td>83</td>
<td>60</td>
</tr>
<tr>
<td>October</td>
<td>74</td>
<td>49</td>
</tr>
<tr>
<td>November</td>
<td>65</td>
<td>41</td>
</tr>
<tr>
<td>December</td>
<td>55</td>
<td>34</td>
</tr>
</tbody>
</table>

Year 72.6 AVERAGE  48.7 AVERAGE  51.3 ANNUAL

Cooler weather begins to arrive by late September, and average daily temperatures drop by 20 degrees in the period from September to November. Freezing occurs on slightly more than half the days in the period of December through February in contrast to 1 in 4 days in November and March. The temperature generally warms to the mid 50's or higher in the winter months. In spring and summer, rainfall occurs mostly as showers and thundershowers. Cold-season rains result almost entirely from low-pressure storms and fronts. Normally 28 percent of the annual rainfall occurs in the spring, while slightly more than 27 percent in winter, with 27 percent in the summer, and 17 percent of the annual rainfall occurring in the fall. The wettest month is typically January and the driest month is typically September. The average wind speed ranges from almost 10 miles per hour in early spring to about 7 miles per hour in the midsummer. The wind directions vary, but are typically more northerly in the fall and winter and more southerly in spring and summer.
Section 3.0 Facility Assessment

The Tanners Bridge service area is located in northwest, west, and southwest portions of the County as shown in Figure 1.

3.1 Potable Water Supply

Potable water is supplied by the City of Winder from its potable water grid located throughout the service area and by Barrow County from its wholesale transmission mains and retail grid. Potable water will be supplied to the facility site by the City of Winder.

3.2 Projected Wastewater Generation

The Tanners Bridge Water Reclamation Facility will initially receive a flow of approximately 1,000,000 gpd from the existing service area. Subsequent flows will be generated from the service area through development. The design capacity of the Tanners Bridge Water Reclamation Facility is proposed to be 5.0 mgd. This size will provide capacity for future development of the service area. This size facility will provide excellent economy of scale.

Section 4.0 Design Wastewater Characteristics

4.1 Average and Peak Daily Flows

The basis of design, of this facility is 5.0 mgd annual average daily Flow. The flows will be delivered by the existing collection system. The collection system is experiencing low I&I. Cutting of easements, and inspection and maintenance of manholes will continue to be a routine maintenance priority. Flows to the existing LAS during the year from January, 2007 through December, 2007 were: Minimum: 0.045 MGD, Average: 0.079 MGD, Maximum: 0.113 MGD. The minimum peak factor required for this facility is 1.43 (0.113/.079). A more conservative peaking factor of 2.5 will be used to calculate the peak daily influent flow as follows: 2.5 mgd x 5.0 = 12.50 mgd peak daily influent flow rate.

In summary the basis of design is: Average Daily Flow: 5.0 mgd
Peek Daily Flow: 12.50 mgd
4.2 Influent Characteristics

The following influent characteristics affect the design required to meet the discharge parameters required by the Wasteload Allocation (Figure 3):

TABLE 2
INFLUENT BOD AND TSS AND pH FOR EXISTING TANNERS BRIDGE FACILITY

<table>
<thead>
<tr>
<th>MONTH</th>
<th>BOD</th>
<th>TSS</th>
<th>pH</th>
</tr>
</thead>
<tbody>
<tr>
<td>January, 06</td>
<td>305</td>
<td>103</td>
<td>6.56</td>
</tr>
<tr>
<td>February, 06</td>
<td>420</td>
<td>108</td>
<td>7.36</td>
</tr>
<tr>
<td>March, 06</td>
<td>610*</td>
<td>155</td>
<td>7.37</td>
</tr>
<tr>
<td>April, 06</td>
<td>590*</td>
<td>103</td>
<td>6.56</td>
</tr>
<tr>
<td>May, 06</td>
<td>150</td>
<td>115</td>
<td>7.28</td>
</tr>
<tr>
<td>June, 06</td>
<td>200</td>
<td>149</td>
<td>6.52</td>
</tr>
<tr>
<td>July, 06</td>
<td>96.7*</td>
<td>111</td>
<td>7.06</td>
</tr>
<tr>
<td>August, 06</td>
<td>360</td>
<td>90*</td>
<td>6.42</td>
</tr>
<tr>
<td>September, 06</td>
<td>280</td>
<td>92*</td>
<td>6.71</td>
</tr>
<tr>
<td>October, 06</td>
<td>650*</td>
<td>175</td>
<td>6.97</td>
</tr>
<tr>
<td>November, 06</td>
<td>235</td>
<td>103</td>
<td>7.18</td>
</tr>
<tr>
<td>December, 06</td>
<td>114</td>
<td>77*</td>
<td>7.03</td>
</tr>
<tr>
<td>January, 07</td>
<td>210</td>
<td>143</td>
<td>6.97</td>
</tr>
<tr>
<td>February, 07</td>
<td>270</td>
<td>76*</td>
<td>6.90</td>
</tr>
<tr>
<td>March, 07</td>
<td>224</td>
<td>112</td>
<td>6.90</td>
</tr>
<tr>
<td>April, 07</td>
<td>220</td>
<td>132</td>
<td>7.06</td>
</tr>
<tr>
<td>May, 07</td>
<td>200</td>
<td>76*</td>
<td>6.85</td>
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<tr>
<td>June, 07</td>
<td>79*</td>
<td>110</td>
<td>7.15</td>
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<tr>
<td>July, 07</td>
<td>72*</td>
<td>133</td>
<td>6.88</td>
</tr>
<tr>
<td>August, 07</td>
<td>122</td>
<td>60*</td>
<td>6.89</td>
</tr>
<tr>
<td>September, 07</td>
<td>269</td>
<td>280</td>
<td>6.75</td>
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<tr>
<td>October, 07</td>
<td>65*</td>
<td>56*</td>
<td>6.64</td>
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<tr>
<td>November, 07</td>
<td>182</td>
<td>194</td>
<td>6.87</td>
</tr>
<tr>
<td>December, 07</td>
<td>291</td>
<td>62*</td>
<td>6.75</td>
</tr>
<tr>
<td>AVERAGE:</td>
<td>238</td>
<td>139</td>
<td>6.90</td>
</tr>
</tbody>
</table>

- To make the average more accurate, results greater than 500 and less than 100 were not included in the average.
4.2.1 Biochemical Oxygen Demand (BOD)

The Tanners Bridge Facility will receive the same influent currently being received by the LAS System. LAS plant records indicate that the influent BOD will be 181 mg/l. A conservative BOD of 250 mg/l will be the basis of design.

**BOD: 250 mg/l**

4.2.2 Total Suspended Solids (TSS)

The Tanners Bridge Facility will receive the same influent currently being received by the LAS System. LAS plant records indicate that the influent TSS will be 160 mg/l. A conservative TSS of 250 mg/l will be the basis of design.

**TSS: 250 mg/l**

4.2.3 Nitrogen

The Tanners Bridge Facility will receive the same influent currently being received by the LAS System. LAS plant records indicate that the influent Nitrogen will be 23 mg/l. Since nitrification and denitrification processes will be used, total nitrogen is the parameter of concern.

**Total Nitrogen: 25 mg/l**

4.2.4 Total Phosphorous

Influent phosphorous testing was initiated on March 29, 2007 with the following tests completed:

- March 29, 2007: 0.064 mg/l
- April 5, 2007: 9.12 mg/l
- April 12, 2007: 7.89 mg/l
- April 19, 2007: 12.6 mg/l
- Average: 7.41 mg/l

**Total Phosphorous 7.0 mg/l**

7.0 mg/l phosphorous will be used as the basis of design.
4.2.5 Chloride

Chloride concentration of 7.7 mg/l in the influent is consistent with typical municipal wastewater. The wasteload allocation under which this DDR is being prepared has no effluent requirement for Chloride. Therefore, Chloride removal will not be a design parameter.

4.2.6 Sodium Adsorption Ratio

The Tanners Bridge Project will produce a highly treated effluent that will be discharged. Sodium Adsorption ratio is not applicable to a stream discharge. Therefore, Sodium removal will not be a design parameter.

4.2.7 Electrical Conductivity

The wasteload allocation under which this DDR is being prepared has no effluent requirement for electrical conductivity. Therefore, electrical conductivity will not be a design parameter.

4.2.8 Metals/Priority Pollutants

There are no metal producers that discharge to the Barrow County Sewer Collection System. In accepting new customers, the County refuses to accept such discharges. The LAS facility has consistently met its permit and has never been compromised from metals or priority pollutants.
4.2.9 ALKALINITY

Influent alkalinity testing was initiated on March 29, 2007 with the following test results:

<table>
<thead>
<tr>
<th>Date</th>
<th>Alkalinity (mg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>March 29, 2007</td>
<td>96</td>
</tr>
<tr>
<td>April 5, 2007</td>
<td>100</td>
</tr>
<tr>
<td>April 12, 2007</td>
<td>200</td>
</tr>
<tr>
<td>April 19, 2007</td>
<td>212</td>
</tr>
<tr>
<td>AVERAGE</td>
<td>152</td>
</tr>
</tbody>
</table>

Total Alkalinity is 152 mg/l

At this level, additional alkalinity will be needed. Equipment to feed lime will be provided.

4.2.10 FECAL COLIFORM

Fecal Coliform testing was initiated on March 29, 2007 with the following test results:

<table>
<thead>
<tr>
<th>Date</th>
<th>Count (CFU/ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>March 29, 2007</td>
<td>&gt;12,000</td>
</tr>
<tr>
<td>April 5, 2007</td>
<td>&lt;1,000</td>
</tr>
<tr>
<td>April 12, 2007</td>
<td>&gt;60,000</td>
</tr>
<tr>
<td>April 19, 2007</td>
<td>&gt;60,000</td>
</tr>
<tr>
<td>AVERAGE</td>
<td>33,000</td>
</tr>
</tbody>
</table>

LAS plant records indicate fecal coliform levels in the range of 2000-3000 /100 ml. The Wasteload Allocation requires 200 /ml effluent quality. This represents two log reduction. To insure that the ultra-violet disinfection system will meet the permit continuously, the UV system will be designed for a three log reduction.
4.2.11 TOTAL RESIDUAL CHLORINE

Chlorine will not be used. Ultraviolet disinfection will be used. However, the ability to feed HTH to chlorinate filamentous organisms in the RAS will be maintained.

4.2.12 DISSOLVED OXYGEN

It is expected that adequate oxygen will be introduced in the clarifiers, filters and effluent discharge piping. However, fine bubble diffusers will be installed in the effluent channel to provide additional DO to raise the DO to as high as 7 mg/l. The Wasteload Allocation requires a DO concentration of 5 mg/l.

4.3 Treated Effluent Characteristics

A “Qualifluent” advanced treatment process is proposed to meet the criteria indicated in the Wasteload Allocation. The proposed facility will utilize the following processes:

- Fine Influent Screening
- Biological Oxidation and Alum Feed
- Clarification of bio-solids and Phosphorous Precipitate
- Filtration
- Disinfection
- Supplementary Aeration

While not required by EPD, filtration will be utilized in conjunction with UV disinfection. The UV system will be designed to meet the permit requirement of 200 MPN /100ml with the filtered TSS range of 0 to 10 mg/l.

The combinations of these processes are proposed to meet the following treated effluent criteria:
Section 5.0 Process Design for Tanners Bridge Facility

5.1 General Design Considerations

The design of the Tanners Bridge Facility will be completed in accordance with the Georgia Environmental Protection "Wasteload Allocation" issued for this project.

In addition to the EPD Wasteload allocation noted above, the following additional criteria have been established by the City of Winder:

1. Odor Control - The facility will be designed to control odor generated by odor producing unit operations. Bio-filter technology will be used. The screen room and bio-solids handling room will be totally enclosed.

2. Facility Appearance - The "QualiFluent" building will not be identifiable as a wastewater treatment facility but will have the appearance of an attractive commercial building.

3. Noise Abatement - Low noise "Orbal" oxidation ditch technology will be utilized. Noise producing elements such as blowers will be installed inside a room in the QualiFluent building and where needed, inside sound attenuating enclosures.

Figure 2, Process and Instrumentation Diagram shows the unit operations proposed for the Tanners Bridge Facility.
5.2 Wastewater Collection and Delivery to Treatment Facility

The future collection system will be designed and constructed to minimize inflow and infiltration.

5.3 Pre-Treatment

5.3.1.A Influent Screening

Two inclined auger type mechanical screens will be utilized each having a capacity of 6.25 MGD for a total capacity of 12.50 MGD, the plant peak flow. The screens will be installed in a concrete channel with a 12.50 MGD manual bar screen by-pass serving as a back-up system as follows:

a. Each screen consists of a stainless steel basket containing 1/8" diameter holes, a stainless steel inclined tube, an auger inside the tube and a compression and discharge section. As wastewater flows through the screen all materials larger than 1/8" diameter are caught on the basket. As materials are caught, the upstream water level rises and higher elevation of the basket catches material. A float, located upstream of the screen, activates the screen auger once the upstream water level reaches a predetermined elevation. The auger will then turn. Brushes on the auger flights then remove the accumulated material and the flights transport the material up the inclined tube thus cleaning the basket. The upstream water level drops, the auger stops, and the cycle begins again.

b. As material is transported up the inclined tube it reaches the compression section where water is squeezed from the material. The material is then discharged into a plastic bag. The bag is fed from a cassette through an opening through the screen room floor into a container on the ground floor in the service room. The bag is periodically sealed and cut providing multiple sealed bags in the container. The container is periodically hauled and dumped in the lined Oakgrove Landfill located in Barrow County. The sealed bag provides odor control during transport.
c. Should the screen fail and the upstream level rise above the normal operating level, the influent will flow around the screen and pass through a manual bar screen in the influent screen channel just downstream from the auger Screen. In such case, a separate float switch will sound an alarm and notify the operator both locally and by telemetry.

d. The screens and their concrete channel will be located in the screen room at the highest elevation in the Qualifluent Facility.

e. Flow from the screen channel will be to the Vertical Loop Reactors via valved pipes.

5.3.1.B Odor Control

Odor Control will be necessary due to development near the facility site. In addition to normal operational procedures, to reduce the potential of odor, the addition of a foul air scrubber is proposed to remove and scrub air from the screen room of the Qualifluent building which will be the primary source of odor at the proposed facility.

The foul air scrubber will be specified with a stainless steel enclosure and utilize a bio-media consisting of wood chips impregnated with hydrated ferric oxide to facilitate the removal of hydrogen sulfide and hydrogen sulfide mercaptans. The proposed system is capable of removing 99+% at an average hydrogen sulfide level of 20 ppm. In order to reduce the build-up of hydrogen sulfide levels, the air in the screen room will be changed at least five (5) times per hour. The scrubbed air will be discharged to the atmosphere near the highest point in the Qualifluent structure.

5.3.2 Grit Removal

No separate facility grit removal system will be required. Particles of grit larger than 1/8” will be removed by the influent screen. Any remaining sand will be removed as a maintenance procedure when the VLR tanks are taken down for maintenance.
5.4 Secondary Treatment

5.4.1 Vertical Loop Reactors

Four biological reactors in the form of Orbal "vertical loop reactors" will be utilized. The disks will be easily accessible for maintenance. Disc covers will be provided. In addition, course bubble diffusion will be supplied for even greater reliability and process control. The design will include Class 1 reliability i.e. adequate oxygen transfer will occur with the largest blower drive out of service. The following criteria have been used:

a. MLSS: 4,400 mg/l (3800-5000 mg/l range)
   MLVSS: 3,212 mg/l (2774-3650 mg/l range)

b. Total Volume Required

The total volume is calculated using a value of 28.60 lbs of BOD per 1000 cubic feet per day as follows:

\[
250 \text{ mg/l BOD} \times 8.34 \times 5.0 \text{ mgd} = 10,425 \text{ lb BOD/day}
\]

\[
(10425 \text{ lb BOD/day}) / (28.60 \text{ lb BOD/1000 cf/day})= 364,510 \text{ CF nominal}
\]

\[
= 2,726,538 \text{ gallons nominal}
\]

c. Total Volume to be designed:

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Vertical Loop Reactors</td>
<td>4</td>
</tr>
<tr>
<td>Reactor water Depth, feet</td>
<td>21</td>
</tr>
<tr>
<td>Reactor Width, feet</td>
<td>30</td>
</tr>
<tr>
<td>Reactor length, feet</td>
<td>150</td>
</tr>
<tr>
<td>Volume of Each Reactor, cubic feet</td>
<td>94,500</td>
</tr>
<tr>
<td>Volume of Each Reactor, gallon</td>
<td>706,860</td>
</tr>
</tbody>
</table>

Total Aerated Volume (four tanks): 2,827,440 gal.
d. Hydraulic Detention Time Obtained from Design:

Acceptable range for oxidation ditch is **8-36 hours**

\[
\frac{2,827,440 \text{ gallons}}{5,000,000 \text{ gal/day}} = 0.565 \text{ days} = 13.6 \text{ hours}
\]

e. F/M Ratio obtained from Design

NOTE: F/M is used in this aeration design rather than MCRT since it provides a more accurate evaluation.

Acceptable range for an oxidation ditch is 0.05-0.30

\[
250 \text{ mg/l BOD} \times 8.34 \times 5.0 \text{ mgd} = 10,425 \text{ lb BOD/day}
\]

\[
4,400 \text{ mg/l} \times 8.34 \times 2.827 \text{ MG} = 103,740 \text{ Lb micro-organism}
\]

\[
F/M = \frac{10,425 \text{ Lb Bod/day}}{103,740 \text{ lb microorganisms}} = 0.10
\]

f. Waste Solids @ 0.87 lb/lb BOD

\[
10,425 \text{ lb BOD/day} \times 0.87 = 9,070 \text{ lb/day}
\]

g. Sludge Age

Acceptable range for oxidation ditch is 10-30 days

\[
\frac{4,400 \text{ mg/l} \times 2.827 \text{ mg} \times 8.34}{(9,070 \text{ lb/day} + 208.5 \text{ lb/day})} = 103,740 \text{ lb/9279 lb/day} = \text{ Sludge Age} = 11.2 \text{ days}
\]

h. Oxygen Requirements

| Lb of Oxygen per lb of BOD Oxidation: | 1.4 |
| Lb of Oxygen per lb of NH3 Oxidation: | 4.6 |

Lb of oxygen required:

FOR BOD: 10,425 lb BOD/day \times 1.4 lb oxygen/lb BOD = 14,595 lb/day

FOR NH3: 1043 lb NH3/day \times 4.6 lb oxygen/lb NH3 = 4,798 lb/day

\[
\text{TOTAL OXYGEN REQUIRED:} = 19,393 \text{ lb/day}
\]
De-nitrification Credit, %: 0

De-nitrification Credit, lb/day: 0
Actual Oxygen requirement lb/day 19,390
Temperature, C: 20

i. Process Split between Channels 1 2 3 4
Flow will be in series 27.7 26.1 24.6 21.6

j. Disc Mixing Performance

Mixing efficiency: 1HP/21,000 gal
Disc power required to mix, HP/tank 33 hp/tank
Discs per tank to provide mixing 74 discs
Number of discs designed per tank 80 discs
Number of discs per assembly 40 discs
Number of assemblies per tank 2 assembly

<table>
<thead>
<tr>
<th></th>
<th>DESIGN</th>
<th>MAXIMUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disc speed, RPM</td>
<td>47</td>
<td>47</td>
</tr>
<tr>
<td>Disc immersion, inches</td>
<td>15</td>
<td>17</td>
</tr>
<tr>
<td>Lb of Oxygen/disc/hr</td>
<td>1.46</td>
<td>1.62</td>
</tr>
<tr>
<td>BHP/disc</td>
<td>0.45</td>
<td>0.49</td>
</tr>
<tr>
<td>Design HP per assembly</td>
<td>18.0</td>
<td>19.8</td>
</tr>
<tr>
<td>Drive size, HP</td>
<td>20</td>
<td>20</td>
</tr>
</tbody>
</table>

FEF Based Upon:

Course bubble Alpha: 0.85
Temperature, Deg C 20
Disc Alpha 0.85
Beta 0.95
Cs 9.09
Elevation, Ft 800
ACF 0.97

SCF 1.161
Oxygen Delivery:

<table>
<thead>
<tr>
<th></th>
<th>TANK 1</th>
<th>TANK 2</th>
<th>TANK 3</th>
<th>TANK 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tanks Volume Split</td>
<td>25.0%</td>
<td>25.0%</td>
<td>25.0%</td>
<td>25.0%</td>
</tr>
<tr>
<td>Tanks Process Split</td>
<td>27.7%</td>
<td>26.1%</td>
<td>24.6%</td>
<td>21.6%</td>
</tr>
<tr>
<td>AOR Split, lbs/hr</td>
<td>223.8</td>
<td>210.9</td>
<td>198.8</td>
<td>174.5</td>
</tr>
<tr>
<td>DO Levels, mg/l</td>
<td>0</td>
<td>0.5</td>
<td>1.0</td>
<td>2.0</td>
</tr>
<tr>
<td>FCF for Discs</td>
<td>0.784</td>
<td>0.737</td>
<td>0.691</td>
<td>0.597</td>
</tr>
<tr>
<td>FCF for Course Bubble</td>
<td>0.784</td>
<td>0.744</td>
<td>0.704</td>
<td>0.623</td>
</tr>
<tr>
<td>SOR Delivery, Discs Portion, lb/hr</td>
<td>116.6</td>
<td>116.6</td>
<td>116.6</td>
<td>116.6</td>
</tr>
<tr>
<td>AOR Delivery, Discs Portion, lb/hr</td>
<td>91.4</td>
<td>86.0</td>
<td>80.5</td>
<td>69.6</td>
</tr>
<tr>
<td>SOR Delivery, Course Bubble Portion, lb/hr</td>
<td>168.8</td>
<td>167.9</td>
<td>168.1</td>
<td>168.4</td>
</tr>
</tbody>
</table>

AIR REQUIREMENTS:

<table>
<thead>
<tr>
<th></th>
<th>TANK 1</th>
<th>TANK 2</th>
<th>TANK 3</th>
<th>TANK 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diffuser Submergence, ft</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>SOTE, %</td>
<td>18.6%</td>
<td>18.6%</td>
<td>18.6%</td>
<td>18.6%</td>
</tr>
<tr>
<td>SCFM</td>
<td>877</td>
<td>872</td>
<td>873</td>
<td>875</td>
</tr>
<tr>
<td>SCFM/diffuser</td>
<td>7.3</td>
<td>7.3</td>
<td>7.3</td>
<td>7.3</td>
</tr>
<tr>
<td>Number of Diffusers</td>
<td>120</td>
<td>120</td>
<td>120</td>
<td>120</td>
</tr>
<tr>
<td>Maximum SCFM</td>
<td>960</td>
<td>960</td>
<td>960</td>
<td>960</td>
</tr>
<tr>
<td>Maximum SCFM/diffuser</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Max. SOR delivery, course bubble (lb/hr)</td>
<td>185</td>
<td>185</td>
<td>185</td>
<td>185</td>
</tr>
</tbody>
</table>

TOTAL DESIGN AERATION POWER REQUIREMENTS:

<table>
<thead>
<tr>
<th></th>
<th>DESIGN HP</th>
<th>MAX. HP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design Discs, hp</td>
<td>160</td>
<td>158.4</td>
</tr>
<tr>
<td>Course Bubble</td>
<td>175.7</td>
<td>193.0</td>
</tr>
<tr>
<td>Total hp</td>
<td>335.7</td>
<td>351.4</td>
</tr>
</tbody>
</table>

*blower efficiency: 70%
 motor efficiency: 90%
 blower discharge at 9.5 psig
RESERVE OXYGEN TRANSFER CAPACITY:

<table>
<thead>
<tr>
<th></th>
<th>Design SOR</th>
<th>Max. SOR</th>
<th>% Reserve</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design Discs</td>
<td>466 lb/hr</td>
<td>517 lb/hr</td>
<td>10.9</td>
</tr>
<tr>
<td>Course Bubble</td>
<td>673 lb/hr</td>
<td>739 lb/hr</td>
<td>9.8</td>
</tr>
<tr>
<td>Total</td>
<td>1139 lb/hr</td>
<td>1256 lb/hr</td>
<td>Avg: 10.3</td>
</tr>
</tbody>
</table>

5.4.2 Flow Splitting to the Secondary Clarifiers

To insure that the loading of each of the four secondary clarifiers is equal, a flow splitting effluent channel will be provided at the VLR tanks. VLR operation will normally be in series with mixed liquor flowing from VLR #1 through two, 4'x4' submerged opening into VLR # 2 and subsequently flowing from VLR #2 through two, 4'x4' submerged opening into VLR # 3, and subsequently flowing from VLR #3 through two, 4'x4' submerged opening into VLR # 4. Mixed liquor will then flow from VLR #4 over two, 12.0 foot wide horizontal weir gates with subsequent flow through four 1.5' wide transfer channels to the four transflo clarifiers.

Identical weir gate systems will be provided for VLR No. 1, VLR No. 2, and VLR No. 3. Slide gates will be provided in the splitter effluent channels. This system will allow for operation of any of the VLR tanks with either of the others drained for maintenance while providing an equal split to the clarifiers.

5.4.3 Secondary Clarification

Four rectangular “Trans-Flo™” Envirex clarifiers will provide secondary clarification, each with a capacity of 1.25 mgd average daily flow. The return flow will be 150% = 1.88 mgd for each clarifier. The units shall be side fed with side effluent launders and weirs. The effluent weirs shall be at the opposite side of the tanks from the upturn zone. Each clarifier will be 30 feet wide and 126 feet long with a side water depth of 19.39 feet. RAS will be taken from the bottom of each clarifier by fixed horizontal collectors. The collection shall be hydraulically driven from the 19.39’ head of the
## TABLE 3

**POUNDS OF PHOSPHOROUS PRECIPITATE SLUDGE**

<table>
<thead>
<tr>
<th>Parameters:</th>
<th>Average</th>
<th>Peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow</td>
<td>5.00 mgd</td>
<td>12.50 mgd</td>
</tr>
<tr>
<td>Influent Phosphorus</td>
<td>7.00 mg/l</td>
<td></td>
</tr>
<tr>
<td>Effluent Phosphorus Limit</td>
<td>1.00 mg/l</td>
<td></td>
</tr>
<tr>
<td>Influent BOD</td>
<td>250.00 mg/l</td>
<td></td>
</tr>
<tr>
<td>Biological Yield</td>
<td>0.20 lb VSS/lb BOD</td>
<td></td>
</tr>
<tr>
<td>% Wt of Phosphorus</td>
<td>4.50%</td>
<td></td>
</tr>
</tbody>
</table>

**Estimated Phosphorus required to be removed**

\[
\text{# of Phosphorus Influent} = 5.00 \times 7.00 \times 8.34 = 291.9 \text{ #/day P influent}
\]

**Biomass Produced**

\[
\text{# of Phosphorus Associated with Biomass} = 2065.00 \times 0.045 = 93.83 \text{ #/day P Wasted}
\]

**Net Phosphorus to be Removed**

\[
291.9 - 93.83 = 198.07 \text{ #/day P}
\]

**Estimated Alum Addition Required**

**Parameters:**

\[
\text{Al / P dose} = 2.2 \text{ Needs to be greater than stoichiometry value.}
\]

**Accepted value in literature**

\[
\text{# of Aluminum Required} = 198.07 \times 2.2 \times 27.00 / 31.00 = 379.52 \text{ # Al / day}
\]

\[
\text{# of Al}_2(\text{SO}_4)_{3\cdot 18}\text{H}_2\text{O} \quad \text{Ave} = 379.52 \times 666.00 / 27.00 = 9361.49 \text{ # Al}_2(\text{SO}_4)_{3\cdot 18}\text{H}_2\text{O} / \text{day}
\]

\[
\text{Gals of Al}_2(\text{SO}_4)_{3\cdot 18}\text{H}_2\text{O} = 0.361.49 / 11.1 = 483.38 \text{ Gal Al}_2(\text{SO}_4)_{3\cdot 18}\text{H}_2\text{O} / \text{day}
\]

**# of Phosphorus Precipitate Sludge**

\[
\text{Al + PO}_4 = \text{AlPO}_4
\]

\[
\text{Al + 3 OH} = \text{Al(OH)}_3
\]

\[
2.2 \times 5.94 \times 27.00 / 31.00 = 11.38 \text{ mg/l Al}
\]

\[
7.00 / 31.00 = 0.23 \text{ mmole/l AlPO}_4 \text{ Produced}
\]

\[
9.10 / 27.00 = 0.34 \text{ mmole/l Al added}
\]

\[
0.34 / 0.23 = 0.11 \text{ mmole/l Al in excess to Al(OH)}_3
\]

\[
\text{AIPO}_4 \text{ Sludge} = 0.23 \times 122 = 27.55 \text{ mg/l AlPO}_4
\]

\[
\text{Al(OH)}_3 \text{ Sludge} = 0.11 \times 78 = 8.68 \text{ mg/l Al(OH)}_3
\]

**Theoretical I Chemical Sludge**

\[
= 36.23 \text{ mg/l}
\]

**Safety Factor**

\[
= 1.35
\]

**Total Chemical Sludge**

\[
= 48.91 \text{ mg/l}
\]

**# of Phosphorus Precipitate Sludge**

\[
48.91 \times 5.00 \times 8.34 = 2040 \text{ lbs TSS/day}
\]

**IMPORTANT ADDITIONAL DESIGN CONSIDERATION**

POLYMER ADDITION MUST ALSO BE DESIGNED IN AND UTILIZED.  
FIGURE POLYMER ADDITION AT 1.0 TO 3.0 MG/L.
tanks. RAS will be transported to the RAS pump station by gravity pipeline. Scum will be collected by a horizontal "tilt" pipe for manual skimming. The skimmings will be discharged to a scum box and pumped to the digestion system. Sludge Volume Index (SVI) is not being used in this design due to its use often leading to under designed clarification systems. Instead, a conservative approach is being used i.e. 19.39 feet side water depth and low surface and solids loading rates. The design is based on the following calculations and their conformance to "Wastewater Engineering" Metcalf and Eddy, INC, Third Edition, pages 587 and 588 and Table 10-12 and empirical testing by US Filter/Envirex, the equipment manufacturer:

a. Surface Loading for each tank

1) Design Loading Rates:
   a) Average Flow: 400 gal/day/sf
   b) Peak Flow: 1000 gal/day/sf

2) Surface Area: 126 ft x 30 feet = 3780 sf

3) Flows:
   Forward Flow: 1.25 mgd
   Peak Flow: 3.125 mgd
   Return Flow: 1.88 mgd

4) Surface Loading:
   a) Average Flow: 1.25 mgd/3780 sf = 331 gal/day/sf
   b) Peak Flow: 3.125 mgd/3780 sf = 827 gal/day/sf

b. Weir Loading

1) Basis of Design 30,000 gallons/lf/day at peak flow
2) Required Length = 3,125,000 gal/day/30,000 gal/day/lf = 104 feet

3) Actual Length = 126 feet (Which exceeds the required length).
Extensive testing by US Filter/Envirex has determined that this loading rate is more than adequate.

c. Solids Loading

1) Basis of Design: 38.0 lb solids/sf/day

2) Solids: (1.25 mgd + 1.88 mgd) x 4400mg/l x 8.34 = 114,858 lb solids/day

3) Loading (114,858 lb solids/day)/(3780 sf) = 30.4 lb solids/sf/day

5.4.4 Return Activated Sludge (RAS) Pump Station

The RAS pump station will be a submersible pump station utilizing a cast in place wet well located inside the facility. It will consist of two pumps each capable of pumping 5208 gpm (7.5 MGD which is a return rate of 1.5x forward flow) and one pump in reserve. The RAS pipeline will discharge to the VLR tanks via four valved outlets, one to each VLR tank. Variable speed will be used to match flows to that resulting from telescoping valve settings. A meter will be provided to measure RAS flow.

5.4.5 Waste Activated Sludge Flow

WAS flow will be taken from the RAS force main through a motor operated valve with RAS flow discharging to the digesters.
5.5 Post Treatment

5.5.1 Phosphorous removal

The first VLR tank will be operated in an anoxic condition to facilitate biological phosphorous removal. Alum or Ferric Chloride will be fed to the VLR aeration tanks or the transfer channel. The Phosphorous precipitate will be formed in the VLR system and then transported via the transfer channels to the four clarifiers. The Phosphorous precipitate will settle along with the bio-solids and will be collected and transferred back to the aeration system via the RAS pump station. Bio-solids and Phosphorous precipitate will be wasted to the aerobic digesters. The combined solids will be digested and subsequently dewatered using a belt press. The resulting solids will be discharged to roll-off containers for transport to the Oakgrove lined land fill in Barrow County.

See Table 3 for phosphorus precipitate sludge calculation. Total phosphorus precipitate sludge influent to the digesters is 2040 lbs/day.

5.5.2 Filtration

Secondary effluent will be transported from the clarifiers to the filter/disinfection room via pipeline. Filtration shall consist of the following:

1)  Coagulant chemical feed.

Anionic polymers, selected by field trials, will be diluted in a day tank with mixer and fed by a variable speed, variable stroke flow pacing feed pump to the far end of the “TransFlo™” clarifier effluent channels and/or influent channels. The polymer will be diluted to the extent that it will not foul the piping between the pump and the clarifiers.
2) Disk Filter System

Filtration will be provided to facilitate the use of ultra-violet disinfection and increase reliability of the sedimentation system. Disk filters will be utilized as follows:

Number of filter units: 4
Backwash: High pressure reuse water flowing to RAS pump station
Via gravity line
Capacity, each filter 1.666 mgd average, 4.1666 mgd peak
Filter opening size 10 microns
Reliability Class 1 (one filter in reserve)

Each filter unit will be independent. Flow splitting will be by splitter box just upstream from the filters.

5.5.3 Disinfection

Disinfection will be provided by ultra-violet light. Acquionics, in pipe, medium density units will be designed using the following criteria:

Number of UV Units 3
Size 20"
Reliability Class 1
Capacity, each unit: 6.25 mgd peak
Transmissivity: 65% (water samples from existing Cedar Creek Facility will be tested to confirm this value)

Cleaning mechanism: Automatic
Effluent, Fecal Coliform, /100 ml less than 200 @ peak flow
Flow Splitting Will be accomplished by balanced piping
5.5.4 Plant Effluent Flow Measurement

Flow measurement will be provided by an 18” throat width Parshall flume using an ultrasonic water level detector. A 4-20 ma signal will be transmitted to the plant PLC and displayed on the PC. The flow will be totalized by the PC. A separate flow pacing signal will be transmitted to the automatic samplers and chemical feed equipment. The flume will be able to measure flows from 0.33 MGD to 15.9 MGD. The range of plant design flows is 1.00 MGD to 12.5 MGD.

5.5.5 Off Line Storage Pond

A continuous reading TSS meter will measure the TSS of the effluent stream. Should the TSS be measured to be greater or equal to 20 mg/l, the effluent pumps will be stopped and the flow will bypass to a pipeline to the existing lined storage pond. Effluent will then flow to the existing lined pond rather than being pumped to the Apalachee river.

An audible plant alarm will sound and the operators will be called via cell phones. Flow will continue to the off line storage pond until the system is reset by the operator. At an appropriate time the existing pump station at the pond will be manually started to allow flow to one of the plant influent force mains. The water diverted to existing lined pond will be re-treated.

5.5.6 Plant Drain

A plant drain will be installed delivering flow to a plant drain pump station. This drain will transport plant bathroom waste, and washdown water. It will also transport water from tanks that need to be drained for maintenance.
5.5.7 Emergency Overflow

In the highly unlikely event of an inadvertent tank overfilling due to an improperly closed valve or pump failing to stop, all tanks will be equipped to discharge to the secondary clarifier tanks. The secondary clarifier system will be equipped with an overflow pipe that will discharge to the existing lined storage pond. In the event of such an overflow, an alarm will sound and operators will be called via cell phones.

5.6 Solids Handling

5.6.1 Mass Balance

The following mass balance addresses the balancing of liquids, and solids in the facility. All calculations are based on average daily flow in accordance with paragraph 12.16 of the 3rd edition of Metcalf & Eddy, Inc. "Wastewater Engineering", page 891 “basis for preparation of mass balances”:

a. Liquid Balance

Average daily influent flow: 5 mgd

Liquid discharged with sludge:
11,110 lb/day dry solids (bio and phosphorous solids)
20% Belt press discharge concentration
Total Mass (solids and water) = 11,110/.2 = 55,550 Lb/day
Mass of water only = .8 x 55,550 Lb/day = 44,440 lb/day
Volume of water = 44,440 lb/day/8.34 = 5,328 gal/day
= 0.005 mgd

Effluent liquid flow: 4.995 mgd

TOTAL INFLUENT FLOW = TOTAL EFFLUENT FLOW = 5.000 mgd
b. Solids Balance

1. ADF  5.0 mgd
2. Influent Characteristics
   - BOD  250 mg/l
   - TSS  250 mg/l
3. Solids Characteristics
   - Total Solids in digested sludge  3%
4. Effluent characteristics
   - BOD  10 mg/l
   - TSS  20 mg/l

Balance:

Daily mass values:
   - BOD: 5 mgd x 250 mg/l x 8.34 = 10,425 lb/day
   - TSS: 5 mgd x 250 mg/l x 8.34 = 10,425 lb/day
   - Phosphorous solids = 2,040 lb/day
Total Influent solids: 22,890 lb/day

Less:
   - Solids mass delivered to the land fill: 10,780 lb/day
   - Solids in the effluent (4.995 mgd x 20 mg/l x 8.34 =) 833 lb/day
   - Solids reduction in aeration and digestion: 11,277 lb/day
Unaccounted for solids: 0 lb/day

5.6.2 Aerobic Digestion and Dewatering System

Bio-solids will be processed by two aerobic digesters (60.00 ft x 41.0 ft each). Piping will be designed to allow for decanting of solids. A surface mixer will be used to mix each tank.

a. Digester Tanks
   The Digester Tank design is based upon the following criteria:

   Minimum Hydraulic Detention Time Required: 10 days
   Energy Requirements for Mixing: 40 hp/MG
   Volume of each tank: 41 x 60 x 22 x 7.48: 404,818 gal
   Mixer horse power: 40 hp/mg x 0.404818 mg: 16 HP each
   20 HP will be designed
Waste Sludge transferred: 9,070 lb/day  
Phosphorus Precipitant Sludge: 2,040 lb/day  
Total Sludge Transferred: 11,110 lb/day  

Waste Sludge Concentration: 0.88% by weight  
Side wall depth selected: 22 feet  
Decanting Daily  
Settled Sludge concentration 3% by weight  

VOLUME CALCULATION:  

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLARIFIER % SOLIDS, (LB SOLIDS/LB WATER) × 100</td>
<td>0.88</td>
</tr>
<tr>
<td>DECANT % SOLIDS, (LB SOLIDS/LB WATER) × 100</td>
<td>0</td>
</tr>
<tr>
<td>PROPOSED DIGESTER VOLUME, gal</td>
<td>809,645 gal</td>
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<tr>
<td>= 2x 41 feet x 60 feet x 22 feet x 7.48 gal/cf</td>
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</tr>
<tr>
<td>DESIRED NET FLOW RATE TO DIGESTER, gal/day</td>
<td>44,405 gal/day</td>
</tr>
<tr>
<td>= 11,110 lb/day/(3% solids/100)/8.34 = 44,405</td>
<td></td>
</tr>
<tr>
<td>FLOW RATE TO DIGESTER, gal/day</td>
<td>123,583 gal/day</td>
</tr>
<tr>
<td>= 9070 lb/day/(0.88% solids/100)/8.34 = 123,583</td>
<td></td>
</tr>
<tr>
<td>REQUIRED DECANT FLOW RATE, gal/day</td>
<td>79,178 gal/day</td>
</tr>
<tr>
<td>= 123,583 gpd - 44,405 gpd = 79,178 gpd</td>
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</tr>
<tr>
<td>MINIMUM RETENTION, days</td>
<td>10 days</td>
</tr>
<tr>
<td>VOLUME REQUIRED FOR HYDRAULIC LOADING, gal</td>
<td>444,050 gal</td>
</tr>
<tr>
<td>= 44,405 gal/day x 10 days = 444,050 gal</td>
<td></td>
</tr>
</tbody>
</table>

The actual hydraulic detention time will be: 17.9 days
EACH OF THE DIGESTER TANKS WILL CONTAIN THE FOLLOWING COMPONENTS:

1) Coarse bubble diffuser grid.
   The blowers will deliver only that air required for process. Mixing will be accomplished by use of surface mixers.

2) Decant pipes
   Each tank shall be equipped with 8-inch diameter decant pipes. Each decant pipe will be equipped with a manually operated valve. The tanks will be periodically decanted with the flow discharged to the RAS pump station.

3) Floating Mixer
   Each digester tank will contain a floating mixer which will run continuously except during decant operations.

OXYGEN DELIVERY TO THE DIGESTER TANKS

The digester tank oxygen will be provided by a coarse bubble diffuser system. Air requirements are calculated as follows:

Waste sludge to digester = 9070 lb/day
Percent VSS = 73%
Volatile solids to digester = 9070 x 0.73 = 6,621 lb/day
Volatile solids destruction = 40%
Volatile solids destroyed = 6,621 x 0.4 = 2,648 lb/day
Oxygen demand per lb VSS destroyed = 2 lb O2/lb VSS
Oxygen required = 2,648 x 2 = 5,296 lb/day
Oxygen Transfer Efficiency = 16%
SCFM = 5296/24/60/0.01725/0.16 = 1,333 scfm

Diffuser type: Valved Orifice Course Bubble
Airflow per diffuser: 10 scfm
Diffuser quantity 133
The bio-solids produced by the process will be periodically dewatered using a belt filter press. The dewatered solids will be hauled to and disposed at the Oakgrove lined landfill located in Barrow County.

Blower Requirements

Digester Process Air = 1,333 scfm

Blower HP=

\[ \text{Blower HP} = 1333 \times 0.227 \times (((14.1 + 10.2) / 14.7 / 0.981) \times (0.283 - 1)) / 0.7 / 0.9 \]

\[ = 94.0 \text{ HP} \quad \text{Supply (1) 100 HP BLOWER (VLR SPARE BLOWER USED AS BACK-UP)} \]

Dewatering will be accomplished using a 2.5 meter belt press. This unit will be designed to allow for processing of the plant production of bio-solids and alum phosphorous solids with adequate time available for maintenance and repair as follows:

Plant production of solids: 11,110 lb/day dry solids
Rated throughput of dry solids @ 18%: 2,813 lb dry solids/hr
Hours per day operation (7 days): \( \frac{11110}{2813} = 3.95 \text{ hours/day} \)
Hours per day operation (5 days): \( \frac{3.95 \times 7}{5} = 5.53 \text{ hours/day} \)

The sizing of this dewatering system provides excellent reliability since recovery from a maintenance event is rapid. For example, if the press were out of service for one week, the inventory of solids would increase by 77,770 lb (11,110 lb/day x 7 days). Recovery would occur as follows operating 24 hours per day:

If \( T = \text{number of days to recover} \), Then

\[ T \times (24 \text{ hr/day}) (2813 \text{ lb/hr}) = 77,770 \text{ lb} + T \times 11,110 \text{ lb/day} \]

\[ 67512T = 11,110T + 62,216 \]
\[ 56,402T = 62,216 \]

\[ T = 1.10 \text{ days to recover from a one week shutdown.} \]
This confirms the high reliability resulting from installing a single, high quality, properly sized belt press. To further enhance this reliability, a spare parts inventory as recommended by the belt press manufacturer will be maintained at the facility.

5.7 Effluent Discharge

Following flow measurement, the effluent will be pumped via ductile iron force main to the discharge point at the Apalachee at the location indicated in the wasteload allocation application.

5.8 Plant Utilities

Electrical service to the proposed facility is through Jackson EMC. The new facility will be designed with a back-up generator.

The City of Winder will be providing the potable water needs of the facility including fire protection. Reduced pressure backflow preventers will be designed to protect the restrooms and break rooms, emergency shower/eye wash, and the City of Winder potable water system.

Utility water produced by the facility will be available for wash down and dilution needs at the facility and will minimize the demand for potable water.

5.9 Freeze Protection

Facilities and equipment that are exposed to the elements have the possibility of freezing. It is necessary to protect these processes in order to minimize or eliminate a disruption in the process. Freeze protection is provided to the following process by mechanical and operational means:

A. Pre-Treatment

The influent screening unit will be housed inside the Screen Room. The screen room will be odor controlled with the inside and outside air temperatures near equal. During the winter months, there could be the potential for freezing to occur. The building and screening devices will be designed as if they were exterior applications. The screens will be
specified with OEM heat tracing of the spray water system, and wash down hose bibbs will be specified as freeze-proof.

B. The Vertical Loop Reactors

These units have no components that will freeze other than wash down piping. The hydrants will be specified as self-draining, freeze-proof. Supply piping will be under the process water surface for freeze protection.

C. Clarifiers

These units have no components that will freeze other than wash down piping. The hydrants will be specified as self-draining, freeze-proof. Supply piping will be under the process water surface for freeze protection.

E. Disk Filters, Ultra-Violet Disinfection, Flow Measurement, Phosphorous removal and Chemical Feed Equipment

These unit processes will be installed within a building, and therefore freezing will not be a concern.

F. Facility Pump Stations

All proposed pump stations will be designed to be submersible type, and will not freeze.

G. Digesters - These units have no components that will freeze.

H. Gravity Sewers and Force Mains

All such piping will either be underground or inside the plant building. There will be no freezing of these systems.
I. Grounds, Walkways and Electrical Lines

Under infrequent weather conditions, ice may form on walkways and grass. Walkways will be maintained by the operators using approved deicing compounds. The two power companies will be responsible for maintaining their lines in such conditions. Where feasible, electrical feed will be underground.

6.0 By-passing Equipment for Maintenance Purposes.
Duplicity.

All process equipment may be bypassed for maintenance as follows:

A. Influent Screen
   Either or both of the two mechanical screens may be bypassed by inserting hand gates upstream. The flow overtops a weir and passes through a manually cleaned bar screen or through the adjacent mechanical screen if only one screen needs to be by-passed. This arrangement provides Class 1 reliability through duplicity.

B. Vertical Loop Reactors
   Each of these four tanks may be removed from service. The tanks may be operated in series, the normal mode, or parallel. Screened wastewater and RAS may be introduced into any one of the three tanks. Each tank has its own effluent weir. This arrangement provides Class 1 reliability through duplicity.

C. "Trans-Flo™" Clarifiers
   These units operate in parallel. Any one may be taken out of service with flow continuing through the remaining three. This arrangement provides Class 1 reliability through duplicity.
D. FILTERS
Four units are to be installed. Peak flow will be processed through three units. When one unit is out of service the flow continues through the remaining three. This arrangement provides Class 1 reliability through duplicity.

E. Ultraviolet Disinfection Units.
Three units are to be installed. Peak flow will be processed through two units. When one unit is out of service the flow continues through the remaining two. This arrangement provides Class 1 reliability through duplicity.

F. Flow Meter
All parts requiring repair are removable without taking the flume out of service. However, this unit could be bypassed using the reject line to the storage pond. Should the ultrasonic transmitter fail, flow readings may be taken manually using the depth scale provided with the flume.

6.1 Operational Flexibility

This facility is highly flexible in its design as follows:

A. The aeration system may be operated in series or parallel.

B. Biological phosphorous removal may be used by operating one of the VLR tanks in an anoxic mode.

C. A storm mode may be initiated by the operator by operating screened influent and RAS valves. In this mode, solids are stored in VLR #1 until the storm passes. This mode will only be required under very rare storm conditions.

D. The clarifiers operate in parallel. One may be removed from service in the early years of operation when the flow is low.
6.2 Thermal/Heat Protection for Mechanical Equipment

Thermal/heat protection is an issue in a building. Air handlers will be designed by a professional mechanical engineer to insure proper cooling of mechanical equipment is provided.

6.3 Sludge Treatment and Disposal Methods

While sludge treatment is discussed in other sections of this report, the following summary is presented to provide an overall view of this important unit operation:

Two types of sludge are generated, bio-solids from the activated sludge process and phosphorous sludge from the chemical precipitation with Alum. Both of these components are aerobically digested and dewatered using a high quality, high capacity belt press. Polymers will be used with the belt press. The dewatered sludge at 18-20% dry solids will be discharged to a screw conveyor system that will deposit the solids in one of three 20 CY steel roll on containers. The containers will be transported to the Oakgrove lined landfill.

6.4 Process Summary

The proposed combinations of treatment devices provide a cost-effective solution that is capable of meeting the strict discharge standards indicated in Georgia Environmental Protection Division NPDES wasteload allocation issued for this facility. The proposed processes will maximize the facilities' abilities to meet the discharge requirements while minimizing the energy requirements that could impact operation and maintenance costs.
Table 4

**DESIGN PARAMETER SUMMARY**

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>CAPACITY REQUIRED</th>
<th>CAPACITY DESIGNED</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INFLUENT SCREENING</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt; MECHANICAL SCREEN</td>
<td>12.5 MGD</td>
<td>6.25 MGD</td>
</tr>
<tr>
<td>2&lt;sup&gt;nd&lt;/sup&gt; MECHANICAL SCREEN</td>
<td>6.25 MGD</td>
<td>6.25 MGD</td>
</tr>
<tr>
<td>MANUAL SCREEN</td>
<td>12.5 MGD</td>
<td>12.5 MGD</td>
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<tr>
<td><strong>AERATION</strong></td>
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<tr>
<td>Disc Drives</td>
<td>2,048,713 GAL</td>
<td>2,827,440 gal</td>
</tr>
<tr>
<td>8EA-20HP each</td>
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<td>8EA-20HP each</td>
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<tr>
<td><strong>BLOWERS</strong></td>
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<tr>
<td>BLOWER NO 1 (VLR):</td>
<td>176 HP</td>
<td>200 HP</td>
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<tr>
<td>BLOWER NO 2: (Digester Process)</td>
<td>94 HP</td>
<td>100 HP</td>
</tr>
<tr>
<td>BLOWER NO 3: (SPARE)</td>
<td>200 HP</td>
<td>200 HP</td>
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<td><strong>CLARIFICATION</strong></td>
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<td>TANK No. 1</td>
<td>30'WX23'DX104'L</td>
<td>30'WX23'DX126'L</td>
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<td>TANK No. 2</td>
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<td>30'WX23'DX126'L</td>
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<td>TANK No. 3</td>
<td>30'WX23'DX104'L</td>
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<td><strong>Filtration</strong></td>
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<td>12.5 MGD PEAK</td>
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<td>FILTER No. 1</td>
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## Design Development Report

### Parameter

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<tr>
<th>Parameter</th>
<th>Capacity Required</th>
<th>Capacity Designed</th>
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<tr>
<td><strong>Disinfection</strong></td>
<td>12.5 MGD</td>
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<tr>
<td>UV No. 1</td>
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<td>6.25 MGD</td>
</tr>
<tr>
<td>UV No. 2</td>
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<td>6.25 MGD</td>
</tr>
<tr>
<td>UV No. 3</td>
<td></td>
<td>6.25 MGD</td>
</tr>
<tr>
<td><strong>Flow Measurement</strong></td>
<td>1.0 MGD to 12.5 MGD</td>
<td>0.33 MGD to 15.9 MGD</td>
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<td><strong>RAS Pump Station</strong></td>
<td>7.5 MGD</td>
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<td>Pump No. 1</td>
<td>0-7.5 MGD</td>
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<tr>
<td>Pump No. 2</td>
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<td><strong>Plant Water Pump Station</strong></td>
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<td><strong>UV Recirculation Pump Station</strong></td>
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<td><strong>Sludge Pump Station</strong></td>
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<tr>
<td>Pump No. 1</td>
<td>100-450 GPM</td>
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<tr>
<td><strong>Note:</strong> Spare internal parts required on hand</td>
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<tr>
<td><strong>Plant Drain Pump Station</strong></td>
<td>100 GPM</td>
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<tr>
<td>Pump No. 1</td>
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<td>300 GPM</td>
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<tr>
<td>Belt Press</td>
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<tr>
<td>Digesters</td>
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<tr>
<td>Tank No. 1</td>
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<td>Digester Mixers</td>
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<td>Mixer No. 1</td>
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<td>Mixer No. 2</td>
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<tr>
<td>Alum Feed Pumps</td>
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<td>Pump No. 1</td>
<td>35 GPH</td>
<td>0-45 GPH</td>
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<td>Pump No. 2</td>
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<tr>
<td>Polymer Feed Pump</td>
<td>5 GPH</td>
<td>0-8.5 GPH</td>
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</tbody>
</table>

Lime Feed Equipment

*Note: It is anticipated that lime will not be required. However, lime feed lines will be installed and if lime is required, the equipment will be furnished and installed by the lime vendor.*
### TABLE 5

CHEMICALS USED IN FACILITY

<table>
<thead>
<tr>
<th>CHEMICAL</th>
<th>PROCESS</th>
<th>PURPOSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALUM</td>
<td>AERATION</td>
<td>PHOSPHOROUS REMOVAL</td>
</tr>
<tr>
<td>ANIONIC POLYMER</td>
<td>CLARIFICATION</td>
<td>FILTER AND SEDIMENTATION</td>
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<tr>
<td>CATIONIC POLYMER</td>
<td>BELT PRESS</td>
<td>DEWATERING</td>
</tr>
<tr>
<td>HTH</td>
<td>RAS</td>
<td>FILAMENTOUS BACTERIA CONTROL</td>
</tr>
</tbody>
</table>