

**Request for Proposals (RFP)  
Membrane Bioreactor (MBR) System**



*welcome neighbors.*

**Town of Bennett  
Bennett Water Reclamation and Resource  
Recovery (WRRRF) Expansion Project**

**October 2022**

## Invitation to Propose and General Instructions

**Date:**           **October 27, 2022**

**Re:**           **Request for Proposals (RFP)**  
**Membrane Bioreactor (MBR) System**  
**Town of Bennett Water Reclamation and Resource Recovery Facility (WRRRF)**

Pre-qualified named Equipment Suppliers are invited to submit a proposal to the Town of Bennett, Colorado (OWNER or Town) to furnish services and equipment in accordance with the Request for Proposal (RFP) - Membrane Bioreactor (MBR) System for Town of Bennett Water Reclamation and Resource Recovery Facility (WRRRF) Project.

**The RFP is available on the Town's website.**

### Submittal Instructions

Submit digital (.pdf) proposals to the Town through an emailed link to a vendor provided Dropbox or other secure file transfer site no later than 3:00 pm Mountain Standard Time November 14, 2022. Emailed proposals will not be accepted. Vendors shall email the file transfer link to Daymon Johnson (djohnson@Bennett.co.us) and Sandra Dudley (sandra.dudley@aquang.com).

Proposals received after the time and date above will be considered late and will be rejected without receiving any further consideration.

Within three business days following digital submission, two hard copies of the proposal shall be provided to Sandra Dudley with AQUA Engineering at 7935 East Prentice Avenue, Suite 100, Greenwood Village, CO 80111. The digital proposal will govern if discrepancies exist between the digital copies and hard copies of the proposal.

Proposals shall be clearly marked **Proposal - MBR for Town of Bennett - WRRRF Project.** The proposals will not be opened publicly. Proposals will be considered based on the requirements herein.

Owner is exempt from Colorado State Sales and Use Taxes on materials and equipment to be incorporated in the Work (Exemption No. 09805976).

All proposals shall exclude sales, use, and any other taxes otherwise collected by the Colorado Department of Revenue.

Please contact the Design Engineer noted below to ask technical questions in writing. Submitted written questions and the written responses to questions will be provided to all Proposers via Addendum. Questions submitted less than seven (7) business days before the due date may not be addressed.

Sandra Dudley, PhD, PE  
AQUA Engineering, Inc.  
[sandra.dudley@aquang.com](mailto:sandra.dudley@aquang.com)  
720-667-1256

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**Attachments:**

- Attachment 1 Additional Information
- Attachment 2 Technical Specifications

**Town of Bennett  
Bennett, Colorado**

**Request for Proposals (RFP)  
MEMBRANE BIOREACTOR (MBR) EQUIPMENT  
for the**

**BENNETT WATER RECLAMATION AND RESOURCE RECOVERY (WRRRF) PROJECT**

The **Town of Bennett** (Owner or Town) solicits interested and qualified Supplier firms to submit a proposal for furnishing and delivery of MBR equipment and related services for the Town of Bennett WRRRF Project.

The intent of this RFP is to obtain a firm and binding price proposal. from qualified Suppliers for furnishing services and equipment to meet specifications herein for the MBR System.

**I. GENERAL RFP INFORMATION**

**A. Project Description**

The Town of Bennett (Town) operates a municipal WRRRF permitted for hydraulic and organic capacities of 0.40 million gallons per day (mgd) and 854 pounds per day (ppd) biochemical oxygen demand (BOD<sub>5</sub>), respectively. The WRRRF is located at 805 4<sup>th</sup> Street in the Town of Bennett, Colorado. The facility discharges treated effluent to West Sand Creek, a tributary of Lost Creek per the Colorado Discharge Permit System (CDPS) general discharge permit COG589069 administered by the Colorado Department of Public Health and Environment (CDPHE).

Bennett's lagoon treatment system was upgraded in 2018 to a Sanitaire ICEAS™ Sequencing Batch Reactor (SBR) System. The Town's current WRRRF facility consists of influent flow metering, automatic screening, grit removal, an advanced SBR biological treatment process capable of secondary treatment and biological nutrient removal (BNR), effluent equalization, ultraviolet (UV) disinfection, and biosolids handling using a solids holding tank and dewatering screw press.

The currently proposed facility expansion will increase the total hydraulic capacity to 0.99 mgd maximum month flow and increase the organic capacity to 2,972 ppd BOD<sub>5</sub>. In general, the expanded WRRRF will include the following components:

- Influent lift station.
- Expanded headworks building with fine screening, grit removal, and flow monitoring.
- Re-configured biological secondary treatment.
- Membrane bioreactor (MBR) system.
- In-line ultraviolet (UV) disinfection system.
- Existing aerated sludge holding.
- Existing biosolids dewatering.
- Upgraded electrical, instrumentation, and controls systems.

**B. Proposal Submission Instructions**

Proposal submittals are to be marked **Proposal - MBR System for the Town of Bennett - WATER RECLAMATION AND RESOURCE RECOVERY FACILITY (WRRRF) PROJECT.**

Digital proposal submittals are due before than 3:00 p.m. Mountain Standard Time, November 14, 2022. Proposals received after the time and date above will be considered late and will be rejected without receiving any further consideration. Digital proposals shall be submitted to the Town of Bennett through an emailed link to a supplier-provided Dropbox or other secure file transfer site no later than 3:00 pm Mountain Standard Time November 14, 2022. Suppliers shall email the file transfer link to Daymon Johnson (djohnson@Bennett.co.us) and Sandra Dudley (sandra.dudley@aquaeing.com). Emailed proposals will not be accepted.

Within three business days following digital submission, submit two hard copies of the proposal to Sandra Dudley with AQUA Engineering at 7935 East Prentice Avenue, Suite 100, Greenwood Village, CO 80111. The digital proposal will govern if discrepancies exist between the digital copies and hard copies of the proposal.

It is the sole responsibility of the Supplier that their proposals are acknowledged as received by Owner before the deadline. Proposals and/or any proposal addenda pertaining thereto received after the announced time and date may be rejected.

### **C. Qualifications and General Requirements**

The MBR Supplier shall be experienced, reputable, and qualified to supply the specified equipment and services and must have supplied at least five (5) systems of comparable size and complexity in the United States within the last five (5) years. Only Suppliers listed as acceptable in the MBR equipment specifications (Attachment Two) may provide a proposal.

Owner is exempt from Colorado State Sales and Use Taxes on materials and equipment to be incorporated in the Work (Exemption No. 09805976). All proposals shall exclude sales, use, and any other taxes otherwise collected by the Colorado Department of Revenue.

Proposers are advised to review additional proposal requirements in Section V.

### **D. RFP Requests for Clarification**

Written questions regarding this RFP are allowed and must be received and acknowledged by the Design Engineer at least seven (7) business days before the Proposal submittal deadline. Questions received after this time may not be addressed or answered. Design Engineer contact information follows:

Sandra Dudley, PhD, PE  
AQUA Engineering, Inc.  
[sandra.dudley@aquaeing.com](mailto:sandra.dudley@aquaeing.com)  
720-667-1256

Submitted written questions, and the written responses to questions, will be provided to all Proposers via an Addendum to this RFP.

## **II. SCOPE OF WORK**

### **A. General**

Supplier shall provide to the Town all materials, equipment, services, and training for one complete MBR system, as specified in Attachment Two, Section 465349 – Secondary Treatment Process with Membrane Bioreactor (MBR) System. The Supplier shall also assist the Design Engineer during the design process with

technical information, dimensions, installation requirements/clearances, and other details for an adequate and efficient design suitable for the equipment.

Supplier shall provide new equipment and components, warranted for the minimum warranty period required for each item in the technical specifications provided herein in ATTACHMENTS ONE and TWO.

The MBR Supplier shall provide a Contract Manager who shall be responsible for the performance of the work. The name of this person and an alternate who shall act for the MBR Supplier when the Manager is absent shall be designated in writing as part of this Proposal. The Contract Manager or alternate shall have full authority to act for the MBR Supplier on all contract matters relating to the daily operation of this contract.

## **B. Submittals**

Supplier shall provide submittals, including shop drawings, installation instructions, and operation and maintenance manuals as specified. Formal submittals are required before construction during the design phase of this project. Payment for submittals will be made directly from Owner and will be separate from assignment of the equipment contract with the Contractor.

Within 45 calendar days after Notice of Award (or based on an accepted time proposed by the Supplier in the Contract Schedule Form of this RFP), the Supplier shall submit to Owner for approval complete shop drawings and complete technical submittals. The drawings shall fully demonstrate that the equipment to be constructed will comply with the provisions of these Specifications and shall furnish a true and complete record of the equipment as manufactured and delivered.

The Supplier shall provide written instructions and recommendations with the equipment and approved shop drawings and installation instructions for the Contractor's use in installing the equipment. The Supplier shall furnish installation certificates for Supplier's subcontractors and a certificate stating the equipment has been tested and is correctly installed, properly aligned, ready to be placed in regular operation, and that the final installation will not void Supplier's warranties or guarantees.

Shop drawings and data may be incorporated by the Owner as part of Contract Documents for installation of equipment by a qualified General Contractor.

## **C. Operation and Maintenance Manuals**

At the time of completion of delivery of all equipment, Supplier shall submit to Owner three (3) hard copy sets (bound) and one (1) electronic copy of detailed operation and maintenance manuals for all equipment and components furnished and operation of the equipment. These manuals shall contain all illustrations, detailed drawings, wiring diagrams, and instructions necessary for starting up, operating, and maintaining the equipment. All illustrated parts shall be numbered for identification. All information contained therein shall apply specifically to the equipment and components furnished and shall not include instructions that are not applicable. Photographs, photocopies, and similar types of reproductions shall not be attached to pages. All such illustrations shall be incorporated within the printing of the page to form a durable and permanent reference book.

Manuals shall include start-up, operation, shut down, trouble shooting, and other operating information for operator training and maintenance.

## **D. Field Services**

Refer to the technical specifications for required field services. All service included in the proposal Bid price shall be based on these minimum requirements. If more time is anticipated, indicate how many additional

trips and additional man-days of field service should be added, and provide an adder cost in the provided Exceptions subsection.

The Supplier will provide, in the proposal price, one additional trip to be onsite for two eight-hour days at the six-month date after facility start-up to provide an inspection of the facility, additional operator training, and to assist the operator with reviewing and performance of operations and maintenance.

### **E. Schedule**

The work shall be completed within the number of calendar days listed in the Contract Completion Schedule, as required in Section V.D, commencing on the date of written Notice to Proceed issued to Supplier. Time of delivery will be considered in evaluating the Bids.

## **III. EVALUATION CRITERIA**

The following criteria will be utilized in the evaluation of proposals:

Operability. Addresses the operating and maintenance requirements for the equipment and system. Analysis is based on the equipment as well as operation needs and scheduled preventative maintenance costs. Key items that will be considered for this criterion are as follows:

- Operational complexity, including controls and alarms
- Regularly scheduled, preventative maintenance requirements
- Access for plant personnel to perform routine tasks without disrupting plant operation and without placing the personnel in harm's way.
- Ease and delivery times to obtain recommended spare parts.

Installed Capital Cost. Includes the actual cost of the equipment as well as related and necessary equipment, infrastructure, and Work that affect the total installation cost associated with the equipment.

Operation and Maintenance Costs. The estimated 20-year net present cost of operating expenses and long-term maintenance/capital outlay expenses such as:

- Power consumption.
- Membrane life and periodic replacement costs.
- Chemical use and costs
- Typical routine maintenance hours and costs (per year in addition to 20-year net present cost)
- Costs for wear/replacement parts, both annually and over a 20-year period.
- Other costs anticipated over a 20-year period.

Experience and References. The extent of Supplier's experience on facilities of similar size, complexity, and type of installation. References furnished in proposals will be considered in the evaluation.

- Supplier shall include a list of a minimum of five (5) references, from similar projects only, who could attest to the Supplier's knowledge, quality of work, timeliness, diligence, flexibility, and ability to meet budget constraints, include names, contact persons, and phone numbers of all references.
- References may or may not be reviewed or contacted at the discretion of Owner. Typically, only references of the top ranked shortlist of Supplier or Suppliers are contacted. Owner reserves the right to contact references other than, and/or in addition to, those furnished by a Supplier.

- Inability to contact references due to erroneous or outdated reference contact information may impact the rating score for this evaluation criterion.

Local Service Capability. The location of the nearest service center and Supplier's ability to assist with questions and potential problems. Detailed information shall be provided on the capabilities of the closest service center, what spare parts are stocked there, and method of reaching the service center during business and non-business hours, weekends, and holidays.

Warranties and Guarantee. Favorable results will be given to Suppliers that provide the following:

- Warranty duration.
- Warranties that are not limited by proration.
- Warranties that also include labor and service.
- Warranties that cover all parts and components of a system.
- Effluent performance guarantee for compliance with CDPS discharge permit.

Owner's/Engineer's Preference. The evaluation of this criterion is based on the Owner's and Design Engineer's experience and familiarity with the Supplier's equipment.

## **IV. SELECTION PROCESS AND CONTRACT AWARD**

### **A. General**

The Town and Design Engineer will evaluate each proposal using the evaluation criteria. A rating score between 1 and 5 will be assigned for the evaluation criteria for each proposed item. The score will be multiplied against a weighted value for each item to produce a total score. These scores will be totaled and the proposed item with the highest score will be recommended for selection. Any information that will assist in evaluating the proposals based on the criteria listed above is encouraged. The technical proposal should address all the above items, or the proposal will be considered non-responsive. The Town reserves the right to reject any and all Bids for the items associated with this RFP.

Information and/or factors gathered during interviews, negotiations, and any reference checks, in addition to the evaluation criteria stated in the previous section, and any other information or factors deemed relevant by Owner and Design Engineer, shall be utilized in the selection process.

The proposals will not be opened publicly. Proposals will be considered based on the requirements herein and in consideration of the Town's best interests. The Town reserves the right to award in part or in whole or to reject any or all proposals. Notification of the Town's decision to proceed with the equipment pre-selection and Proposal Award will be given to all proposers as soon as possible.

### **B. Assignment of Contract and Payment Schedule**

The Town will provide a Notice of Award (NOA) and execute a Purchase Order (PO) with the selected Supplier for the Submittals Bid Item Only.

100% of the submittals Bid item will be paid by the Town upon approval of the Submittal Package by the Town and Engineer. This Bid item will be paid by Town and should not be included in other Bid items.



Upon Award, the Town will finalize a procurement contract with the successful MBR Supplier. The Town intends to base its contract on standard EJCDC documents, including Section 00241 – Owner Pre-Purchased Equipment, attached for reference in Attachment 2. The Town will subsequently retain a qualified, certified General Contractor to install the MBR System in its entirety through provisions of the contract with the selected MBR Supplier as well as the contract with the General Contractor. The Town will assign payment by the General Contractor to the selected MBR Supplier as follows:

<b>Item</b>	<b>Percent of Bid Price</b>
Delivery of All Equipment to the Project Site	75%
Submission of Installation Certificate to OWNER	10%
Successful Equipment Start-Up, Test, and Training	10%
Final Payment (35 days after OWNER files Notice of Completion)	5%

Award of Construction Contract and Start of Construction for the project are scheduled to occur in the second quarter of 2023. All Bid items that are awarded as part of this contract, except submittals, will be assigned to the Contractor and written into the construction Bid documents. The estimated startup and operation of the equipment is scheduled to commence first quarter 2026.

**V. PROPOSAL FORMAT AND CONTENT**

**A. General**

Proposals must include fully completed Exceptions, References, MBR Information Sheet, Contract Completion Schedule, and Signature Sheet as well as the Bid Price Form. **Failure to furnish the information required in this section may be cause for rejection of the Bid. Exceptions to any design criteria, specifications or other requirements listed in this RFP must be specifically listed and stated in the RFP on the enclosed Exceptions form.**

Proposal bonds are not required for this pre-selection.

**B. Required Proposal Format**

Submit responses and documentation in the same order as listed below. Clearly separate and identify the sections.

**1. Section 1 – Contract Manager**

Provide name and contact information for a Contract Manager who will serve as the primary Supplier contact.

- Name:
- Title:
- Office address:
- Office Phone Number:
- Mobile Phone Number:
- E-Mail Address:

Name and address of manufacturer and manufacturer's primary contact (if different from that of seller).

## **2. Section 2 - Forms**

The proposal must include all the required forms included as listed below:

- Completed Bid Form/Sheets
- Completed Contract Completion Schedule
- Complete MBR Information Sheets
- Completed Exceptions Form
- Completed Signature Form
- Completed References Form
- Completed Contract Completion Schedule
  - Lead time to prepare and deliver technical submittals and drawings.
  - Lead time to manufacture and deliver equipment to the job site upon receipt of approved submittals.
- Identify and acknowledge receipt of any and all addenda.

## **3. Section 3 - Technical Literature and Information**

- Detailed descriptive literature for all equipment being offered.
- Technical Specifications for proposed equipment (Three Part Specifications).
- Complete Bill of Materials identifying the scope of supply and materials of construction and protective coatings.
- Cut sheets for proposed equipment including motors, instrumentation, valves, actuators, etc.
- Full process calculations, including BioWin or equivalent modeling for the secondary treatment process and nitrogen removal, with specific, detailed sequence of operations of each.
- Complete process flow diagram (PFD) of secondary treatment process and nitrogen removal.
- Drawings depicting (11x17 format):
  - Relevant dimensions and specific footprint and space requirements (including maintenance and service areas),
  - Appropriate cross sections,
  - Location of utility and/or ancillary service or equipment connections.
  - Electrical and instrumentation wiring drawings and requirements.
- Basic description of equipment controls and operating strategies.
- Complete process and instrumentation diagrams (P&IDs) for proposed equipment including ancillary equipment and appurtenances required for a complete operational system.
- List of optional cost adders (credits) for alternate materials of construction, instrumentation, and other accessories.
- List of spare parts and special tools included for year 1 through year 5 (the price for which is provided as a separate line item in the Bid form).
- Standard field testing and operations and maintenance description and schedule.

- Any additional information specifically requested in the Technical Specifications.

**4. Section 4 - Warranty and Service**

- Include written statement that the Supplier will adhere to all warranty provisions required as outlined in the RFP, including technical specifications in Attachment Two.
- Provide a copy of proposed warranty agreement terms and conditions.
- Description and cost of any available extended warranties.
- Local service availability and/or nearest service center.

**5. Section 5 - Preventative Maintenance Schedule and Cost**

- The manufacturer's recommended preventative maintenance schedule for a 20-year service life for each piece of equipment proposed must be included with the proposal in the following format:
  - Maintenance Activity.
  - Specify if the activity can be completed "in house" or at the manufacturer's facility.
  - Frequency of Activity (Daily, Monthly, Annually, etc.).
  - Estimated Manhours required to complete the activity.
  - List of any replacement parts required to complete the 20-year service life, including the current costs and delivery times of each.
- Estimate of annual power, chemical and/or any other consumable cost associated with the equipment operation.

**6. Section 6 - Additional Bid Package Contents**

In addition to the general and cost proposal items listed above, proposal packages must provide the following information:

- Statement of acceptance of payment terms outlined in the RFP. If necessary, include any exceptions and/or clarifications to payment terms.
- Any additional information deemed pertinent for the evaluation criteria listed above.
- Additional Requirements identified and listed in Attachment One.
- Specific requirements identified in Attachment Two – Technical Specifications.
- Statement acknowledging that the scope of supply will include design and calculations for equipment anchoring.

**C. Bid Price Form – Membrane Bioreactor (MBR) System**

The undersigned hereby proposed to furnish and deliver the following items of equipment to Owner, all in strict accordance with the attached and/or incorporated Special Requirements, Technical Specifications, and Drawings, for the following Bid prices:

**Bid Item A** - Furnish one 0.99 MGD MBR System complete with Auxiliary Equipment and appurtenances as specified in Technical Specification, minus controls package:

\$ \_\_\_\_\_ \*(Figures) \$ \_\_\_\_\_ \*(Written)

**Bid Item B** – Furnish one complete controls system package to control both the secondary biological process and MBR System; provide itemized list of equipment:

\$ \_\_\_\_\_ \*(Figures) \$ \_\_\_\_\_ \*(Written)

**Bid Item C** - If included, identify costs for:

Mixers \$ \_\_\_\_\_ \*(Figures) \$ \_\_\_\_\_ \*(Written)

Blowers \$ \_\_\_\_\_ \*(Figures) \$ \_\_\_\_\_ \*(Written)

Diffusers \$ \_\_\_\_\_ \*(Figures) \$ \_\_\_\_\_ \*(Written)

**Bid Item D** - Firm Price for the supply of submittals and manufacturer’s shop drawings  
**(This price is *not* to be included in the equipment price above):**

\$ \_\_\_\_\_ \*(Figures) \$ \_\_\_\_\_ \*(Written)

**Bid Item E** - Firm Price for the supply of the manufacturer’s recommended spare parts not included in the price above (attach list showing individual components and costs):  
**(This price is *not* to be included in the equipment price above):**

\$ \_\_\_\_\_ \*(Figures) \$ \_\_\_\_\_ \*(Written)

**Bid Item F** - Firm Price for taxes for equipment and spare parts (not submittals):  
**(This price is *not* to be included in the equipment price above):**

\$ \_\_\_\_\_ \*(Figures) \$ \_\_\_\_\_ \*(Written)

**\* Owner is exempt from Colorado State Sales and Use Taxes on materials and equipment to be incorporated in the Work (Exemption No. 09805976). Said taxes shall not be included in the Bid. All other applicable taxes by reason of this contract shall be provided in Bid Item F.**

**Bid Item G** - 20-year Firm Price hold for membrane replacement (following membrane delivery):  
**(This price is *not* to be included in the equipment price above):**

\$ \_\_\_\_\_ \*(Figures) \$ \_\_\_\_\_ \*(Written)

**D. Contract Completion Schedule**

<b>Item of Work</b>	<b>Calendar Days for Completion</b>	
	<b>Contract Completion Time (days)</b>	<b>Bidder's Completion Time (days)</b>
1. Price Guarantee (Hold proposal prices following RFP due date).	120*	_____
2. Receipt by Owner of complete Submittal Package	45**	_____
3. Delivery of equipment to the project site: (Complete and Operable Equipment Ready for Installation)		_____

\* Owner will issue a Notice of Award to the selected Supplier. Selected Supplier will be required to honor their submitted Proposal pricing for equipment delivery, installation, and warranty for the required period from the proposal due date for this RFP. If the "Price Guarantee" time is exceeded before agreement with Contractor, price escalation shall be allowed as follows: Price adjustment will be based on the net change of the Consumer Price Index for Urban Consumers (CPI-U) occurring in the period from 288 consecutive calendar days from the proposal due date to the date when the Purchase Order is issued by the Contractor.

\*\* Commencing on Date of "Notice to Proceed" issued by Owner during the design phase of the project. Owner will transmit a "Notice to Proceed" to Supplier upon receipt by Owner of an executed Agreement, including insurance. Thereafter, the Supplier shall commence with the preparation of the Submittal Package. Payment will be provided by OWNER upon review and approval of submittals. Submittals will be reviewed during the 60% design phase and used to inform the 60% design. Approved submittals will be returned to Supplier following the 60% design phase.

Work shall be completed per the Contract Completion Time, unless Alternate Completion Times, herein referenced as "Bidder's Completion Time", are proposed by Bidder, as set forth herein, and are approved by Owner.

### E. Membrane Bioreactor (MBR) System Information Sheet

General Design Information		
Total Usable Membrane Area		ft <sup>2</sup>
Number of Trains (At least 4)		Each
Number of Modules per Train		Each
Surface Area per Module		ft <sup>2</sup>
Flux Rate @ Max Month Flow (one train offline)		gal/ft <sup>2</sup> /day
Maximum Allowable Flux Rate for 24-hour duration		gal/ft <sup>2</sup> /day
Maximum Design Transmembrane Pressure		psig
Membrane Basin Dimensions		ft x ft x ft
Cleaning Process - Provide for Each Chemical Required (attach additional sheets as needed)		
Type of Chemical		--
Frequency of cycles		no. per week or month
Volume of chemical required		gal/cycle
Type of Chemical		--
Estimated Frequency of cycles		no. per week or month
Volume of chemical required		gal/cycle
Other Design Parameters		
Estimated Labor		hours/week
Additional Basin Volume Required		cy
Concrete Required for Additional Basins		cy
Estimated Permeate Pump Power (Total)		kWh/day
Maximum Air Volume Required for Scour (per train)		scfm
Minimum Air Volume Required for Scour (per train)		scfm
Maximum Air Volume Required for Scour (Total)		scfm
Air Pressure Required for Scour		psig
Scour Air Compressor Power Requirements		kWh/day
Process Oxygen Uptake Rate (OUR)		LB/day
Actual Oxygen Required (AOR) for Secondary Process		LB/day
Secondary Process Mixers, if provided		QTY, RPM, HP
Guaranteed Membrane Life		months
Membrane Replacement Cost		--
Other Annual Replacement Costs (specify)		--

## Statement of Conformance

Suppliers must include **all** proposed costs for performance under the contract. Suppliers must provide all personnel and other resources required to complete the contract. Suppliers are solely responsible for start-up and transition expenses. Any costs that cannot be determined, based on the available information, should be indicated and explained.

Does Proposed Equipment meet **All** of the Specifications? \_\_\_\_\_

If No, make notations on Exceptions sheet.

### **SIGNATURE**

I hereby certify that I am authorized to sign as a Representative for the Supplier:

Name of Firm: \_\_\_\_\_

Address: \_\_\_\_\_

Fed ID No.: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Telephone (\_\_\_\_) \_\_\_\_\_

Fax No. (\_\_\_\_) \_\_\_\_\_

Email: \_\_\_\_\_

Date: \_\_\_\_\_

My signature certifies that the proposal as submitted complies with all Terms and conditions as set forth in RFP.

\_\_\_\_\_  
Representative Signature

My signature also certifies that this firm has no business or personal relationships with any other companies or persons that could be considered a conflict of interest or potential conflict of interest to OWNER, pertaining to any and all work or services to be performed as a result of this request and any resulting contract with OWNER.

**To receive consideration for award, this signature sheet must be included with the Bid form for each item.**

## **F. Exceptions**

State below any and all exceptions that you are taking to any portion of this Request for Proposals. If not addressed below, Owner then assumes that the Supplier will adhere to all terms and conditions as contained in the proposal document. Supplier is responsible to reconcile, at vendor cost, any exceptions not listed in this section. Provide additional lines or sheets if required.



**G. References**

Please list below name of business, address, telephone number, and contact person.

1. \_\_\_\_\_  
\_\_\_\_\_

---

2. \_\_\_\_\_  
\_\_\_\_\_

---

3. \_\_\_\_\_  
\_\_\_\_\_

---

4. \_\_\_\_\_  
\_\_\_\_\_

---

5. \_\_\_\_\_  
\_\_\_\_\_

## **ATTACHMENT ONE – ADDITIONAL INFORMATION SHEET**

### **A. Appropriations**

Pursuant to C.R.S. § 29-1-110, as amended, financial obligations of the Town after the current fiscal year are contingent upon funds for the purpose being appropriated, budgeted and otherwise available. Any contract entered with respect to this project will provide that it is automatically terminated on January 1st of the first fiscal year for which funds are not appropriated.

### **B. Agreement Required**

A written agreement will be required between Owner and the selected Supplier, which agreement will be in the form and substance required by Owner.

### **C. Insurance**

The Supplier shall purchase and maintain in force, at its own expense, any such insurance that may be required pursuant to the agreement between Owner and Supplier, which may include insurance during shipment and Supplier provided onsite services.

### **D. Responsibility Of Supplier**

Supplier shall accept risk of loss responsibility until all of the following have been completed: (i) the equipment is delivered to the Project site and examined by Owner, Contractor, and Supplier's representative; (ii) the equipment is found to be in suitable condition and properly prepared for storage; and (iii) the equipment is formally accepted by Owner as set forth herein.

In accordance with generally accepted practices for the type of work to be performed by the Supplier, the Supplier will be solely and completely responsible for conditions of the job site for which the Supplier is responsible, including safety of all persons and property during performance of the work according to federal, state, and local regulations.

Equipment being furnished and delivered, including components, materials, fabrication, and delivered product, shall be subject to rigid inspection by Owner and Contractor. Owner may at Owner's expense visit the manufacturing facility to inspect the equipment during fabrication. Supplier shall maintain a current monthly schedule of fabrication and be prepared for unannounced inspection by Owner. Supplier shall cooperate with Owner to readily permit said rigid inspection by Owner.

### **E. Site Characteristics**

Site Elevation:	5,485 feet MSEL
Maximum Temperature:	100° F
Minimum Temperature:	-10° F
Average Annual Precipitation:	15 inches

### **F. Permits, Certificates, Laws, Ordinances, Fees, and Royalties**

Supplier shall, at his own expense, procure all permits, certificates, and licenses required of him by law for the execution of the work. He shall comply with all Federal, State, and local laws, ordinances, or rules and regulations relating to the performance of said work.

Supplier shall pay all royalty or license fees for use of patented devices or systems and shall protect Owner from patent infringement litigation thereon.

## **G. Responses to RFP**

All proposals shall become the property of the Town upon receipt and will not be returned to the Supplier. Selection or rejection will not affect this right. Any confidential/proprietary information submitted in response to this request shall be readily identified, clearly marked and separated from the rest of the response. Co-mingling of confidential/proprietary and other information is not acceptable. Submittals will be handled in accordance with applicable federal and state public records laws and procurement regulations. Neither cost information nor the total proposal will be considered confidential/proprietary.

## **H. Rejection Rights**

The Town reserves the right to reject all proposals and re-solicit if deemed by the Town to be in its best interests, and to abandon the Project and this RFP at any time for any or no reason. The Town is not obligated to accept the lowest cost proposed, is not obligated to accept any Proposal, and will make its determination based on the best interests of the Town.

## **I. Other Conditions; Reservation of Rights**

This is a solicitation and not an offer to contract. The provisions in this RFP and any procurement or purchasing policies or procedures of the Town are solely for the fiscal responsibility of the Town and confer no rights, duties, or entitlements to any party submitting responses to this solicitation. The Town reserves the right to issue clarifications and other directives concerning this RFP, to make and issue modifications to the RFP schedule; to require clarification or further information with respect to any response or proposal received; to waive any informalities or irregularities; and to determine the final scope and terms of any contract, and whether to enter any contract. The provisions herein confer no rights, duties or entitlements to any Supplier.

## **J. Supplier's Responsibilities**

Suppliers shall make all investigations necessary to thoroughly inform themselves regarding the Project and are expected to examine the drawings, specifications, schedule of delivery, and all instructions. Failure to do so is at the risk of the Supplier.

## **K. Costs of Response Preparation and Other Charges**

Suppliers are solely responsible for all costs of preparing their proposals and participation in this RFP, and the Town assumes no responsibility for payment of any expenses incurred by a Supplier as part of this process. For the selected firm, no reimbursement will be made by the Town for any costs incurred prior to full execution of a contract and issuance of written notice by the Town to commence Project services.

## **L. Taxes**

Suppliers shall not include federal, state, or local excise or sales taxes in prices offered, as the Town is exempt from payment of such taxes. Town tax identification numbers will be made available to the selected contractor.

## **M. No Collusion**

Supplier, by affixing its signature to this RFP, certifies that its Proposal is made without previous understanding, agreement, or connection either with any persons, firms or corporations making a Proposal for the same items, or with the Town. Supplier also certifies that its Proposal is in all respects fair, without outside control, collusion, fraud, or otherwise illegal action. To ensure

integrity of the Town's public procurement process, all Suppliers are hereby placed on notice that any and all Suppliers who falsify the certifications required in conjunction with this section will be prosecuted to the fullest extent of the law.

**N. Equal Opportunity**

The Town intends and expects that the contracting processes of the Town and its vendors provide equal opportunity without regard to gender, race, ethnicity, religion, age or disability and that its vendors make available equal opportunities to the extent third parties are engaged to provide goods and services to the Town as subcontractors, vendors, or otherwise. Accordingly, the vendor shall not discriminate on any of the foregoing grounds in the performance of the contract, and shall make available equal opportunities to the extent third parties are engaged to provide goods and services in connection with performance of the contract.

## **ATTACHMENT TWO – PRELIMINARY EQUIPMENT SPECIFICATIONS**

A. SECTION 465349 SECONDARY TREATMENT PROCESS WITH MEMBRANE BIOREACTOR (MBR) SYSTEM

B. PRELIMINARY SUPPLEMENTAL TECHNICAL SPECIFICATIONS

SECTION 013300	CONTRACTOR SUBMITTALS
SECTION 016600	EQUIPMENT TESTING AND PLANT STARTUP
SECTION 017500	COMMISSIONING
SECTION 017700	CLOSEOUT PROCEDURES
SECTION 017823	OPERATION AND MAINTENANCE DATA
SECTION 098000	PROTECTIVE COATINGS
SECTION 220513	COMMON MOTOR REQUIREMENTS FOR EQUIPMENT
SECTION 262419	MOTOR CONTROL CENTERS
SECTION 262923	VARIABLE-FREQUENCY MOTOR CONTROLLERS
SECTION 400559	SLIDE AND WEIR GATES
SECTION 400557	ACTUATORS FOR PROCESS VALVES AND GATES
SECTION 400559	SLIDE AND WEIR GATES
SECTION 400562	PLUG VALVES
SECTION 400564	BUTTERFLY VALVES
SECTION 400567	BALL VALVES
SECTION 409000	INSTRUMENTATION CONTROL FOR PROCESS SYSTEMS
SECTION 409113	CHEMICAL PROPERTIES PROCESS MEASUREMENT DEVICES
SECTION 409123	MISCELLANEOUS PROPERTIES PROCESS MEASUREMENT DEVICES
SECTION 409433	HUMAN MACHINE INTERFACES
SECTION 409443	PROGRAMMABLE LOGIC CONTROLLERS
SECTION 409513	PROCESS CONTROL PANELS AND HARDWARE
SECTION 409600	PROCESS CONTROL SOFTWARE

**SECTION 465349 – SECONDARY TREATMENT PROCESS WITH  
MEMBRANE BIOREACTOR (MBR) SYSTEM**

PART 1        GENERAL

1.1        GENERAL

A. This is a performance specification outlining design criteria, submittal and scope of supply expectations, and other performance-based requirements for the Town’s RFP. This specification is intended to provide general process and equipment parameters and guidelines. It is Supplier’s responsibility to define the most cost-effective approach and scope of supply to satisfy the specification.

1. Supplier shall provide one (1) membrane bioreactor (MBR) system and associated equipment, material, systems, and services.
2. In lieu of the Owner provided Secondary Treatment, Supplier may provide its own complete or partial Secondary Treatment Process with MBR design and scope of supply.
3. Suppliers shall complete the RFP Bid Forms as necessary.
4. See Section 2.4 Scope of Supply paragraph and RFP Section II Scope of Work for general information.

B. Additional Information and Requirements

1. The existing SBR concrete basins shall be used in the proposed secondary treatment process design. Reference attached drawings of the existing SBR system. Supplier has the option to reuse/repurpose the Town’s existing ICEAS SBR components and infrastructure, including the following:
  - a. Existing effluent equalization basin
  - b. Existing mixers, blowers and diffusers
  - c. Existing SBR decanters
  - d. Existing pumps
  - e. Existing sludge holding tank
2. MBR system shall consist of hollow-fiber type membrane technology.
3. Provide with Proposal a guaranteed membrane replacement cost for the 20-year design life of this project and replacement costs, including the expected life cycle of membranes. The guaranteed membrane replacement cost shall be from the membrane manufacturer and shall include all markup costs from the System Supplier.
4. MBR system will be designed to operate as an integrated process. The MBR Supplier shall assist, coordinate and provide all required information to the Town’s integrator to provide a fully functional and integrated system.
5. The overall treatment process may include chemical addition upstream of the membrane system, including alkalinity and carbon supplementation for achieving low nitrogen

limits. The Supplier shall confirm and document that membrane systems are compatible with anticipated chemicals.

C. Codes and Standards

In addition to specific standards and codes noted in technical specifications, the Supplier shall comply with the latest editions of the following codes and standards as the minimum when furnishing the work covered under these specifications:

1. American National Standards Institute (ANSI)
2. American Society of Civil Engineers (ASCE)
3. American Society for Testing and Materials (ASTM)
4. American Water Works Association (AWWA)
5. Hydraulic Institute Standards (HI)
6. American Society of Mechanical Engineers (ASME)
7. American Welding Society (AWS)
8. National Electrical Code (NEC)
9. Underwriters Laboratories, Inc. (UL)
10. Institute of Electrical and Electronic Engineers (IEEE)
11. National Electrical Manufacturers Association (NEMA)
12. American Institute of Steel Construction (AISC)

1.2 SUBMITTALS

A. Submittals are not required with MBR Proposal.

B. Submit in accordance with Section 013300 – Contractor Submittals.

C. Action Submittals/Informational Submittals: Supplier shall submit to Owner for approval complete technical and informational submittals including, but not be limited to, the following:

1. Name, address, phone number and email address of equipment and motor manufacturers.
2. Name, address and phone number of closest service representative(s).
3. Equipment information
  - a. Descriptive literature, brochures, catalogs, cut sheets, specifications, and other detailed descriptive material.
  - b. Plans and elevations showing details, sizes, dimensions, and required spacing of all equipment, and locations of sole plates, anchor bolts, jacking devices, supports, anchor tie rods, turnbuckles, and all other devices used for supporting and anchoring the equipment and components.
  - c. Equipment performance curves.
  - d. Process flow diagram (PFD).
  - e. Full calculations of membrane flux, oxygen scour requirements, and other operational parameters of the MBR system.

- f. Drawings, weights, static and dynamic loads, and all other information necessary for the design of the equipment foundations, structures, and connections for lubricating, cooling, and piping required for equipment furnished.
  - g. Usage, size, type, manufacturer, and complete description of all electric motors, gear drives, impellers, gates, and mounting details.
  - h. Detailed instructions for unloading, storing, and protecting all equipment during storage.
  - i. Anchoring requirements and anchor bolt calculations developed and stamped by a professional structural engineer licensed in the State of Colorado.
  - j. Equipment specific loadings and reactions required for foundation and support structure design.
  - k. Materials used for the fabrication of the various components of the equipment to be furnished including thickness and ASTM designation where applicable.
  - l. Surface finishes and protective coatings.
4. Electrical, Instrumentation and Controls
- a. Process and instrumentation diagrams (P&ID's) showing a complete and functional system with all required instrumentation and auxiliary equipment.
  - b. Wiring and schematic diagrams showing required external connections. All wiring terminations shall be identified with terminal numbers. Interconnect diagrams for all equipment and filter controls.
  - c. Required control signal inputs and outputs
  - d. Control narrative and description of operating strategy. At a minimum this should include a description of startup, normal operation, shutdown and standby operation for given equipment or system.
  - e. Details, sizes, and locations of all connections for external piping, wiring, and conduit.
  - f. Motor performance chart including torque, current, power factor, input/output kilowatts and efficiency. Include data on starting and no-load characteristics.
5. Shop drawings including
- a. Detailed drawings.
  - b. Anchorage patterns.
  - c. Assembly weights.
  - d. Dimensions.
  - e. Calculations.

D. Closeout Submittals

- 1. Operation and maintenance data in accordance with Section 017823 – Operations and Maintenance Data.
  - a. List of troubleshooting actions.
  - b. Parts list, including a list of recommended spare parts.
  - c. Maintenance Material Submittals:
    - 1) Parts list and included spare parts list.
    - 2) Extra stock materials.
    - 3) Any special tools required for maintaining equipment.
  - d. Warranty documentation:
    - 1) Printed warranty in accordance with Section 01 78 36 – Warranties.
    - 2) Record documentation.
    - 3) Software.



### 1.3 WARRANTY

A. Provide with Proposal the Supplier's proposed membrane and system warranty. Membrane warranties shall be based on system being capable of processing average and peak flows as described herein during the warranty period while operating the plant according to normal operation and maintenance practices for the system. If system is incapable of processing average or peak flow rates during the warranty period, the membranes shall be replaced and installed by the Supplier at no cost to the Owner. This information is required to estimate the 20-year life cycle costs associated with membrane replacement.

B. Manufacturer shall warrant the equipment against defects in workmanship and materials for a period of at least two years from date of the first beneficial use. The manufacturer's warranty shall be in published form and shall apply to all similar units.

## PART 2 PRODUCTS

### 2.1 ACCEPTABLE MEMBRANE MANUFACTURERS

- A. Subject to compliance with the Contract Documents, the following are acceptable:
1. Suez ZeeWeed Membrane
  2. Koch Puron<sup>®</sup> Membrane

### 2.2 DESIGN CRITERIA

A. Influent Design Parameters:

<b>Influent Design Parameter</b>	<b>Units</b>	<b>Value</b>
Maximum Month Flow (MMF)	MGD	0.99
Peak Day Flow (PDF)	MGD	1.86
Peak Hour Flow (PHF)	MGD	3.76
BOD <sub>5</sub>	mg/L	360
TSS	mg/L	250
TKN	mg/l	75
NH <sub>3</sub> -N	mg/L	50
Total Phosphorus (TP)	mg/L	10
Average Influent Alkalinity	mg/L	523
Minimum Wastewater Temperature	C°	12
Maximum Wastewater Temperature	C°	28

B. Effluent Design Parameters (at full range of wastewater temperatures):

<b>Effluent Design Parameter</b>	<b>Units</b>	<b>Value</b>
BOD <sub>5</sub>	mg/L	<5.0
TSS	mg/L	<5.0
NH <sub>3</sub> -N	mg/L	<1.0

Total Inorganic Nitrogen (TIN)	mg/L	<10.0
Minimum Effluent Alkalinity	mg/L	100
Required Effluent Turbidity	NTU	<0.2

C. Secondary/Membrane Design Parameters:

Design Parameter*	Units	Value
Maximum MLSS Concentration (in bioreactor)	mg/L	12,000
MBR Flux Rate @ MMF and 12 °C	gpd/ft <sup>2</sup>	10.0

\*In addition, comply with all requirements of CDPHE WPC-DR-1 *Design Criteria for Domestic Wastewater Treatment Works*, including 7.5.0 Membrane Bioreactor Secondary Treatment. Any exceptions must be clearly noted.

D. Other Design Parameters:

1. Scope of supply as described in Part 2.4 below and the Town’s RFP for MBR, dated October 27, 2022.
2. Both the secondary process and MBR system shall be designed with redundancy:
  - a. If the Supplier’s Proposal includes option 2.4.C. below, the secondary process shall be designed with capacity to pass the PHF (hydraulically, not treatment capacity) with one train offline.
  - b. MBR systems shall be provided with multiple modules in a minimum of four trains. The PDF shall be treated with one train offline for at least 24 hours.

2.3 QUALITY ASSURANCE

A. Membrane Suppliers shall meet the following requirements:

1. Manufacturer shall supply references and contact information for previous installations of the same membrane product. Reference list shall include installation date, length of operating time since installation and average effluent BOD<sub>5</sub> and nitrogen concentrations.
2. Evidence that the Supplier has at least five (5) operating installations where the type of membrane system proposed for this project has been in successful operation for at least five years with similar design, operational, and effluent requirements.

2.4 RFP PROPOSAL SCOPE OF SUPPLY

A. Below is general guidance for scope of supply. Proposals shall follow the RFP Section II--Scope of Work, clearly identify Owner and Supplier scopes of supply, and include the RFP Bid Form and other required forms, completed as required by the RFP.

B. Supplier shall provide one (1) MBR system and associated equipment, material, systems, and services.

1. Owner will provide:
  - a. Influent screening and grit.

- b. Secondary treatment process design (A2O process or similar, including concrete, requirements for process and scour blowers, diffusers, mixers, and any equipment necessary to meet effluent design parameters and CDPHE *Design Criteria for Domestic Wastewater Treatment Works Policy WPC-DR-1*).
  - c. Alkalinity and carbon supplementation, if necessary.
  - d. Secondary effluent feed to the MBR system.
  - e. Disinfection, RAS and WAS pumping from MBR tank to bioreactor and solids holding tank, respectively, and sludge dewatering. Supplier will supply design criteria, including pump duty points, for RAS and WAS pumps.
  - f. Concrete basins for MBR system and new building to house equipment (MBR, chemical feed and storage, permeate pumps, and other ancillary equipment).
2. Supplier shall identify and provide the following in the Proposal:
- a. Screening and grit removal requirements.
  - b. MBR system, including but not limited to, pumps, membranes, valves, air compressor, membrane cleaning chemical feed, and instrumentation and controls.
  - c. Recommendations for secondary feed to the MBR system and acceptance of MBR permeate.
  - d. MBR system design parameters (dimensions, volumes, layouts, cutsheets).
  - e. Other equipment design parameters (dimensions, volumes, layouts, cutsheets).
  - f. Chemical, washwater, scour air, and other requirements.
  - g. Limits to the scope of supply (for example, aeration pipe point of connection by others, chemical feed equipment included, etc.)
  - h. Ancillary equipment to be provided by Owner (for example, bridge cranes, permeate tank, etc.)
  - i. Estimated annual and 20-year O&M costs. Provide sufficient details on equipment provided so the O&M costs can be calculated. Include connected HP (or kw) for supplied equipment along with chemical quantities required for cleaning or maintenance. Suppliers shall complete the information form provided at the end of this section.

C. In lieu of the Owner-provided Secondary Treatment, Supplier may provide its own Secondary Treatment Process design and scope of supply.

- 1. Supplier shall provide a complete system treating wastewater to the Design Criteria specified herein and shall submit with Proposal a complete RFP Bid Form.
- 2. Supplier provided secondary treatment scope of supply is described below. Supplier shall identify and provide the following in the Proposal:
  - a. All equipment necessary for complete treatment system meeting effluent design parameters and *Design Criteria for Domestic Wastewater Treatment Works Policy WPC-DR-1*, including but not limited to, pumps, mixers, diffusers, process and scour air blowers, decanters, membranes, valves, air compressor, membrane cleaning chemical feed, and instrumentation and controls. The Supplier shall identify and note any existing equipment proposed to be reused and list in the proposal any additional equipment that will be required.
  - b. Supplier shall provide recommendations or requirements for:
    - 1) Screening and grit removal.
    - 2) Feeding screened and dewatered wastewater to the secondary process and accepting MBR permeate for disinfection.

- 3) Additional process basin volume, if necessary.
  - 4) MBR system design parameters (dimensions, volumes, layouts, cutsheets).
  - 5) Other equipment design parameters (dimensions, volumes, layouts, cutsheets).
  - 6) Chemical, washwater quantity and characteristics, other requirements.
  - 7) Limits to the scope of supply (for example, aeration pipe point of connection by others, chemical feed equipment included, etc.)
  - 8) Ancillary equipment to be provided by Owner (for example, bridge cranes, permeate tank, etc.)
  - 9) Estimated annual and 20-year O&M costs. Provide sufficient details on equipment provided so that the O&M costs can be calculated. Include connected HP (or kw) for supplied equipment along with chemical quantities required for cleaning or maintenance. Suppliers shall complete the information form provided at the end of this section.
- c. Supplier shall identify the limits to the scope of supply (for examples, aeration pipe point of connection by others, chemical feed equipment included, etc.)
3. Owner will provide:
- a. Influent screening and grit removal.
  - b. Disinfection, RAS and WAS pumping from MBR tank to bioreactor and sludge holding tank, respectively, and sludge dewatering. Supplier will supply design criteria, including pump duty points, for RAS and WAS pumps.
  - c. Alkalinity and carbon supplementation equipment.
  - d. Additional process basin concrete recommended by Supplier.
  - e. Concrete basins for MBR system and new building to house equipment (MBR, chemical feed and storage, permeate pumps, bridge crane, and other ancillary equipment).

## 2.5 MEMBRANE SYSTEM REQUIREMENTS

A. Supplier shall provide membranes and all associated equipment including but not limited to membrane module frames, including any necessary tank grating/planking supports, permeate piping, permeate pumps, pressure gauges and transmitters, membrane cleaning systems, aeration and other equipment for membrane scour cleaning, redundant air compressors with dryers and filters, turbidimeter, and necessary valves and actuators.

1. The membrane Supplier shall list the OEM of all major components above.
2. Membrane pore size shall be no greater than 0.04  $\mu\text{m}$ .
3. Permeate piping shall be Sch 10, 316 stainless steel, and scour air piping shall be Sch 10, 304 stainless steel.
4. Permeate pumps, including chemical cleaner injection valves, pressure gauge and switch, drain valves, and other necessary equipment for operation of the permeate pump.
5. Chemical cleaning system, including chemical feed pumps, piping and valves, chemical storage tanks (if required), quantity of make-up water (if required), specifications of

necessary membrane dipping tanks (if required), and controls needed for regular and intermittent cleaning of the membranes.

6. Valves specific to membrane system.
7. If necessary, membrane air scour blowers and associated air scour valves and equipment.
8. Pneumatic valve compressors and associated valves and equipment.
  - a. All automated control valves are to be equipped with pneumatic actuators. Supplier shall include a fully redundant air compressor system including redundant compressors, dryers and filters. A redundant storage tank is not necessary. The Supplier shall be responsible for sizing the compressor system for all air flows required as part of the membrane system.
9. For equipment that is integral to the successful operation of the MBR but provided by others, provide specifications of such equipment.

B. Supplier shall provide complete control package to control both the secondary biological process and MBR system. Control package shall include control panel(s), VFD motor starters, and other aspects of the control system. Supplier shall itemize the scope of supply and cost of control system package separate from other system equipment, and it will be included as a separate line item in the Supplier's Bid form. A comprehensive control narrative is required.

1. All transmitters shall be provided with an indicating display.
2. If the transmitter is submersible or in a location that is not convenient for viewing, a separate external display shall be supplied.

C. All motors shall be premium efficient, inverter duty, TEFC with Class F insulation supplied at 3-phase 460V. Each motor shall be supplied with thermal overloads. Refer to Section 220513 – Common Motor Requirements for Equipment.

D. Materials of construction for all components shall be suitable for the environment in which they will typically operate. Materials in contact with chemicals or wastewater must be resistant to contact with chemicals or wastewater.

E. All equipment to be furnished under this Specifications shall be furnished with all necessary embedment items, anchor bolts, nuts, washers, soleplates, structural steel supports, anchor tie rods, turnbuckles, jacking pads, leveling jacks, and other material necessary for anchoring the equipment to the foundations. Supplier shall furnish loading and anticipated reactions for equipment to allow Engineer to properly design foundation and support structures.

F. The equipment furnished under this Specification shall operate as quietly as practical design considerations permit. Design and construction shall be conducted to reduce the noise to a minimum at the WRRRF and surrounding community.

## PART 3 EXECUTION

### 3.1 TESTING

- A. Supplier shall conduct factory testing and verification of equipment prior to shipment. Testing shall demonstrate correct alignment, smooth operation and freedom of excessive vibration and noise of all equipment. Test period shall demonstrate accurate measurement of sensors and function of run sequences.
- B. Refer to Section 016600 and Section 017500.
- C. RELIABILITY ACCEPTANCE TESTING (RAT)
  - 1. The purpose for the RAT is for the Supplier and Contractor to demonstrate that all systems are capable of operating continuously in the intended manner for an extended period without failing. During the RAT, the Supplier will monitor and assist the Contractor for recording all readings, collecting all samples and conducting laboratory analysis. During the RAT, the system test will be operated within design parameters reflecting the day-to-day operation of the facilities for an uninterrupted period of 30 days. Several systems may have to test simultaneously in order to confirm and document adequate treatment of the wastewater.

### 3.2 START-UP FIELD SERVICES

- A. Start-up services shall be provided by the supplier of the entire system, as well as OEMs of the following (at a minimum):
  - 1. Secondary treatment equipment, if necessary.
  - 2. Permeate pumps
  - 3. Turbidimeter assemblies
  - 4. Chemical dosing skids
- B. The MBR supplier shall include (as a minimum) following field services:
  - 1. Verification of installation, alignment, and strain on suction and discharge connections and certification = 1 Trip (5 Days).
  - 2. Start-up, Training and Commissioning Services (Functional Acceptance Testing) = 1 trip (10 Days), including Training Plan and Commissioning Services Plan for Town's review and approval.
  - 3. Support services during Reliability Acceptance Testing = 1 Trip (10 Days).
  - 4. Owner may elect to increase or decrease the number of days for the services in items 1-3 for a total of 25 days support, the itemized cost to be noted in the Supplier's proposal.

END OF SECTION

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