



EXHIBIT A
CITY OF COOPER CITY
MEMBRANE REPLACEMENT
TASK ORDER No. 2021-01
SCOPE OF SERVICES
AUGUST 27, 2021

PROJECT BACKGROUND

The CITY has operated the existing Membrane Water Treatment Plant (WTP) for over 25 years. The WTP is configured with four membrane skids. Two skids are rated for a capacity of 1.5 mgd and loaded with 245 membrane elements. The other two skids are rated for a capacity of 2.0 mgd and loaded with 350 membrane elements.

The membrane skids have demonstrated successful operation for many years. However, the membranes are approaching the end of their useful life and replacement is recommended to improve water quality and for energy savings.

The CITY requested that Hazen and Sawyer (CONSULTANT) review the suitability and performance of the current membranes and other similar products with demonstrated performance on the southeast Florida Biscayne aquifer supply. The CITY requested that CONSULTANT develop a technical memorandum (TM) outlining membrane selection and procurement recommendations. CONSULTANT shall also assist the CITY in developing bid documents and provide membrane bidding assistance and oversight, as needed during installation and start-up. The CITY has also requested the CONSULTANT to provide assistance with other miscellaneous upgrades to the membrane treatment system.

SCOPE OF SERVICES

The Scope of Work to be performed includes the following major elements:

- Review the suitability and performance of the current membranes and other similar products available in the market with demonstrated experience treating a south Florida Biscayne aquifer supply;
- Define the membrane requirements and potential suppliers and assist in communications with vendors to review membrane projections and specifications;
- Provide recommendations for membrane procurement and regulatory compliance;
- Provide assistance to procure membrane autopsy services from a qualified vendor to determine scaling and fouling concerns and establish an improved membrane cleaning protocol;
- Develop design documents to add an additional pressure vessel to the second stage of each membrane skid (including feed, permeate and concentrate modifications);
- Develop design documents to add an automatic SDI testing apparatus for the raw water supply;

- Develop design documents for replacement of the manual interstage permeate throttling valve;
- Prepare technical bid documents for procuring the new membrane elements, membrane skid modifications, membrane installation services, replacement of the interstage permeate throttling valve and the concentrate check valve for each skid; replacement of one automatic silt density index (SDI) apparatus
- Assist the City during bidding including attending a pre-bid conference and providing clarifications of contract documents (limited to technical content only), and general bidding assistance; and
- Assist the City with project oversight, as needed, during membrane replacement and start-up, including logging membrane element loading sequence and correlation with wet test data.

The CITY has requested CONSULTANT provide these services as detailed in the following scope of work.

TASK 1 – MEMBRANE REPLACEMENT TECHNICAL MEMORANDUM

CONSULTANT shall review the suitability and performance of the current membranes and other similar products available in the market for treating a south Florida Biscayne aquifer supply. CONSULTANT shall identify potential membrane suppliers, those who have demonstrated successful, ongoing treatment of south Florida Biscayne aquifer supply, and review the available products and compatibility.

CONSULTANT shall request and review membrane projections of potential membrane element manufacturers to compare expected permeate water quality and operating conditions. Membrane projections shall assume that the final pressure vessel is added to the second stage of each membrane skid.

CONSULTANT shall outline membrane requirements, installation requirements and develop a membrane specification. CONSULTANT shall provide recommendations for typical permitting and regulatory compliance. CONSULTANT shall provide a preliminary opinion of probable project cost for membrane replacement. CONSULTANT shall summarize recommendations for membrane selection and procurement in a brief TM.

TASK 2 – MEMBRANE SKID MODIFICATIONS DESIGN AND CONTRACT DOCUMENT DEVELOPMENT

CONSULTANT shall develop design documents for the addition of the final pressure vessel in the second stage of each skid. CONSULTANT shall develop design documents for replacement of the manual interstage permeate throttling valve in each skid. CONSULTANT shall also develop design documents to add an automatic SDI testing apparatus for the raw water supply. This design shall include the following details:

- General requirements specification
- Pressure vessel specification
- Membrane skid upgrades specification, including membrane element replacement
- Stainless steel pipe specification
- Valve specification(s)
- Interstage permeate valve specification
- Concentrate check valve specification

- Testing and startup specification
- Automatic SDI apparatus specification
- Membrane skid upgrade plans or schematics
- Feed installation port detail
- Permeate collection port installation detail
- Concentrate collection port installation detail
- Interstage valve replacement detail
- Concentrate check valve replacement detail

CONSULTANT shall develop a preliminary set of technical plans and specifications. CONSULTANT shall transmit to the CITY for review. CITY shall review and provide comments for incorporation.

CONSULTANT shall revise the set to incorporate CITY review comments and send final documents electronically for bidding.

TASK 3 – MEMBRANE BIDDING, INSTALLATION, AND START-UP SERVICES

CONSULTANT shall provide the following services during bidding, installation, and start-up on an as-requested basis by the CITY:

- Attend pre-bid meeting with prospective bidders;
- Assist with preparation of and issue addenda as appropriate to interpret or clarify contract documents (limited to technical content only);
- Record membrane loading sequence and correlate to wet test data;
- Assist the CITY with project oversight, as needed, during membrane replacement and start-up; and
- Develop Power BI Dashboard to interface with data collection of new membrane elements

CITY's responsibilities during bidding, installation, and start-up include the following:

- Prepare front end documents;
- Reproduce, advertise and distribute bid documents;
- Maintain a list of bidders;
- Issue addenda to bidders;
- Verify references for apparent low bidder and make a recommendation to Procurement Department; and
- Communications with membrane suppliers and installers and project management

TASK 4 – MEMBRANE AUTOPSY PROCUREMENT ASSISTANCE

CONSULTANT shall provide assistance to the CITY to procure membrane autopsy services from a qualified vendor. The results of the autopsy will be used to evaluate improvements to the current

membrane cleaning protocols. CONSULTANT will review the autopsy reports with the CITY and will discuss recommendations to improve membrane cleaning.

TASK 5 – ADDITIONAL OPTIONAL SERVICES

CONSULTANT shall provide assistance to the CITY on an as-needed basis up to the limits of this task. Services provided under this task shall be related to this scope of services but not defined here-in.

ASSUMPTIONS

The following assumptions were made in preparation of the level of effort associated with the described scope:

1. CITY will provide existing records of previous membrane performance and operating conditions.
2. Pilot testing of pretreatment chemicals is not included. It is assumed that the CITY will continue the current sulfuric acid dosage and pretreatment chemical type and dosage.
3. Pilot testing of membrane elements is not included. Only membrane elements with demonstrated performance in Southeast Florida (on Biscayne Aquifer wellfield supply) will be considered.
4. The optimization of skid performance is not included. The design will follow the original skid design.
5. CITY will prepare front end contract language for incorporation into the bid package.
6. Permitting requirements and communications with regulatory agencies will be the responsibility of the CITY.
7. The CITY will pay for all permitting and testing fees.
8. CITY will perform all bid review and award services.

SCHEDULE

The schedule for the major work tasks is summarized below.

Task	Description	Duration for task/subtask (days)	Calendar Days From Notice To Proceed
1	Membrane Replacement Technical Memorandum	60	60
2	Membrane Skid Modifications Design and Contract Document Development	60	90
3	Membrane Bidding, Installation and Start-up Services*	150	240
4	Membrane Autopsy Procurement Assistance	60	240
5	Additional Optional Services	300	300

* Assumes 60 days for bid and award.

COMPENSATION

Compensation shall be made to CONSULTANT for a lump sum amount of \$56,906 as summarized below.

Task	Description	Compensation Type	Estimated Fee
1	Membrane Replacement Technical Memorandum	Lump Sum	\$13,045
2	Membrane Skid Modifications Design and Contract Document Development	Lump Sum	\$19,991
3	Membrane Bidding, Installation and Start-up Services	Time and Materials	\$10,830
4	Membrane Autopsy Procurement Assistance	Lump Sum	\$3,040
5	Additional Optional Services	Time and Materials	Up to \$5,000
		Reimbursables	Up to \$5,000
TOTAL			\$56,906

SUBMITTED BY:

Hazen and Sawyer

BY:  _____

Janeen M. Wietgreffe, Associate Vice President

Dated this __27th__ day of _August_____, 2021

APPROVED BY:

City of Cooper City

BY: _____

Joseph Napoli, City Manager

Dated this __ day of _____, 2021