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www.freese.com

June 30, 2023

Mr. Esteban Ramos
Water Resource Manager
City of Corpus Christi
PO Box 9277
Corpus Christi, TX 78469

Re: US Bureau of Reclamation Title XVI Funding Support for Seawater Desalination

Dear Mr. Ramos,

At your request, Freese and Nichols, Inc. (FNI) is pleased to submit our proposal for a professional services contract to provide support for the pursuit of Title XVI grant funding through the US Bureau of Reclamation for the City's Seawater Desalination Project. The scope of work and fee summary are attached.

Please feel free to contact me at 361.561.6500 should you have any questions regarding this matter.

Sincerely,

A handwritten signature in blue ink, appearing to read 'R. Guzman'.

Ron Guzman, PE
Vice President/Principal

Attachments: Exhibit SC, Manhour Breakdown.

CITY OF CORPUS CHRISTI SEAWATER DESALINATION FEASIBILITY STUDY REPORT
ATTACHMENT SC
Scope of Work

The City of Corpus Christi is the regional water supplier for over 500,000 people in the Coastal Bend Region of Texas. It is home to a major Port, a significant portion of the Texas and National refining capacity, rapidly growing mid-stream and export facilities and operations as well as major military missions. The City has been assessing desalination as a potential new water source since the early 1980s. In 2004-2005, Corpus Christi was one of three sites selected by a State program sponsored by then Governor Rick Perry to jump-start seawater desalination in Texas. For various reasons, none of these previous projects came to fruition. The time just was not right.

More recently, the drought of 2010-2014, brought to the forefront the need to diversify the regional water supply portfolio and to specifically consider seawater desalination. In 2015, recognizing the strategic importance of a drought-proof water supply, the City, along with major industrial water users, the Regional Economic Development Corporation, the Port of Corpus Christi and San Patricio Municipal Water District partnered to conduct a feasibility study of seawater desalination for the region. Upon concluding the feasibility study, the City secured Texas Water Development Board financial assistance and engaged in additional planning and permitting efforts focused on implementing seawater desalination production facilities. The first of these facilities would be installed on the Corpus Christi Inner Harbor Channel. A second facility would be constructed on the La Quinta Channel contingent upon increasing regional water demands.

The City would like to participate in Title XVI Program funding under section 4009(c) of the Water Infrastructure Improvements for the Nation (WIIN) Act. Eligibility for this program requires completion and approval by US Bureau of Reclamation of a feasibility study report prepared in compliance with Title XVI WaterSmart's Water Infrastructure Improvements for the Nation, Desalination Construction Program, Reclamation Manual, Directives and Standards, WTR 11-01 and WTR TRMR-128 related to Large-Scale Water Recycling Program Feasibility Study Projects.

This scope of work will document the planning efforts and prepare any required supplemental information to prepare and deliver a feasibility study report that meets the aforementioned guidance and requirements. Completion of the grant application is also included in the Basic Services.

BASIC SERVICES

1. US Bureau of Reclamation Title XVI Feasibility Study

The following task breakdown includes the effort necessary to complete the feasibility study as defined in Reclamation Manual, Directives and Standards, WTR 11-01 for Title XVI Feasibility Studies with the necessary modifications to address and WTR TRMR-128 requirements.

A. Project Management and Coordination

- i. Provide document control and coordination with City throughout the life of the project; these include:
 - a) Meeting agendas,
 - b) Meeting minutes,
 - c) Action items, and
 - d) Decisions log
- ii. Provide written project status reports to City once per month throughout the duration of the project (effort included under technical tasks).
- iii. Compile a digital repository of relevant planning information generated in support of seawater desalination and other water supply alternatives for Corpus Christi, including:
 - a) Padre Island Desalination Plant Feasibility Study, City of Corpus Christi (2003);
 - b) Large-Scale Demonstration of Seawater Demonstration of Seawater Desalination, City of Corpus Christi (2004);
 - c) Variable Salinity Desalination Demonstration Project, various reports, City of Corpus Christi (2014 through 2017);
 - d) Industrial Seawater Desalination, Project Definition Package (Draft), City of Corpus Christi (2016);
 - e) State Water Implementation Fund for Texas, Financial Assistance Application, City of Corpus Christi;
 - f) Responses to City of Corpus Christi Request for Information;
 - g) 2021 Region N Water Plan;
 - h) Technical Memoranda generated under the City's Seawater Desalination Owner's Representative Contract with Freese and Nichols, Inc.
 - i) Alternative seawater desalination study (Barney Davis site) report;
 - j) Aquifer storage and recovery study;
 - k) Water reuse study;
- iv. Implement Quality Control and Quality Assurance Plans for deliverables (effort included under technical tasks).

- v. Meetings: Up to three (3) members of the FNI team will attend the following meetings with City:
 - a) Project kick-off;
 - b) One meeting with US Bureau of Reclamation
 - c) Workshop presentation of draft Feasibility Study Report;

B. Project Identifiers

The Consultant will address the following:

- i. identification of project sponsor(s)
- ii. description of the study area and an area/project map; and
- iii. definition of the study area in terms of both the site-specific project area and where the reclaimed, recycled or desalinated water supply will be needed and developed, and any reclaimed or desalinated water distribution systems.

C. Statement of Problems and Needs

The Consultant will address the following:

Describe key water resource management problems and needs for which a water reclamation, recycling or desalination project will provide a solution, including the following information. All projections shall be reasonable and applicable for a minimum of 20 years.

- i. Description of the problem and need for a reclamation, recycling or desalination project.
- ii. Description of current and projected water supplies, including water rights, and potential sources of additional water other than the proposed water desalination project, and plans for new facilities other than the proposed project, if any.
- iii. Description of current and projected water demands, including a description of the current and projected water supply and demand imbalances.
- iv. Description of any water quality concerns for the current and projected water supply.

D. Water Reclamation and Reuse Opportunities

The Consultant will:

Address the opportunities for water reclamation, recycling and desalination in the study area, and identify the sources of water that could be reclaimed or desalinated, including the following information.

- i. Description of all uses for reclaimed or desalinated water, or categories of potential uses, including, but not limited to, environmental restoration, fish and wildlife, groundwater recharge, municipal, domestic, industrial, agricultural, power generation, and Recreation. Identify any associated water quality, and associated treatment requirements.
- ii. Description of the water market available to utilize reclaimed or desalinated water, including:
 - a) Identification of existing and potential users, expected use, peak use, on-site conversion costs if necessary, desire to use reclaimed, recycled or desalinated water, including letters of intent if available.
 - b) Description of any consultation with potential reclaimed, recycled or desalinated water customers. Letters of intent must be included, if applicable.
 - c) Description of the market assessment procedures used.
- iii. Discussion of considerations (for example: physical, converting systems for reused water, or public acceptance) which will prevent implementing a water reclamation, recycling or desalination project. Identify methods or community incentives to stimulate reclaimed, recycled or desalinated water demand, and methods to eliminate obstacles which will inhibit the use of reclaimed, recycled or desalinated water, including pricing.
- iv. Identification of all the water and wastewater agencies that have jurisdiction in the potential service area or over the sources of reclaimed, recycled or desalinated water.
- v. Description of potential sources of water to be reclaimed, recycled or desalinated, including impaired surface and ground waters.
- vi. Description and location of the source water facilities, including capacities, existing flows, treatment processes, design criteria, plans for future facilities, and quantities of impaired water available to meet new reclaimed, recycled and desalinated water demands.
- vii. Description of any current water reclamation, recycling or desalination taking place in the study area, including a list of reclaimed water uses, type and amount of reuse, and a map of existing pipelines and use sites.
- viii. Description of current and projected wastewaters and disposal options other than the proposed water reclamation, recycling or desalination project, and plans for new wastewater facilities, including projected costs, if any.
- ix. Summary of any water reclamation, recycling and desalination technology currently in use in the study area, and opportunities for development of improved technologies.

E. Description of Alternatives

The Consultant will address the following:

- i. Description of the baseline condition without the proposed project or any of the alternatives.
- ii. Description of the non-Federal funding condition. The reasonably foreseeable future actions that the non-Federal project sponsor would take if Federal funding were not provided for the proposed water reclamation, recycling or desalination project, including estimated costs.
- iii. Statement of the specific objectives all alternatives, including the water reclamation, recycling or desalination project, are designed to address.
- iv. Description of waste-stream discharge treatment and disposal water quality requirements, if applicable, for the proposed water reclamation, recycling or desalination project.
- v. Description of one or more alternative technologies that could be used in the proposed water reclamation, recycling or desalination project under consideration. Where a project only consists of reclaimed, recycled or desalinated water distribution, alternative plans for distribution or implementation will be provided. These alternatives must be approvable by the state(s) or tribal authorities in which the project will be located.
- vi. A description of a reasonable range of viable alternatives that would satisfy the same water demand as the proposed project, including other water supply sources and/or project types that are practicable, feasible, and meet the planning objectives.
- vii. Alternative plans will clearly identify and evaluate the trade-offs among stakeholders and resources. The viability of an alternative will be determined through an evaluation of its acceptability¹, efficiency², effectiveness³, and completeness⁴. Alternative plans will be formulated based on most likely future conditions expected with and without implementation of a plan.
- viii. Consideration of the impact of climate change in the trade-off analysis and the comparison of alternatives.

¹ Acceptability: the viability and appropriateness of an alternative from the perspective of the Nation's general public and consistency with existing Federal laws, authorities, and public policies. It does not include local or regional preferences for particular solutions or political expediency.

² Efficiency: the extent to which an alternative alleviates the specified problems and realizes the specified opportunities at the least cost.

³ Effectiveness: the extent to which an alternative alleviates the specified problems and achieves the specified opportunities.

⁴ C completeness: the extent to which an alternative provides and accounts for all features, investments, and/or other actions necessary to realize the planned effects, including any necessary actions by others. It does not necessarily mean that alternative actions need to be large in scope or scale.

F. Economic Analysis

The Consultant will address the following:

A water reclamation, recycling or desalination feasibility study report must include an economic analysis of the proposed water reclamation, recycling or desalination project relative to other water supply alternatives that could be implemented by the non-Federal project sponsor in lieu of a water reclamation, recycling or desalination project. This assessment needs to identify the degree to which the water reclamation, recycling or desalination project alternative is cost-effective, and the economic benefits that are to be realized after implementation. The study lead must submit the following information for the economic analysis in a water reclamation, recycling or desalination feasibility study report.

- i. Description of the conditions that exist in the area and provide projections of the future with, and without, the project. Emphasis in the analysis must be given to the contributions that the plan could make toward meeting the future water demand in an efficient and economically sound manner.
- ii. Compile recent and relevant references for unit costs for materials and equipment for the cost model inputs;
- iii. Review trends and relevant project costs in the seawater desalination market;
- iv. Update capital and operations & maintenance (O&M) cost projections including a full update to the FNI cost model to provide a summary including the water cost per thousand gallons of finished water.
- v. Identification of all project-related costs for the selected water reclamation or recycling project and the alternatives identified. Costs must be provided for all planning, design, and construction activities as well as operations and maintenance costs. Cost estimates must be presented in terms of pay items, quantities, unit prices, contract costs, non-contract costs, and escalation. Cost estimates for the final analyzed alternatives shall be at a sufficient design level to conduct the comparisons required in subsection (d). Cost estimates shall include:
 - a) Pay Items – Abbreviated descriptions of work for which payments or charges to accounts are made. Pay items represent a logical and practical breakdown of the proposed work into separate and distinct classes of work.
 - b) Quantities – The quantities for pay items shall be presented by a number and a unit of measure such as pounds, cubic yard, or another unit that most appropriately represents the measurement for the particular pay item.
 - c) Unit Prices – Current unit prices shall be used in all estimates and identified.
 - d) Contract Cost – The contract cost represents the estimated cost of the contract at time of bid or award and will include allowances for design contingencies and for procurement strategies, but not construction contingencies.
 - e) Non-Contract Cost – Costs associated with work or services provided in support of the project, these may include project management, investigations

- and data collection, construction management, environmental compliance, and archeological considerations.
- f) Escalation – For projects that are to be developed over an extended period of time, or at some distant time in the future, estimates may account for escalation that may occur.
 - vi. Identification, quantification, and monetization of benefits, both direct use benefits and indirect use benefits, for the selected project and the alternatives identified. Benefits may include, but are not limited to, benefits related to water supply, recreational benefits, ecosystem benefits, water quality, energy efficiency, public health and other social benefits, and/or avoided costs.
 - vii. A comparison of the benefits and costs associated with the selected water reclamation or recycling project and the alternatives identified. The results of this comparison should be discounted to net present value. The alternative plan that reasonably maximizes net public benefits will be identified.
 - a) This comparison must result in a benefit cost ratio that is provided for the selected project and the alternatives.
 - b) Discussion about the extent to which the selected project maximizes benefits must be included.
 - viii. Some water reclamation, recycling or desalination project benefits will be difficult to quantify; for example, a drought tolerant water supply, reduced water importation, and other social or environmental benefits. These benefits shall be documented and described qualitatively as completely as possible. Any qualitative benefits will be considered as part of the justification for a water reclamation, recycling or desalination project in conjunction with the comparison of project costs described above.
 - ix. A summary, in one table of the net present value of monetized benefits and costs, and the listing and ranking of the benefits described qualitatively.

G. Selection of the Proposed Water Reclamation, Recycling or Desalination Project

The Consultant will address the following:

- i. Provide a justification of why the proposed water reclamation, recycling or desalination project is the selected alternative in terms of meeting objectives, demands, needs, cost effectiveness, and other criteria important to the decision.
- ii. Provide an analysis and, if applicable, an affirmative statement of whether the proposed water reclamation, recycling or desalination project would address the following:
 - a) reduction, postponement, or elimination of development of new or expanded water supplies;
 - b) reduction or elimination of the use of existing diversions from natural watercourses, or withdrawals from aquifers;

- c) reduction of demand on existing Federal water supply facilities; and
- d) reduction, postponement, or elimination of new or expanded wastewater facilities.

H. Environmental Consideration and Potential Effects

The Consultant will address the following:

The review of a water reclamation, recycling or desalination feasibility study report does not require National Environmental Policy Act (NEPA) compliance. The Department of the Interior categorical exclusion 1.11 “Activities which are educational, informational, advisory, or consultative to other agencies, public and private entities, visitors, individuals or the general public” applies to Reclamation’s consultative review, and preparation of the water reclamation, recycling or desalination feasibility study reports. As stated in Paragraph 1. Scope, Reclamation is not making a recommendation to go forward with the proposed water reclamation, recycling or desalination project, nor is Reclamation using the water reclamation, recycling or desalination feasibility study report to propose an action to the Congress.

The water reclamation, recycling or desalination feasibility study report must include sufficient information on the proposed water recycling or desalination project to allow Reclamation to assess the potential measures and costs that will be necessary to comply with NEPA, and any other applicable Federal law. Accordingly, the following information is required:

- i. Discussion whether, and to what extent, the proposed water reclamation, recycling or desalination project will have potentially significant impacts on endangered or threatened species, public health or safety, natural resources, regulated waters of the United States, or cultural resources.
- ii. Discussion whether, and to what extent, the project will have potentially significant environmental effects, or will involve unique or undefined environmental risks.
- iii. Description of the status of required Federal, state, tribal, and/or local environmental compliance measures for the proposed water reclamation, recycling or desalination project, including copies of any documents that have been prepared, or results of any relevant studies.
- iv. Any other information available to the study lead that would assist with assessing the measures that will be necessary to comply with NEPA, and other applicable Federal, state or local environmental laws such as the Endangered Species Act or the Clean Water Act.
- v. Discussion of how the proposed water reclamation, recycling or desalination project will affect water supply and water quality from the perspective of a regional, watershed, aquifer, or river basin condition.

- vi. Discussion of the extent to which the public was involved in the feasibility study, and a summary of comments received, if any.
- vii. Description of the potential effects the project will have on historic properties. Discussion must include potential mitigation measures, the potential for adaptive reuse of facilities, an analysis of historic preservation costs, and the potential for heritage education, if necessary.
- viii. If, at a later date, Reclamation provides funds for construction, all appropriate NEPA and other environmental and cultural compliance must be completed prior to any ground disturbing activities beginning in order for the project to be eligible.

I. Legal and Institutional Requirements.

The Consultant will address the following:

The water reclamation, recycling or desalination feasibility study shall identify any legal or institutional requirements, or barriers to implementing the proposed project.

- i. Analysis of any water rights issues potentially resulting from implementation of the proposed water reclamation, recycling desalination project. All proposed water reclamation, recycling or desalination projects must comply with state water law.
- ii. Discussion of legal and institutional requirements (e.g., contractual water supply obligations, Indian trust responsibilities, water rights settlements, regional water quality control board requirements), state, and/or local requirements with the potential to affect implementation of the project. Water reclamation, recycling or desalination projects using Reclamation project water must address contractual requirements as described in RM D&S, Reuse of Bureau of Reclamation Project Water (PEC 05-09).
- iii. Discussion of the need for multi-jurisdictional or interagency agreements, any coordination undertaken, and any planned coordination activities.
- iv. Discussion of permitting procedures required for the implementation of water reclamation, recycling or desalination projects in the study area, and any measures that the non-Federal project sponsor can implement that could speed the permitting process.
- v. Discussion of any unresolved issues associated with implementing the proposed water reclamation, recycling or desalination project, how and when such issues will be resolved, and how the project would be affected if such issues are not resolved.
- vi. Identification of current and projected wastewater discharge requirements resulting from the proposed water reclamation, recycling or desalination project (e.g., brine disposal).

- vii. Description of rights to wastewater discharges resulting from implementation of the proposed water reclamation, recycling or desalination project.

J. Financial Capability of Sponsor.

The Consultant will address the following:

At the water reclamation, recycling or desalination feasibility study stage, Reclamation must request enough information to determine that the non-Federal project sponsor is likely to demonstrate financial capability if the project moves to construction. Reclamation will request more detailed information to make a determination that the non-Federal project sponsor is financially capable of funding the non-Federal share of the project's costs before a funding agreement covering construction can be executed. Accordingly, the following information is required to be included in the water reclamation, recycling or desalination feasibility study report.

- i. Proposed schedule for project implementation.
- ii. Discussion of the willingness of the non-Federal project sponsor to pay for its share of capital costs and the full operation, maintenance, and replacement costs.
- iii. A plan for funding the proposed water reclamation, recycling or desalination project's construction, operation, maintenance, and replacement costs, including an analysis of how the non-Federal project sponsor will pay construction and annual operation, maintenance, and replacement costs.
- iv. Description of all Federal and non-Federal sources of funding and any restrictions on such sources, for example, minimum or maximum cost-share limitations. Generally, for water reclamation, recycling or desalination projects, the Federal cost share is limited to 25 percent, or \$30,000,000, whichever is less.

K. Research Needs

The Consultant will address the following:

At a minimum, the report must include a statement on whether the proposed water reclamation, recycling or desalination project includes basic research needs, and the extent that the proposed project will use proven technologies and conventional system components. The following information is required only if further research is necessary to implement the proposed water reclamation, recycling or desalination project:

- i. Description of research needs associated with the proposed water reclamation, recycling or desalination project, including the objectives to be accomplished through research;
- ii. Description of the basis for Reclamation participation in the identified research;

- iii. Identification of the parties who will administer and conduct necessary research;
and
- iv. Identification of the timeframe necessary for completion of necessary research.

2. Preparing and Filing the Reclamation Grant Application

The Consultant will:

- i. Prepare a draft application for the Title XVI grant under section 4009(c) of the Water Infrastructure Improvements for the Nation (WIIN) Act
- ii. Meet with the City of Corpus Christi to review the draft application
- iii. Update the application and provide a final copy of the document(s) for the City's review prior to submitting the application to Reclamation.
- iv. Monitor the application processing
- v. Assist the City with grant award contract preparation

ADDITIONAL SERVICES

Additional services may be scoped and budgeted based on request from City. Such scope items may include:

- Surveys
- Geotechnical Investigations
- Environmental Reviews, Studies, or Surveys

RESPONSIBILITIES OF OWNER

1. Identify, engage, and coordinate with peer reviewer(s), if required by Reclamation. Provide FNI with a description of the technical expertise and affiliation of the reviewer(s) and a summary of the comments provided during the review.

COMPENSATION

Freese and Nichols, Inc. proposes to perform the Scope of Services listed above for a lump-sum fee detailed in the compensation table below.

Basic Services Project Task	Fee
1. Title XVI Feasibility Study	\$160,813
2. Reclamation Grant Application	\$59,704
Total	\$220,517

SCHEDULE

FNI is authorized to commence work on the Project upon execution of this Agreement.

If FNI's services are delayed through no fault of FNI, FNI shall be entitled to adjust the contract schedule consistent with the number of days of delay. These delays may include but are not limited to delays in Client or regulatory reviews, delays on the flow of information to be provided to FNI, etc.

Milestone	Expected Date / Completion
Project Kickoff Meeting	August 2023
IH SWD Project Cost Estimating Update	December 2023
Draft Title XVI Feasibility Report & City Review	March 2024
Final Title XVI Feasibility Report & Reclamation Submittal	June 2024

City of Corpus Christi Seawater Desalination - Title XVI 6/30/2023 Detailed Cost Breakdown	Project Fee Summary	
	Basic Services	\$ 220,517
	Special Services	\$ -
	Total Project	\$ 220,517

Phase	Task	Activity	Basic or Special	Tasks Task Description	Labor														Total Hours						
					Jorge Arroyo	Ron Guzman	Jason Cocklin	Dhruv Deshmukh	Natalie Rodriguez	Tom Dixon	CJ Sellers	David Buzan	Mike Morrison	Lisa Boggs	Marissa Mendoza	Mark Evans	Katie Leatherwood	Kendall King							
					APM	CR	PM	PE	EIT	ES	ES	Senior ES	Tech Lead	Contracts	Acct	Funding	TPDES	SA							
				Project Management and Coordination																					
				a. Provide document control and coordination	8		5								4	4									8
				b. Compile a digital repository of relevant planning information					4																4
				c. Implement Quality Control and Quality Assurance Plans and peer review of interim and final products	10	4	6							4							4				28
				d. Meetings	20			20	6				2						4						52
I				Title XVI Feasibility Report Required Content																					
				A. Project Identifiers	4				4																8
				B. Statement of Problems and Needs	12			2	4																18
				C. Water Reclamation and Reuse Opportunities	24			2		4															30
				D. Description of Alternatives	40				8	24															72
				E. Economic Analysis	64			36	72	64					8										244
				F. Selection of the Proposed Title XVI Project.	20			2	4																26
				G. Environmental Consideration and Potential Effects	16			2			4	16	12	2											52
				H. Legal and Institutional Requirements	20			2			4			2							4	2			30
				I. Financial Capability of Sponsor	8																				12
				J. Research Needs	8																				8
II				Desalination-WIN Financial Assistance Application																					
				(a) Draft Application, Meeting, Application Updates, Final Application	88	1	24		88																201
				(b) Assist with grant award contract preparation	12			4	12																28
				Total Hours / Quantity	354	5	105	198	98	8	16	14	16	4	4	8	2	4	-	-	-	-	-	-	834