



Gulf Coast Water Authority
Regional Seawater Desalination
Feasibility Study

Response to Bureau of Reclamation Notice of
Funding Opportunity No. R23AS00076

WaterSMART: Water Recycling and
Desalination Planning

February 27, 2023

Table of Contents

Federal forms [to be filed electronically]	iii
A. SF-424: Application for Federal Assistance.....	iii
B. SF-424A: Budget Information - Non-Construction Programs	iii
C. SF-424B: Assurances for Non-Construction Activities	iii
D. SF-LLL: Disclosure of Lobbying Activities (if applicable)	iii
I. Technical proposal	1
A. Executive summary	1
a. Applicant identification	1
b. Project summary.....	1
c. Project duration.....	1
d. Federal land	1
B. Project location	2
C. Project description.....	2
a. Applicant Category	2
b. Eligibility of Applicant	2
c. Goals	2
d. Approach	3
II. Responses to evaluation criteria.....	4
A. Evaluation Criterion 1 – Project planning and analysis (30 Points)	4
a. Subcriterion No.1a – Water Recycling Needs and Opportunities (15 Points).....	4
b. Subcriterion No.1b – Evaluation of Project Alternatives (15 Points)	9
B. Evaluation Criterion 2 – Stretching Water Supplies (20 points)	10
C. Evaluation Criterion 3 – Environment and Water Quality (20 points)	13
D. Evaluation Criterion 4 – Department of the Interior Priorities (15 points)	14
E. Evaluation Criterion 5 – Watershed Perspective and Stakeholder Involvement (15 Points)	17
F. Evaluation criteria compliance summary	19
III. Project budget.....	21

A.	Funding plan.....	21
B.	Budget proposal.....	21
C.	Budget narrative	21
D.	Letters of funding commitment (if applicable).....	22
IV.	Required permits or approvals (recommended).....	22
V.	Official resolution (recommended; will not count toward the page limit).....	22
VI.	Letters of support for the project and letters of participation (recommended, will not count toward the page limit).....	22
VII.	Overlap or duplication of effort statement (recommended).....	22
VIII.	Uniform audit reporting statement (recommended).....	22
IX.	Conflict of interest disclosure statement (recommended).....	22
X.	References	23

Federal forms [to be filed electronically]

A. SF-424: Application for Federal Assistance

A fully completed SF-424: Application for Federal Assistance form signed by **a person legally authorized to commit the applicant to performance of the project** must be submitted with the application. The SF-424 must contain a valid Unique Entity Identifier (UEI). See D.3 for additional information. Applications that fail to include a SF-424 will be considered ineligible and will not pass initial screening.

If the request is more than \$100,000 in Federal funding: must certify that all statements in 43 CFR Part 18, Appendix A-Certification Regarding Lobbying are true. The Authorized Official's signature on the appropriate SF-424, Application for Federal Assistance form represents the entity's certification of the statements in [43 CFR Part 18, Appendix A](#).

B. SF-424A: Budget Information - Non-Construction Programs

C. SF-424B: Assurances for Non-Construction Activities

D. SF-LLL: Disclosure of Lobbying Activities (if applicable)

If applicable, a fully completed and signed SF-LLL: Disclosure of Lobbying Activities form is required if the applicant has made or agreed to make payment to any lobbying entity for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a covered Federal action. **This form cannot be submitted by a contractor or other entity on behalf of an applicant.**

A representative from the GCWA completed and signed a SF-LL: Disclosure of Lobbying Activities form electronically in the grant application, as required.

I. Technical proposal

A. Executive summary

The Gulf Coast Water Authority (GCWA or Authority) is a major water provider to municipal, manufacturing, and irrigation users in the San Jacinto-Brazos Coastal and Lower Brazos River Basins in Texas. GCWA operates three divisions that are responsible for providing water supply for industry, agriculture, and municipalities in Brazoria, Fort Bend, and Galveston Counties, located in the Greater Houston area. GCWA has recognized seawater desalination as a potential alternative for meeting current and future treated water needs within its service area. Also, because of the end-of-basin location of the Authority's service area and its wide network of water transmission and distribution infrastructure, a large-scale of seawater desalination creates opportunities for leveraging existing water resources through conjunctive water resource management, which would further enhance the regional water supply portfolio.

a. Applicant identification

February 27, 2023. Gulf Coast Water Authority (GCWA or Authority), Texas City, Texas.

b. Project summary

GCWA's goal is to ensure a drought-proof water supply portfolio that contributes efficiently to the region's resilience against climate change driven droughts. Therefore, in this study the Authority proposes to define and assess the feasibility of implementing a large-scale seawater desalination project. The study will examine the potential regional impact such new supply would have when conjunctively managed with existing surface (river) water resources.

The study will begin with a stakeholder process to gauge regional interest and receive input pertaining seawater desalination. Modeling of the existing water supply portfolio will be performed to determine the appropriate volume of seawater desalination and the timing for its implementation. A seawater desalination project will be formulated and compared against reasonable alternatives previously generated in local and regional water planning efforts. This information will serve as the basis for the Title XVI Feasibility Study Report.

Regarding how the proposed study activities may contribute to accomplishing the goals and objectives of this funding opportunity, the purpose of the feasibility study is to evaluate the development of a large-scale regional seawater desalination supply which is consistent with the goals stated in the Notice of Funding Opportunity No. R23AS00076NOFO.

c. Project duration

The estimated time to prepare and deliver the feasibility study is 12 months.

d. Federal land

None of the anticipated facilities will involve Federal land.

Gulf Coast Water Authority
Regional Seawater Desalination Feasibility Study

B. Project location

The Authority is a wholesale water provider for agriculture, industry, and municipalities in Brazoria, Fort Bend, and Galveston counties, which are in the Greater Houston area along the Texas Gulf Coast (**Figure 1**). The Authority's headquarters are located in Texas City, TX. The proposed study will identify and evaluate potentially feasible locations for the seawater desalination facility within or in near proximity to the GCWA system service area.

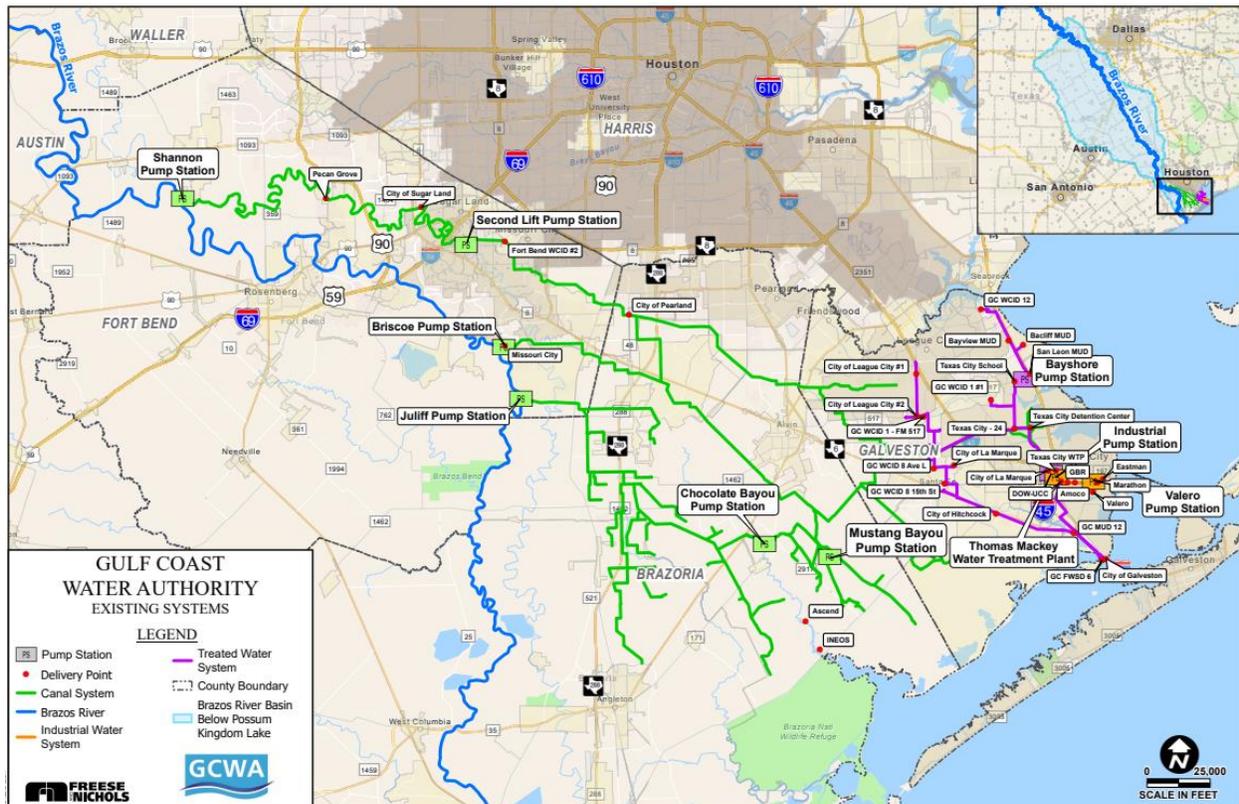


Figure 1 – Project Location, Gulf Coast Water Authority System Map

C. Project description

a. Applicant Category

GCWA is seeking funding under the Funding Group I Category to conduct planning activities to define and evaluate the feasibility of a large-scale, regional seawater desalination project.

b. Eligibility of Applicant

GCWA is a water district in the State of Texas.

c. Goals

The goal of the proposed activities is to define a large-scale seawater desalination project, evaluate its feasibility, and chart a path for its implementation. If the project is determined to be feasible, GCWA anticipates pursuing financial assistance under the Water Infrastructure Improvements for the Nation (WIIN) Act.

d. Approach

The approach to this study is to: 1) determine the scale of seawater desalination that would address water supply needs of the GCWA and the multiplying impact this new supply would have on the regional water supply portfolio; 2) select a site for a desalination plant and define the technical aspects of the desalination facility; 3) screen, update, and select competing water supply alternatives; and 4) prepare a report addressing Title XVI feasibility requirements. The study will address the following tasks:

Stakeholder Outreach - GCWA will begin this project by convening a stakeholder outreach process to seek input, collaboration, and potential partners for developing a seawater desalination supply with a regional scope. Consultation sessions will be conducted throughout the planning process to engage stakeholders on the progress of the study.

Water needs assessment – The study will assess water needs and explore the impact that a seawater desalination supply would have on the GCWA system. Specifically, the study will identify raw Brazos River water potentially made available to the region through the implementation of a desalination facility. The deliverable from this task will be a definition of the volume and timing for implementing the proposed seawater desalination supply.

Seawater desalination facility – A site selection process will be conducted to identify and screen potential sites, select and evaluate candidate sites, and choose a preferred site. Site selection criteria will include technical, environmental, social considerations and permitting viability. Once the site is selected, the major components of the seawater desalination project will be determined, and a feasibility level life-cycle cost estimate will be prepared.

Project Alternatives – The Region H Water Plan and GCWA planning studies, as well as others that might be identified in the stakeholder outreach process will be reviewed to identify alternative water management strategies that could potentially meet GCWA’s goal and specific objectives. Competing alternatives will be selected through a screening process and their life-cycle costs updated to provide for a meaningful comparison with the seawater desalination project.

Title XVI Feasibility Report – A report will be prepared to address the guidance and requirements of Reclamation Manual WTR 11-01. A workshop will be scheduled to present the draft report and solicit comments. The report will be revised as needed and a final delivered to Reclamation for review and approval consideration

II. Responses to evaluation criteria

A. Evaluation Criterion 1 – Project planning and analysis (30 Points)

a. Subcriterion No.1a – Water Recycling Needs and Opportunities (15 Points)

i. Problems and needs

GCWA is uniquely situated in a critical location for providing water supplies to a mixture of municipal, industrial, and irrigation demands in the Greater Houston metropolitan area. The Authority’s 315-miles of canals convey water from three diversion points along the Brazos River to provide the majority of the water supplied to meet demands across three counties. The lower Brazos River basin is subject to high levels of demand due to urban growth and extensive demand associated with the petrochemical industry in both Texas City and Freeport.

The 2021 Region H Regional Water Plan projects nearly 36,000 acre-feet per year of supply deficit by the year 2070 within GCWA’s existing service area (Region H Water Planning Group, 2021). These needs are shown below in **Table 1**. At a regional level, approximately 228,305 acre-feet per year of unmet needs are projected to occur by year 2070 in river basins relevant to the GCWA service area (**Table 2**), part of which GCWA would be in a position to serve through their system. **Figure 2** illustrates the Region H Planning Area and river basins relevant to the GCWA service area.

Table 1 – Projected Unmet Water Needs for GCWA, 2021 Region H Regional Water Plan (Acre-Feet per Year)

	2020	2030	2040	2050	2060	2070
Industrial	632	9,654	10,127	10,307	10,520	10,769
Municipal	2,809	11,496	11,800	15,251	18,430	24,926
Total	3,441	21,150	21,927	25,558	28,950	35,695

Table 2 – Projected Unmet Water Needs for River Basins Relevant to GCWA, 2021 Region H Water Plan (Acre-Feet per Year)

River Basin	2020	2030	2040	2050	2060	2070
Brazos	1,840	19,173	20,876	24,528	29,455	34,955
San Jacinto-Brazos	66,082	101,503	114,472	124,243	136,114	148,548
Brazos-Colorado	21,910	28,713	30,732	33,983	38,442	44,802
Total	89,832	149,389	166,080	182,754	204,011	228,305

Over and above, these known demands, GCWA routinely receives requests for increased industrial water supplies that are limited by existing sources of surface water, indicating an even higher need for new water supplies.

Gulf Coast Water Authority
Regional Seawater Desalination Feasibility Study

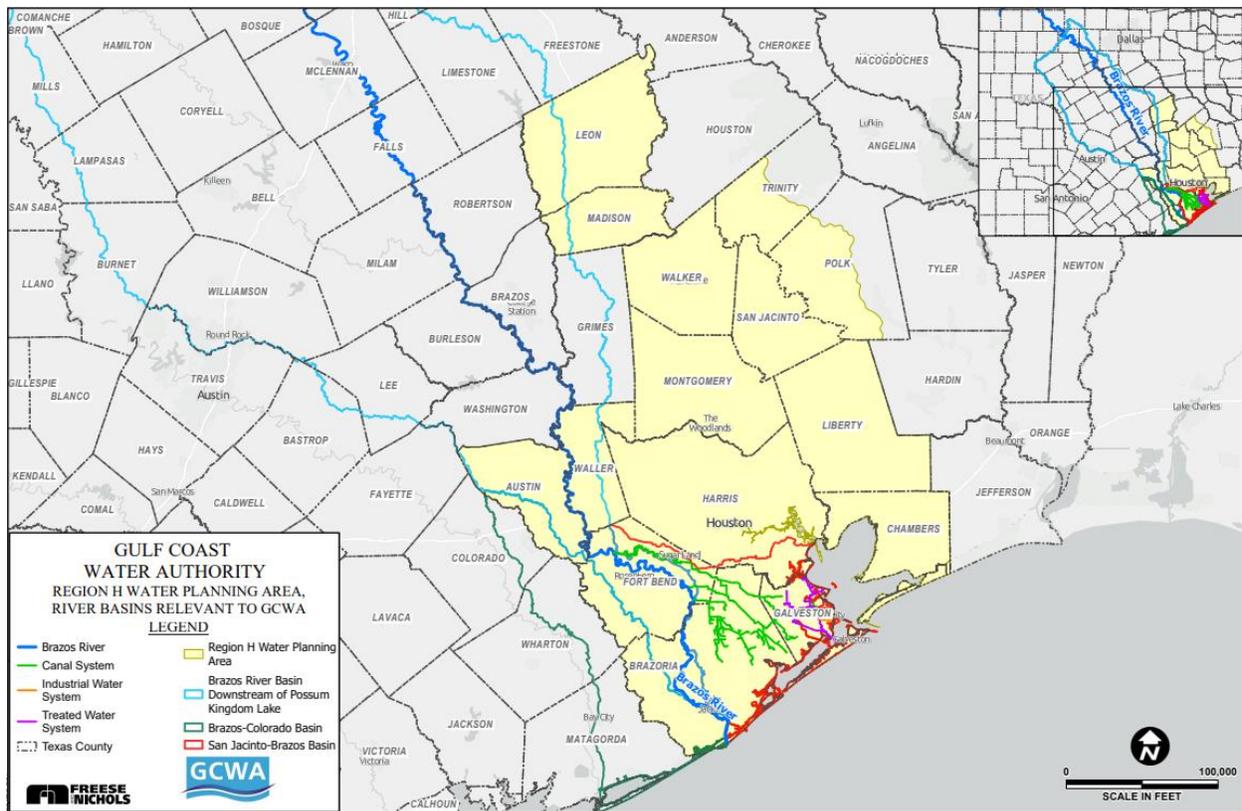


Figure 2 – Region H Water Planning Area and River Basins Relevant to GCWA Service Area

The Brazos River basin, which is historically impacted at times by both drought and flood, has suffered from increased stress in recent years due to climate shifts. A recent report completed for the Texas Water Development Board (TWDB) cited observed increases in both temperature and evaporation rates in the Brazos River basin, which could continue to lead to water scarcity risks (Freese and Nichols, 2021). Due to the nature of the local geography, imports of water from eastern basins that are less impacted by drought are challenging due to the development of the urban area of Houston.

Upstream of the GCWA diversion points, Brazos River water availability is also threatened by groundwater production from the Brazos Alluvium Aquifer. This groundwater formation, which has seen its use more than quadruple between 1980 and 2020, underlies the Brazos River and interacts closely with surface water. During low flows in the river, pumping from the aquifer provides further depletions from surface water, including both naturalized flows and firm water releases made in order to alleviate drought in the lower Brazos basin. Providing another source of water near the point of use and not subject to interception through groundwater pumping will further increase resiliency in the GCWA system.

The traditional alternative to surface water in the region has been groundwater from the Gulf Coast Aquifer. However, large, historical withdrawals of groundwater have led to significant land surface deformation due to subsidence, such that the GCWA service area in Galveston County was converted to surface water beginning in the 1970s.

Due to these challenges, the need for an alternative water supply that does not impact subsidence and is drought tolerant is of the utmost importance for GCWA to allow for a resilient water supply for the growing region. Desalination provides a drought-resistant alternative to existing water sources for the GCWA service area, which is regional in nature. That is, development of water near the coast can be immediately translated to GCWA customers upstream in the canal system. Outside of the GCWA system an additional supply from desalinated water may be able to provide additional surface water availability in the Brazos River basin through either the use of GCWA water rights or the freeing up of Brazos River Authority (BRA) contract supplies that can be used elsewhere. GCWA is in the unique leadership position to provide coordination with its customer base and other stakeholders, the BRA, Dow Chemical, and others to fully explore a potential project to be utilized in a regional manner to help alleviate water shortages in the lower Brazos River basin.

ii. *Projected water supplies and demands*

The 2021 Region H Water Plan presents a 50-year plan for the Greater Houston area, which include the GCWA service area. This high-level analysis evaluated water supply availability from GCWA’s water rights and contract supplies on a monthly basis and assigns the resulting supply to demands within the service area. The resulting supplies, demands, and needs for GCWA from this study are shown below in **Table 3**.

Table 3 – Projected Demands, Supplies, and Unmet Water Needs for GCWA from the 2021 Region H Regional Water Plan (Acre-Feet per Year)

		2020	2030	2040	2050	2060	2070
Water Demands	Industrial	104,353	113,347	113,794	113,948	114,133	114,356
	Municipal	126,678	135,318	135,578	138,981	142,110	148,556
	Total	231,031	248,665	249,372	252,929	256,243	262,912
Water Supplies		227,590	227,515	227,445	227,371	227,293	227,217
Projected Unmet Needs		(3,441)	(21,150)	(21,927)	(25,558)	(28,950)	(35,695)

In addition to this high-level analysis, GCWA has also conducted its own modeling of their water rights and operations. Where the Region H analysis uses a monthly timestep to estimate water availability and needs, the GCWA Daily-Hydro model evaluates water availability and reliability of GCWA’s Brazos River water rights on a daily basis considering observed hydrologic patterns and demands of other water right holders in the lower Brazos River basin (Intera Geosciences & Engineering, 2012). The results from this daily model can be compared to GCWA’s existing and projected demands to calculate the potential quantities of additional water that GCWA would need to obtain to supplement its Brazos River supplies and meet the demands of all its customers.

A recent version of the GCWA Daily-Hydro was simulated given current water supply options and management procedures utilized and available to GCWA, as well as GCWA’s current customer demands. Results from the model indicate that the GCWA would experience multiple annual shortages of water given a repeat of historic hydrology. The maximum annual shortage is

estimated to be approximately 83,613 acre feet, which occurred during an extremely dry year (Intera Geoscience & Engineering, 2015). Annual shortages typically occurred after GCWA has exhausted its existing water rights, stored water supplies, and contract water supplies from the BRA. This shortage represents current conditions (e.g., current supplies and demands) and does not factor in potential drought periods worse than the drought of record. Thus, there is potential that this shortage could be greater when considering either greater demands or supplies that are lower due to more extreme climate-change driven droughts. Already, the State of Texas Climatologist and others noted that reservoir inflow and storage in the Brazos River has generally decreased, eutrophication generally increased, and water temperature has generally increased. These trends appear to reflect a combination of local human influence, changes in local hydrology, and long-term climate trends (Nielsen-Gammon, 2020).

In summary, the 2021 Region H Water Plan and the GCWA Daily-Hydro model indicate that GCWA needs to develop alternative water supplies to reduce expected shortages in their system. The development of alternative water supplies that are not reliant on the Brazos River, their current sole source of water supply, would enable the GCWA to reduce their expected shortages as well as greatly increase the resiliency of their system during extremely dry periods.

iii. Potential desalinated water uses

The GCWA system provides a natural opportunity for regionalization without the development of extensive transmission infrastructure. Where many desalination concepts rely upon pipelines to connect potential users, GCWA's regional canal system allows for the development of an alternative water supply near the coast which, in turn, can free up existing Brazos River water for use by GCWA customers and others in the upper reaches of the system. Going a step further, a reduced demand on GCWA's water rights from the Brazos River can allow for the contracting of that water to other users along the river. Reduced or shifted demand may result in increased environmental flows. Increases in environmental flows would benefit environmental restoration efforts, coastal fish and wildlife that depend on those environmental flows, and recreational uses tied to coastal fish and wildlife such as recreational fishing.

GCWA is also a key customer of the BRA system and has access to over 80,000 acre-feet of water backed by BRA-operated reservoirs. By providing an alternative water source, GCWA can make these contract supplies available to other users of the BRA system which include customers downstream of Possum Kingdom Lake, located nearly 600 river miles upstream of the GCWA's Shannon Pump Station in the Brazos River basin (**Figure 3**).

Gulf Coast Water Authority
Regional Seawater Desalination Feasibility Study

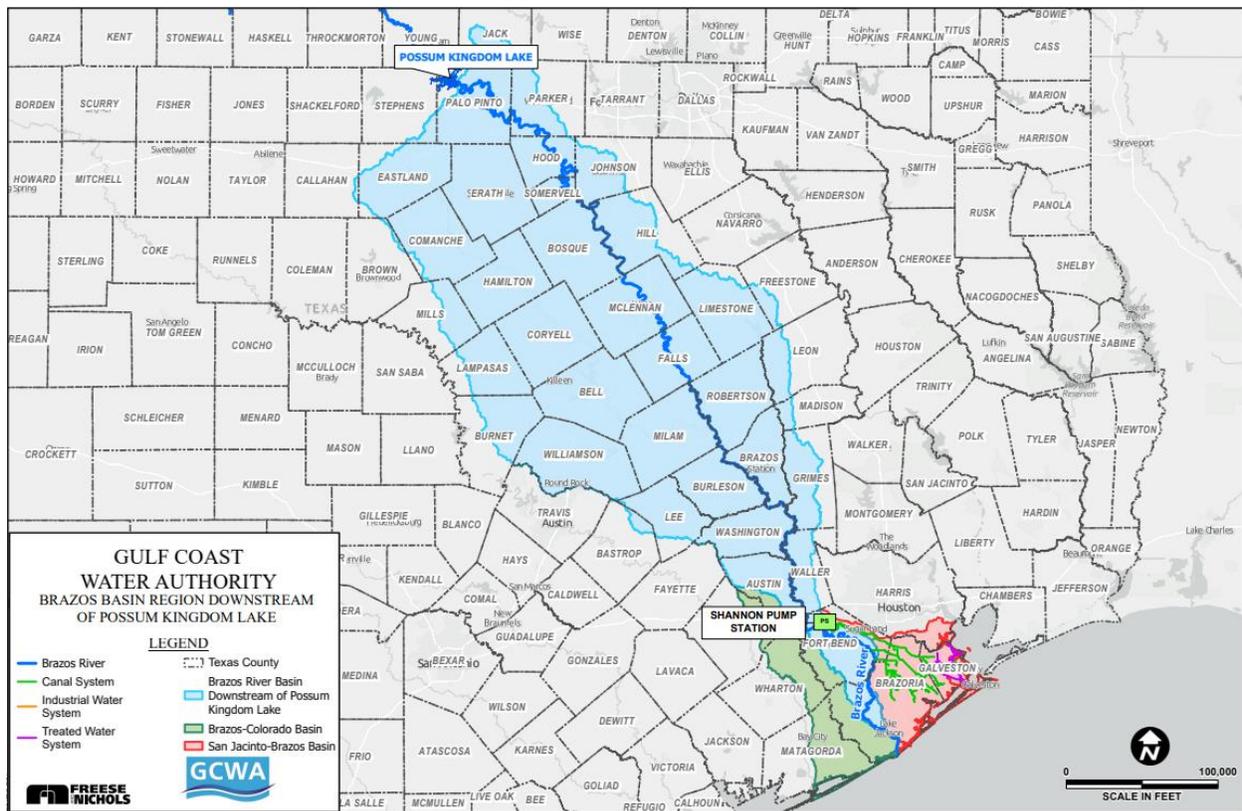


Figure 3 – Brazos Basin Region Downstream of Possum Kingdom Lake

This planning effort will model the GCWA system to project the impact that varying volumes of seawater desalination would have on the water supply portfolio. By accounting for the large-scale baseline drought-proof desalination supply at basin’s-end, the model will help determine the volumes of river water that can be stored upstream to help address projected water supply deficits within GCWA’s system and the region. Based on this modeling and analysis, a target seawater desalination volume and implementation phasing will be adopted.

iv. Proposed source water

In 2022, GCWA conducted a Seawater Desalination Business Case (Business Case) study that considered a seawater desalination production capacity of 40 million gallons per day (mgd) to be implemented in two 20 mgd phases. While 40 mgd is a good reference, determining the optimum capacity of seawater desalination that should be developed is one of the key issues to be examined and determined in this study.

The Business Case identified a wide range of potential sites with varying feed water qualities that may be considered for the GCWA seawater desalination project. The sites included locations with access to the open ocean off the coast of Galveston with salinity in the order of 30,000 mg/l and a generally stable water quality which would be conducive to a conventional seawater desalination treatment process. Other sites considered would draw water from Galveston Bay or Dickinson Bayou. These sites are influenced by seasonal freshwater discharges and exhibit moderate to large swings in seasonal salinity ranging from highly brackish (10,000 mg/l) to near

seawater (26,000 mg/l); if selected, these sites would require a variable salinity desalination treatment approach. A demonstration of the feasibility of variable salinity processes was conducted in 2013 through a collaborative effort between Reclamation, the Texas Water Development Board, and municipal entities in the Lower Rio Grande Valley (Bureau of Reclamation, Department of the Interior, 2014).

As part of the plant siting process, this study will compile historical data collected by the Texas Commission on Environmental Quality (TCEQ) Surface Water Quality Monitoring Program to assist in the initial characterization of feed water quality. Once a preferred site has been selected, a 12-month Source Water Characterization Plan will be designed and implemented to provide a more accurate source water profile and inform the future design of the desalination treatment and discharge process.

b. Subcriterion No.1b – Evaluation of Project Alternatives (15 Points)

i. Project alternatives

The GCWA is seeking to ensure a drought-proof water supply portfolio that contributes efficiently to the region’s drought resilience. As part of this study, GCWA will consider seawater desalination and other alternatives. These alternatives will be examined comparatively by considering their relative contribution to regional drought resilience, their potential economic viability, and potential long-term environmental sustainability. Hence, desirable alternatives would result in a substantive gain in regional resilience, are reasonable in cost and are environmentally sustainable.

ii. Investigation of project alternatives

Project alternatives will be developed primarily by reviewing planning reports generated by the regional water planning group (Region H) and the GCWA. Other alternatives might be identified through the stakeholder outreach process. A screening process to evaluate against the stated goals will be conducted to identify the most competitive option. The selected option(s) will be updated to draw an equitable comparison with the seawater desalination option.

The potential alternatives include: municipal and irrigation conservation; water loss reduction; transfer of water from East Texas; development of backup groundwater wells; wastewater reclamation for municipal or industrial use; increasing or restoring on- or off-channel storage; or water right contract amendments.

iii. Selected project

This project envisions a structural component, the implementation of a large-scale seawater desalination facility, and a non-structural component, identifying and evaluating the compounded impact of seawater desalination that could be accomplished through conjunctive water resource management.

As noted, the Desalination Business Case Study identified a conceptual 40 million gallon per day seawater desalination plant on Dickinson Bayou near Texas City. This proposed study will build on the initial Desal Business Case concept by modeling and examining water supply and demand projections and evaluating the impact that a large-scale seawater desalination supply would have

*Gulf Coast Water Authority
Regional Seawater Desalination Feasibility Study*

on the GCWA water supply portfolio. Stakeholder input would be sought regarding interest and willingness to participate in the project. This exercise will serve to determine the appropriate volume of seawater desalination that could be developed and the timing of its implementation.

Once the size of the project is determined, a siting process will be conducted to select a plant location, characterize the treatment process, and estimate the life-cycle cost of the project.

The end-of-basin replacement of river water use with desalinated seawater would allow for more river water storage in the existing reservoir and canal system. In times of drought, the stored water, along with the desalinated supply, would then be available to meet drought needs. This study will explore and incorporate in the cost analysis the cascading, upstream enhancement of water supply availability and environmental benefits that may be generated by the proposed shift in water resource management.

iv. Preliminary schedule

A preliminary schedule for the project is outlined in **Figure 4**.

Activity	Year 1				Year 2				Year 3				Year 4				Year 5				Year 6				Year 7				Year 8				Year 9				Year 10			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Feasibility Funding	█	█	█	█																																				
Project Definition and T XVI Feasibility Study					█	█	█	█																																
Project Financing (D-WINN and State)									█	█	█	█																												
Planning, Permitting, and Procurement													█	█	█	█	█	█	█	█																				
Design																					█	█	█	█	█	█	█	█												
Construction and Commissioning																																					█	█	█	█

Figure 4 - Preliminary Project Schedule

B. Evaluation Criterion 2 – Stretching Water Supplies (20 points)

i. Impact on development of non-desalinated water supplies

The GCWA service area has experienced challenges due to the historic use of groundwater in the area. The development of water sourced from saline water will further the responsible use of fresh water sources, such as groundwater and prevent the risks of subsidence and saltwater intrusion along coastal areas. The development of desalinated water also has the potential to delay or eliminate the need for large surface water projects that have significant impacts that require mitigation. Allens Creek Reservoir in the lower Brazos River basin is one such project that has been identified for use in meeting the region’s growing water demands. Other surface water development projects or interbasin transfers may also be delayed or avoided through the use of saline water obtained near the point of use. This benefit may be further extended through the regional nature of the GCWA system and the Brazos River basin, allowing for conserved surface water supplies near the coast to be used upstream for other customer needs.

ii. Impact on existing water supplies

GCWA owns three Certificates of Adjudication that grant rights to divert, store, and use water from the Brazos River basin. These three certificates provide the majority of water supply within GCWA’s canal system, including the American Canal, Briscoe Canal, and Juliff Canal. A pending water right amendment will allow the interchangeable use of these rights across these diversion points. GCWA’s existing water rights are summarized in **Table 4**.

The availability of water from these rights is highly dependent upon hydrologic conditions in the

Brazos River and operation by GCWA. Of the permitted diversions described, approximately 150,000 acre-feet per year were determined to be interruptible during the development of the 2021 Region H Regional Water Plan using a monthly timestep analysis. On a daily timestep, this interruptible portion can be estimated to be even higher. The addition of firm water supplies to compensate for short periods of low flow have the potential to increase overall firm supply in a ratio greater than 1:1 when operated conjunctively with these interruptible water supplies.

Table 4 – GCWA Brazos River Basin Water Rights

COA Number	Priority Date	Description	Permitted Diversion (Acre-feet per year)
5168	1926-01-15	Brazos River diversion	99,932
	1947-03-17	7,308 Acre-Feet storage	
	1999-04-29	65 Acre-Feet storage	
5171	1939-02-01	Brazos River diversion	75,000
	1950-12-12		50,000
5322	1929-02-08	Brazos River diversion	40,000
	1955-03-14	864 Acre-Feet storage for pumping	
	1983-07-25	Brazos River diversion	40,000
		Brazos River diversion	75,000
TOTAL			379,932

The availability of stored water from the BRA system also contributes to water supply yield and has the benefit of providing firm supplies during otherwise drought-impacted periods. In a similar way, desalinated water supplies can provide a firm water source to compensate for low flow conditions and increase overall yield. This complex interaction of hydrology and operations will be explored in greater detail in the feasibility study in order to estimate the overall system benefit to GCWA which, when used in conjunction with the interruptible portion of the GCWA water rights, may result in an overall yield benefit in excess of the desalination facility capacity. This opportunity has the added benefit of potentially making additional supply available for other GCWA customers, as well as other Brazos River basin water users.

iii. Project specific concerns

Water supply shortages

The Region H Water Plan identified industrial and municipal unmet water needs for the GCWA. These needs will grow from 3,441 acre-feet per year in 2020 to 35,695 acre-feet per year in 2070 (**Table 1**). As previously discussed, GCWA’s daily modeling which reflects historic hydrology and current demands points to multiple annual shortages during drought periods with a maximum projected annual shortage estimated to be approximately 83,613 acre-feet per year. Regional shortages in the Brazos, San Jacinto-Brazos, and Brazos-Colorado River basins – all of which intersect the GCWA’s service area and the area of potential supply impact – are projected to reach 228,305 acre-feet per year in 2070. Also, GCWA is often approached by industrial interests considering new investments that would result in new, potential water demands ranging from 11,200 to 22,500 acre feet per year. Given the confidential nature of inquiries and negotiations

related to business development, the actual potential customers and respective volumes cannot be disclosed within this application.

Water supply reliability

Ensuring long-term water supply reliability is a key GCWA concern. Water supply reliability is commonly increased by adding diversity of water sources to the water supply portfolio; greater diversity provides for greater reliability. GCWA's portfolio is dominated by surface water from the San Jacinto-Brazos Coastal and Lower Brazos River Basins. Surface water is increasingly threatened by changes in climate that exacerbate the potential for more severe and frequent droughts. As noted, groundwater from the Gulf Coast Aquifer which had been used as a back-up source to bridge surface water shortages is no longer available. Large-scale seawater desalination would be a substantive diversification element to the GCWA's system resulting in a more reliable water supply portfolio.

Groundwater depletion

Groundwater depletion is a wide-spread regional concern that has resulted in strict limits on groundwater withdrawals. GCWA's system is specifically impacted by groundwater withdrawals from the Brazos Alluvium Aquifer which cause depletions from surface water. Providing another source of water near the point of use and not subject to interception through groundwater pumping will further increase resiliency in the GCWA system.

Natural disasters

Climate scientists predict higher temperatures, drier conditions and extended droughts exceeding the severity of the regional planning drought of record (Nielsen-Gammon, 2020). Given GCWA's current reliance on surface water, the need to incorporate a drought insensitive new supply is of the utmost importance.

Alternative water supplies

Increasingly, water providers are considering alternative water supplies as viable options to address water deficits. Water reuse is an attractive means to extend the use of existing resources; and seawater desalination is a tool to capture an entirely new sources of water. Because of its location next to seawater sources and the regional nature of its water supply system, GCWA is concerned with ensuring a thorough evaluation of seawater desalination to make sure that it does not forego a valuable water supply opportunity.

iv. Drought flexibility impact

A seawater desalination facility would provide the GCWA with an additional firm water supply source that could greatly enhance the reliability and flexibility of their water supply during drought periods. This study will quantify and evaluate how desalinated seawater would increase the yield of the existing reservoir system. In times of drought, the additional stored water in the reservoir could be used in conjunction with the desalinated supply to meet needs during drought periods. Additionally, the conjunctive use between desalinated seawater and GCWA's existing water right would create flexibility in their system that could be optimized to generate additional supply available that could be delivered to other GCWA customers, as well as other water users

in the lower Brazos River basin region. As part of the proposed Feasibility Study, the extent to which the reliability of GCWA's water supply will improve and the additional flexibility gained by desalinated seawater will be evaluated in greater detail.

Other alternative water supply options, such as obtaining water supply through contracts with the Brazos River Authority or on- or off-channel storage along the Brazos River, will be limited by the reliable supply available from the Brazos River during drought conditions. Water conservation and water loss reduction alternatives are not firm water supplies available to the GCWA during times of drought. Additionally, groundwater alternatives are severely limited due to the lack of availability, potential for subsidence, and the environmental challenges associated with the Brazos River alluvium.

C. Evaluation Criterion 3 – Environment and Water Quality (20 points)

i. Potential to improve water quality

The most critical issue concerning groundwater in the study area is the subsidence effect of groundwater pumping. The addition of seawater desalination will have the potential effect of reducing groundwater pumping and mitigating the subsidence potential. Reductions in groundwater extractions will have the incidental benefit of limiting groundwater quality deterioration due to saltwater intrusion.

Once a plant site is selected, GCWA will initiate a Source Water Characterization program that would allow for a comprehensive profiling of the source water and identification and quantification of pollutants present in it. Reverse osmosis processes are recognized for their pollutant removal capabilities. It is anticipated that the desalinated product water and its eventual contribution to wastewater effluent discharges would provide for measurable improvements to surface water quality.

ii. Potential to improve effluent quality

The seawater desalination treatment process removes suspended solids and most pollutants from the feed water. These removed materials are captured in sludge that is dewatered and hauled to landfills. Dissolved minerals are captured in the reverse osmosis process and the resulting concentrate is returned to the body of water. Water characterization studies are undertaken to adjust the desalination treatment and the concentrate disposal processes to ensure that safe and environmentally sustainable practices are employed. An incidental benefit of seawater desalination is the removal of pollutants such as Zinc and Copper in the concentrate stream returned to the source of feed water.

The siting process will consider the technical and environmental feasibility of concentrate disposal as one of the site selection factors. Once a site is selected and the project is scheduled for implementation, a National Pollutant Discharge Elimination System (NPDES) permit will be required. The permitting process requires characterization of the receiving waters and of the toxicity limits of marine life that could potentially be impacted by the concentrate discharge. Different disposal strategies are considered to ensure that the disposal is conducted in accordance with the limits set in the respective permit. An example of the potential for exceeding State and Federal discharge requirements is when an open discharge would be regulatorily acceptable, but a diffuser array is selected instead to ensure a more environmentally sustainable

strategy is adopted.

iii. Potential to improve a natural stream

GCWA's regional canal system allows for the development of an alternative water supply near the coast which, in turn, can free up existing Brazos River water. Going a step farther, a reduced demand on GCWA's water rights from the Brazos River may result in increased environmental flows. Increases in environmental flows would benefit the Brazos River and potentially some of its tributaries. The flora and fauna, and the ecological dynamics dependent upon reliable flows within the Brazos River system may benefit from an alternative water source. This planning effort will examine the potential changes in stream flows resulting from implementation of the seawater desalination project.

iv. Potential habitat restoration

If seawater desalination results in a reduced demand on GCWA's water rights from the Brazos River, then increases in environmental flows would benefit fish and wildlife, and their habitats, that dependent upon reliable flows.

Reduction of demand in groundwater will help reduce subsidence and subsequent loss of coastal intertidal marsh. This marsh provides habitat for juveniles of many ecologically, commercially, and recreationally important species of fish, shellfish, and wildlife. If project infrastructure is located within the bay, then mitigation could be required as part of environmental regulatory compliance requirements. This would offer another opportunity to enhance or restore habitat. Similarly, if project infrastructure is located within the bay and infrastructure requires riprap and other protective components, then this may offer additional opportunities to provide substrates that function as habitat (such as living shoreline breakwaters with oyster and other bivalve colonization).

v. Potential to provide water for endangered/threatened species habitat

If seawater desalination results in a reduced demand on GCWA's water rights from the Brazos River, then increases in environmental flows could benefit several federally listed species such as the Texas Fawnsfoot (*Truncilla macrodon*), Eastern Black Rail (*Laterallus jamaicensis spp. jamaicensis*), Red Knot (*Calidris canutus rufa*), or Piping Plover (*Charadrius melodus*). Texas Fawnsfoot is a freshwater mussel that would directly benefit from increased environmental flows within the Brazos River system. Eastern Black Rail habitat includes estuarine wetlands that are highly dependent upon reliable hydrology. Reduction of subsidence will help protect intertidal and high marsh used by Eastern Black Rail for foraging and nesting. The Red Knot and Piping Plovers occupy similar intertidal habitats that rely on both tidal and riverine dynamics. Reduction of subsidence will help reduce the conversion of intertidal sand bars and beaches in the bay used by foraging Red Knots and Piping Plovers to open water.

D. Evaluation Criterion 4 – Department of the Interior Priorities (15 points)

i. Climate Change

Regional water planning in Texas does not consider potential declines in water supply related to future climate change. However, Texas is recognized as a water stressed state and vulnerable to changes in water availability resulting from global climate change. The effects of climate change,

combined with human influence and changes in local hydrology are evidenced in the general decrease of reservoir inflow and storage in the Brazos River basin. A 2020 article by John Nielsen-Gammon, Texas State Climatologist and director of the Texas Center for Climate Studies, reports that most climate models and indicators show significant shifts in Texas toward drier conditions during the latter half of the 21st century than even the most arid centuries that were characterized by megadroughts (Nielsen-Gammon, 2020).

By developing a large-scale seawater desalination supply, a water management strategy that is relatively insensitive to climate change, the GCWA provides valuable flexibility to the management of its surface water storage and conveyance system. The addition of a substantial drought-proof supply at the end of the basin, allows for increased storage of excess flows in the upper reaches of the basin, creating a supply that to be tapped in drier times.

The proposed project adds the ability to satisfy water needs under a broad range of supply and demand conditions, including those driven by changes in population and climate. As noted, the conjunctive management of desalinated water and river water resources made possible by the seawater desalination project would increase the system's resilience to drought. More water could be stored in the upper reaches of the system and made available in drier times. Additionally, an important segment of the GCWA customer base would directly benefit from the added reliability of a drought-proof potable water production to meet their needs.

ii. Disadvantaged or Underserved Communities

GCWA currently provides water supply to industrial, municipal, and agricultural customers in Brazoria, Fort Bend, and Galveston counties in Texas through its sole source of water from the Brazos River. A large demographic of these customers represents either disadvantaged and/or historically underserved communities. A potential seawater desalination project would provide GCWA with the ability to deliver a more resilient and reliable water supply to these communities, especially during extreme drought conditions. Additionally, with the potential enhancement of their water supply portfolio through a seawater desalination project, the GCWA will have the opportunity to supply incoming industries in the Texas Gulf Coast area, which could provide economic growth opportunities across the region.

The diverse communities that GCWA serves are historically disadvantaged and socially vulnerable based on a number of variables. According to American Community Survey (ACS) 5-year data (2016-2020), over 200,000 people in the three counties that GCWA currently serves are below 150 percent of the federal poverty level, over 40,000 people are unemployed, nearly 100,000 do not have a high school diploma, and over 110,000 occupied housing units have an annual income less than \$75,000 with more than 30 percent or more of their income going toward housing costs (U.S. Census Bureau, 2020). Nearly 190,000 people in these counties do not have health insurance and over 130,000 were identified to have a disability. Approximately 880,000 people in these three counties are minorities (Hispanic or Latino of any race; Black and African American; American Indian and Alaska Native; Asian; Native Hawaiian and Other Pacific Islander; Two or More Races; Other Races), which represents nearly 60 percent of the total population.

*Gulf Coast Water Authority
Regional Seawater Desalination Feasibility Study*

Approximately 575,000 people in these counties are either Age 65 and older or Age 17 and younger, totaling nearly 40 percent of the total population. Additionally, there are nearly 60,000 people in these counties that speak English “less than well”. There are also over 15,000 households reported to not having a vehicle available.

The Centers for Disease Control and Prevention and Agency for Toxic Substances and Disease Registry (CDC ATSDR) develops the Social Vulnerability Index (SVI) to help public health officials and emergency response planners identify communities that are most likely to need support during, during, and after hazardous events. SVI measures the relative vulnerability of every U.S. Census tract by ranking 16 social factors, including socioeconomic status (below 150% poverty, unemployment, no health insurance), household characteristics (Ages 65 and older or 17 and younger, civilians with disabilities, English language proficiency), racial and ethnic minority status, and housing type and transportation (mobile home, no vehicle) (Centers for Disease Control and Prevention-Agency for Toxic Substances and Disease Registry, 2020).

According to the most recently published 2020 SVI database for the US, there are 59 Census tracts in Brazoria, Fort Bend, and Galveston counties that have a “medium-high” level of vulnerability and 75 Census tracts that have a “high” level of vulnerability (**Figure 5**). The population within the Census tracts identified to have a level of vulnerability of either “medium-high” or “high” represents nearly 600,000 people, indicating that a significant population located within the current GCWA service area is socially vulnerable.

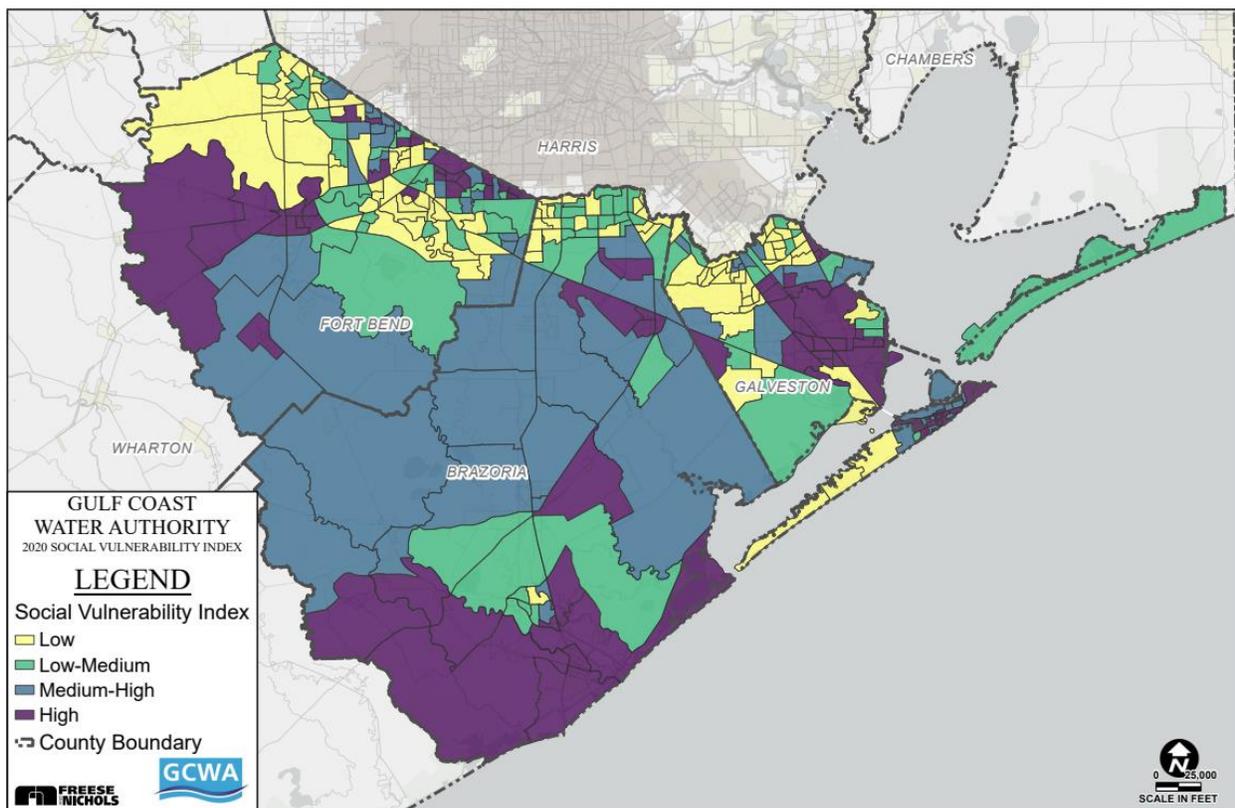


Figure 5 – 2020 CDC Social Vulnerability Index (SVI) by Census Tract in GCWA Service Area Counties

iii. Tribal Benefits

There are no Indian Tribes located within the study area.

E. Evaluation Criterion 5 – Watershed Perspective and Stakeholder Involvement (15 Points)

i. Regional/state water plan

The Region H Water Planning Group’s interest in seawater desalination goes back several decades. In the early 2000’s, the GCWA and the Brazos River Authority (BRA) offered competing proposal for consideration in a state-sponsored large-scale seawater desalination initiative. Although the state selected the BRA project for further consideration, the GCWA proposal to co-locate a seawater desalination plant with a power generation facility was a very close competitor and has remained an alternative under consideration by the GCWA. Seawater desalination is an option under consideration in GCWA’s current integrated water resource management planning.

Region H has considered seawater desalination in all of its various plan iterations and most plans have included it as either a recommended or an alternative water management strategy. The current regional water plan includes a recommendation to develop 11,200 acre-feet per year of seawater desalination supplies by year 2040.

ii. Regional scope

The proposed project will meet the needs of GCWA’s current customers and expand the yield of its surface water supply portfolio to benefit other potential customers upstream in the basin.

The GCWA system provides a natural opportunity for regionalization without the development of extensive transmission infrastructure. GCWA’s regional canal system allows for the development of an alternative water supply near the coast which, in turn, can free up existing Brazos River water for use by GCWA customers and others in the upper reaches of the system. Going a step farther, a reduced demand on GCWA’s water rights from the Brazos River can allow for the contracting of that water to other users along the river.

iii. Partnerships

GCWA is itself a partnership governed by representatives appointed by Galveston, Brazoria and Fort Bend counties and includes municipal governments, industry, agriculture and community members at large. In addition to those currently represented in GCWA’s governance, the Authority has reached out to various regional stakeholders to seek their participation and support for the present study and, eventually, their partnership in the implementation of the seawater desalination project.

GCWA’s general manager is a member of the Region H Water Planning Group. Planning groups in Texas are composed of representatives of all water interests in any given region. The membership of the planning group updates the regional water plan every five years. The most recent edition of the Region H Water Plan was published in 2021. The development of the next Plan by the Region H Water Planning Group is ongoing and is set to be published in 2026.

*Gulf Coast Water Authority
Regional Seawater Desalination Feasibility Study*

iv. Public outreach

The GCWA is a participating member of the Region H Water Planning Group which provides for continued stakeholder involvement in the analysis of water supply issues in Region H.

Public outreach is a key component of the scope of work for the present feasibility study. GCWA proposes to convene a stakeholders group to help collect and disseminate information relevant to the project seawater desalination project. This process has already begun by soliciting statements of support and potential partnership from key stakeholders in the region, including the Brazos River Authority (BRA) and Harris Galveston Subsidence District (HGSD).

F. Evaluation criteria compliance summary

Eval. Criterion	Summary response
No. 1a Water desalination needs and opportunities	<p>Need: Region H projects a drought-of-record based need of 36,000 AFY for year 2070 for GCWA’s service area. GCWA’s system modelling predicts annual shortages exceeding 83,000 AFY in extremely dry years. Projected needs in the served basins but outside GCWA’s basin are projected to reach 228,305 AFY in 2070.</p> <p>Opportunity: GCWA coastal location provides access to multiple potential sites for seawater desalination and its vast raw water canal network, storage reservoirs and potable water distribution system provides a valuable opportunity to leverage and enhance the benefits of desalination through conjunctive management with existing surface water throughout the basins located within GCWA’s service area and beyond.</p>
No. 1b Evaluation of project alternatives	<p>The study will inventory water planning studies and consult with key stakeholder to identify viable alternatives. Cost of alternatives selected for comparison will be updated for an equitable comparison with seawater desalination based on stated objectives.</p>
No. 2 Stretching water supplies	<p>There are two supply components that would be enabled by the seawater desalination project: direct desalinated product water for GCWA’s potable water customers; and, freed-up water to enhance upstream raw water storage and expanded customer use.</p>
No. 3 Environment and water quality	<p>The addition of seawater desalination will have the potential effect of reducing groundwater pumping and mitigating the subsidence potential. Reductions in groundwater extractions will have the incidental benefit of limiting groundwater quality deterioration due to saltwater intrusion and will help reduce subsidence and subsequent loss of coastal intertidal marsh. This marsh provides habitat for juveniles of many ecologically, commercially, and recreationally important species of fish, shellfish, and wildlife.</p> <p>Potential increases in environmental flows would benefit the Brazos River and potentially some of its tributaries. The flora and fauna, and the ecological dynamics dependent upon reliable flows within the Brazos River system include multiple federally listed species. Texas Fawnsfoot is a freshwater mussel that would directly benefit from increased environmental flows within the Brazos River system. Project infrastructure may be located within the bay and would require riprap and other protective components that may offer additional opportunities to provide substrates that function as habitat (such as living shoreline breakwaters with oyster and other bivalve colonization)</p> <p>An example of an opportunity to exceed State and Federal effluent discharge requirements is when an open discharge would be regulatorily acceptable, but a diffuser array is selected instead to ensure a more environmentally sustainable strategy is adopted.</p>

Gulf Coast Water Authority
 Regional Seawater Desalination Feasibility Study

Eval. Criterion	Summary response
No. 4 Department of interior priorities	<p>The effects of climate change, combined with human influence and changes in local hydrology are evidenced in the general decrease of reservoir inflow and storage in the Brazos River basin. This project would provide a substantive new supply of water that is relatively non-sensitive to climate change and one which provides the ability to benefit users in the upper reaches of the river basin.</p> <p>This new supply would be a significant diversification of the water supply portfolio which translates into an increased resiliency to drought-related reduction of river flows and reservoir storage.</p> <p>The communities that GCWA currently serves are historically disadvantaged and socially vulnerable and more susceptible to external stresses, such as natural disasters, including droughts.</p>
No. 5 Watershed perspective	<p>Seawater desalination has been included as recommended or an alternative water management strategy in all editions of the Region H Water Plan. The current plan, published in 2021, includes a recommendation to develop 11,200 acre-feet per year of seawater desalination supplies by year 2040.</p> <p>The goal for the seawater desalination project is to help meet the needs of GCWA's current customer base and expand the yield its surface water supply portfolio to benefit other potential customers located upstream in the basin.</p> <p>GCWA is actively seeking support and partners for the seawater desalination project. Public outreach is a foundational task in the proposed study.</p>

III. Project budget

A. Funding plan

GCWA will provide the 100 percent match of the non-Federal costs to finance the project.

B. Budget proposal

Table 5 summarizes non-federal and requested federal funding sources.

Table 5 - Summary of Non-Federal and Federal funding sources

Funding Sources	Amount
Non-Federal Entities	
Gulf Coast Water Authority	\$365,500
Non-Federal subtotal	\$365,500
REQUESTED US Bureau of Reclamation funding	\$365,500
Total Project Cost	\$731,000

Table 6 includes information on costs that will be covered using the funding requested from Reclamation, costs that can be contributed as a non-Federal cost share by the applicant, and third-party in-kind contributions.

Table 6 - Total project cost

Source	Amount
Costs to be reimbursed with the requested Federal funding	\$365,500
Costs to be paid by applicant	\$365,500
Value of third-party contributions	\$0
Total project cost	\$731,000

C. Budget narrative

GCWA will procure a consulting team to execute all tasks described in the Regional Seawater Desalination Feasibility Study scope of work. The Regional Seawater Desalination Feasibility Study scope of work is included as a separate attachment in the grant application. Additionally, the GCWA is planning to procure a consultant to support them with performing grant management and administration tasks to ensure that they maintain compliance with federal grant funding terms and requirements. A standalone scope of work was developed for this effort and is included as a separate attachment in the grant application. The cost for both the Regional Desalination Feasibility Study scope of work and grant compliance and administration scope of work are included in the total project cost.

The contracted amount will be limited to the total project cost noted in **Table 6**. The Budget Narrative Attachment Form was summarized using the Budget Detail and Narrative spreadsheet.

D. Letters of funding commitment (if applicable)

Letters of funding commitment are not applicable to this project.

IV. Required permits or approvals (recommended)

There are no permits required for the implementation of the proposed planning and feasibility study.

V. Official resolution (recommended; will not count toward the page limit)

An official resolution for this project is included as a separate attachment in the grant application.

VI. Letters of support for the project and letters of participation (recommended, will not count toward the page limit)

Letters of support for the project have been provided by the Brazos River Authority and Harris Galveston Subsidence District. These letters of support are included as a separate attachment in the grant application.

VII. Overlap or duplication of effort statement (recommended)

GCWA is only seeking financial assistance for the seawater desalination planning and feasibility study under the present funding opportunity. If this funding is secured and the seawater desalination project is determined to be feasible, then GCWA anticipates seeking federal assistance for planning, design and construction under Water Infrastructure Improvements for the Nation (WIIN) Act. GCWA anticipates applying for state financial assistance to finance the corresponding match under the WIIN program.

VIII. Uniform audit reporting statement (recommended)

The most recent Single Audit report for the Gulf Coast Water Authority, for the Fiscal Year ended August 31, 2022, is included as a separate attachment in the grant application.

IX. Conflict of interest disclosure statement (recommended)

Pertaining to 2 CFR §1402.112, GCWA attests that it is not aware of any conflicts of interest. Furthermore, if awarded financial assistance under the present application, GCWA will examine its internal controls to ensure that, at a minimum, these procedures identify, disclose, and mitigate or eliminate identified conflicts of interest. GCWA will notify the Financial Assistance Officer in writing of any conflicts of interest that may arise during the life of the award, including those that have been reported by subrecipients.

X. References

- Bureau of Reclamation, Department of the Interior. (2014). *Variable Salinity Desalination*. Denver: Bureau of Reclamation.
- Centers for Disease Control and Prevention-Agency for Toxic Substances and Disease Registry. (2020). *CDC/ATSDR Social Vulnerability Index 2020*.
- Freese and Nichols. (2021). *Assessment of How Trends in the Brazos River Basin May Affect Surface Water Availability and Attainment of Environmental Flow Standards*. Austin, Texas: Texas Water Development Board.
- Intra Geoscience & Engineering. (2015). *Gulf Coast Water Authority Water Reliability Assessment For Long-Term Planning*.
- Intra Geosciences & Engineering. (2012). *Daily Water Rights Accounting in the Lower Brazos River Basin*.
- Nielsen-Gammon, J. W. (2020). Unprecedented drought challenges for Water Resources in a Changing Climate: What Do Researchers and Stakeholders Need to Know? *Earth's Future*.
- Region H Water Planning Group. (2021). *2021 Region H Water Plan*. Austin, Texas: Texas Water Development Board.
- U.S. Census Bureau. (2020). Retrieved from 2016-2020 American Community Survey 5-Year Data, By County: <https://data.census.gov/table>

THIS PAGE INTENTIONALLY LEFT BLANK

Official Resolution



Gulf Coast Water Authority

Title XVI Compliant Seawater Desalination Feasibility Study

GCWA Board Resolution

Applicant:

Gulf Coast Water Authority
Brandon Wade, General Manager
4243 Emmett F. Lowry Expressway
Texas City, TX 77591
Email: bwade@gcwatx.gov
Phone: 409-935-2438

Project Manager:

Samantha Stoughtenger Branson, Project Manager
4243 Emmett F. Lowry Expressway
Texas City, TX 77591
Email: [sstoughtenger@gcwatx.gov](mailto:ssoughtenger@gcwatx.gov)
Phone: 409-739-9581

Gulf Coast Water Authority Resolution 2023-6

APPLICANT RESOLUTION

Resolved that the governing officials for the Gulf Coast Water Authority have:

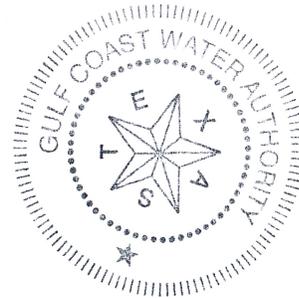
- Reviewed the full funding announcement terms and support the application submitted under the US Bureau of Reclamation (USBR) WaterSMART: Water Recycling and Desalination Planning Grants Program for FY 2023 (Notice of Funding Opportunity (NOFO) No. R23AS00076),
- The capability to provide the amount of funding and/or in-kind contributions specified in the Funding Group I (minimum 50% cost share, with grant funding not to exceed \$1,000,000 total over two years), and
- Will work with the USBR to meet established deadlines for entering into a grant or cooperative agreement.

We certify that the above constitutes a true and correct copy of the resolution approved by the governing officials of the Gulf Coast Water Authority.

Brad Matlock, PE



President
Gulf Coast Water Authority Board of Directors





February 23, 2023

Bureau of Reclamation
Financial Assistance Operations Section – NOFO Team
PO Box 25007, MS 84-27133
Denver, CO 80225

SUBJECT: WaterSMART: Water Recycling and Desalination Planning (NOFO: R23AS00076)
Letter of Support for the Gulf Coast Water Authority

To whom it may concern:

I serve as the General Manager for the Harris-Galveston Subsidence District (HGSD). I am writing to express support on behalf of the HGSD for the WaterSMART planning grant application submitted by the Gulf Coast Water Authority (GCWA) for the development of a seawater desalination feasibility study. The GCWA project aligns with the HGSD mission and has great potential to benefit the entire region.

HGSD is the premier water management and subsidence authority for the Upper Gulf Coast Aquifer in Texas. Additionally, we play an integral role in regional water planning and the development of management strategies. Our mission supports the long-term viability of all water resources while protecting lives and property within the HGSD boundary from the dangers of land subsidence. A significant portion of the GCWA service region is within the HGSD regulatory boundary, including vulnerable industrial coastal areas with considerable subsidence rates.

To prevent future land subsidence in our area, groundwater use must be reduced and replaced with alternative supplies. Because alternative water supplies have been limited by stiff competition and are susceptible to drought, the coordination of existing and development of new water resources is paramount. Investment in solutions currently posed by GCWA is vital in securing adequate water resource availability for our region today and in the future.

HGSD supports GCWA in its investigation of a seawater desalination facility. We believe this project would stretch the already limited regional water supplies and benefit the Houston region and other upstream water users in Texas.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael J. Turco".

Michael J. Turco
General Manager





Brazos River Authority



QUALITY • CONSERVATION • SERVICE

February 24, 2023

Bureau of Reclamation
Financial Assistance Operations Section – NOFO Team
PO Box 25007, MS 84-27133
Denver, CO 80225

SUBJECT: WaterSMART: Water Recycling and Desalination Planning (NOFO: R23AS00076)
Letter of Support for the Gulf Coast Water Authority

To whom it may concern:

Serving as the General Manager/CEO for the Brazos River Authority (BRA), I am writing to express our support of the WaterSMART planning grant application submitted by the Gulf Coast Water Authority (GCWA) for the development of a feasibility study for seawater desalination. The BRA and GCWA have had nearly a century's long partnership in providing surface water supplies to the lower Brazos River basin in southeast Texas.

The GCWA service area (which includes Fort Bend, Brazoria, and Galveston counties) is one of the leading economic generators for the US and an agricultural stronghold for Texas. Drought conditions and competition for essential water resources are a threat to those economies and our way of life. As such, we are very excited to hear GCWA is actively seeking opportunities to develop new water resources within our region.

The drought conditions of 2022 hit the BRA system hard and further re-enforced the need to look for water supply diversification options. Development of a desalination plant in the lower basin could provide crucial water supply resources that would stretch regional water supplies and bolster system resiliency. This project could ultimately benefit more than a million customers regionwide.

BRA fully endorses GCWA in pursuing seawater desalination. We believe the technology could provide drought contingency and system resiliency on a regional scale. We anticipate the planning study will provide a roadmap for development and funding of the regional solution. We look forward to servicing as a key stakeholder on the project.

Sincerely,

David Collinsworth
General Manager/CEO, Brazos River Authority