



**2024 Request for Proposals  
Texas Produced Water Consortium**

**Analytical Support for Desalination of Texas Oilfield Waste  
Produced Water**

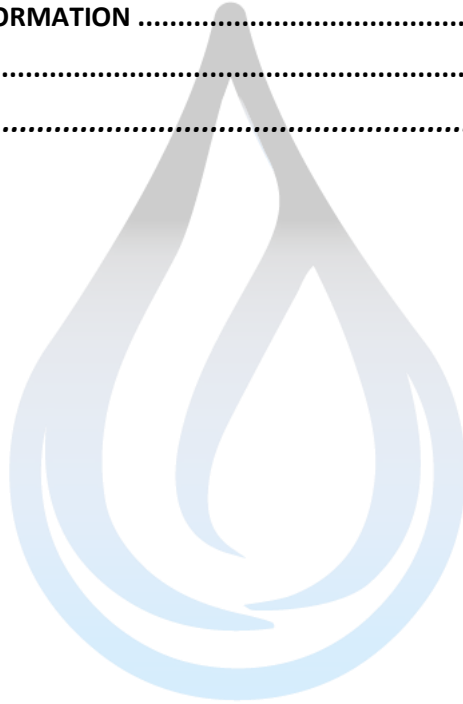
**Closing Date: February 2, 2024**

This Request for Proposal (RFP) pertains to the intended provision of analytical support by Texas Produced Water Consortium to support assessment of treatment capabilities and associated costs of technologies for potential social beneficial use oilfield waste produced water. Proposed projects are envisioned to attain product water of quality sufficient for “fit for purpose”. The proposed pilot projects shall not result in any discharges to land, surface water bodies, or groundwater unless the respective water quality is supported by permit approval via the appropriate regulatory agency; e.g. Railroad Commission of Texas (RRC) and/or Texas Commission on Environmental Quality (TCEQ).

# Table of Contents

## Table of Contents

<b>SCHEDULE .....</b>	<b>3</b>
<b>TEXAS PRODUCED WATER &amp; PROGRAM DRIVERS.....</b>	<b>3</b>
<b>PROGRAM AND RFP OVERVIEW.....</b>	<b>4</b>
<b>ELIGIBILITY .....</b>	<b>4</b>
<b>AWARD PROCESSING AND INFORMATION .....</b>	<b>6</b>
<b>PROPOSAL CONTENT .....</b>	<b>6</b>
<b>FINAL TECHNICAL COMPLETION REPORT .....</b>	<b>7</b>
<b>PROPOSAL SUBMISSION INFORMATION .....</b>	<b>8</b>
<b>CONTACT INFORMATION.....</b>	<b>8</b>
<b><i>APPENDIX A</i> .....</b>	<b><i>9</i></b>



## SCHEDULE

January 12, 2024	RFP release
January 18, 2024	Q&A session
February 2, 2024	Proposals due
February 9, 2024	RFP reviews due
February 9-16, 2024	Proposal Rankings
February 19-23, 2024	Project Selection/Recipient Notification
March 18, 2024	Project target start date ( <b><u>PLEASE NOTE: If you have a project that you believe is qualified but will not be operational by March 18, you are still encouraged to submit as TXPWC will be making revolving timeline selections as funding allows.</u></b> )

## TEXAS PRODUCED WATER & PROGRAM DRIVERS

The importance of water availability to support critical societal and economic needs in growing population areas of Texas, which are also facing devastation as a result of drought on an increasingly frequent basis, cannot be overstated. It is the combination of such prolonged drought, population growth, and resulting reduced aquifer replenishment that has raised concerns of legislators, regulators, and the general public looking to address Texas water needs. All viable options to address the declining and increasingly constrained volume of available water sources are on the table warranting consideration.

Texas is fortunate to possess the strongest base of oil production in the United States. This industry has served not only as an economic engine for the state and nation but has also supported, and continues to support, innovative research into numerous fields. One such area of research, which includes the purview of this Consortium, is water conservation, reuse, and recycling.

Numerous major oil producing basins span the entire state, which also generate water (“produced water”) predominantly disposed of via subsurface well injection. Although currently designated as a waste, produced water has enormous potential to support Texas’ growing social and economic water needs as evidenced in the *2022 Texas Produced Water Consortium Report to the Texas Legislature*, as well as several functioning operations across the US. It is estimated that approximately 10-14,000,000 barrels of produced water are generated every day in the Permian Basin of Texas alone; currently these volumes are managed through a combination of industry reuse or injected back in the earth into deeper formations, leading to seismicity and formation pressure concerns.

Produced waters are ancient underground seawaters where oil was formed tens of millions of years ago, typically associated with a high (and varying) salinity range as a result. For example, in the Permian Basin, average salinity is estimated at 120-130,000 ppm TDS. Utilizing current technology, it is estimated that up to 50% of treated water could be captured for reuse outside of the industry, although that capture rate may be increased or

decreased depending on the salinity of the influent stream. As mentioned previously, there is anecdotal evidence to support the viability of beneficial reuse of treated produced water in other states, but pilot projects are necessary to determine the feasibility of this beneficial reuse opportunity as it relates specifically to the Permian Basin of Texas. Provided this water could be proven to be safe and economical for fit-for-purpose uses, other potential benefits would include enhancement of biodiversity and revitalization of ecosystems in arid locations, carbon dioxide uptake, and the potential for reduction of seismicity and formation pressures. Oil & Gas is truly one of the few industries capable of attaining “Net Positive” water, rendering an opportunity worth pursuing for our state, our nation, and the entire globe.

Produced Water Consortia, multiple Universities and industry partners and stakeholders have been actively expending resources to advance water treatment technologies from concept stage to commercialization. Looking to existing successful treatment operations in the US along with recent developments in distillation efficiency and other technological advancements in the field of water treatment, the Texas Produced Water Consortium truly believes that techno-economic options of commercial viability may be at hand. This pilot project program is designed to provide further evidence to that end.

## PROGRAM AND RFP OVERVIEW

In 2021, Texas Senate Bill 601 went into effect enabling formation of the Texas Produced Water Consortium. The consortium is created to bring together information resources to study the economics of and technology related to, and the environmental and public health considerations for beneficial uses of fluid oil and gas waste. In 2023, the Texas Legislature approved additional funding for the Consortium to conduct pilot projects regarding treated produced water analysis, land/crop application and associated research/analysis, and bench scale testing/support for innovative technologies not yet ready for field deployment.

Specific to this RFP and consistent with its responsibilities, the Consortium shall determine the feasibility of proposals for research or investigation by the Consortium and decide which proposals to accept for research or investigation. The Consortium is proposing to provide complete funding for a full suite of predetermined analytical testing over the determined period for selected pilot projects.

## ELIGIBILITY

To that end and per direction of leadership with the consent and participation of Consortium membership, proposals seeking analytical support of proposed techno-economic efficient desalination processes are being requested with the understanding that each respondent seeking such analytical support will, at minimum, be responsible for and/or ensure the following:

- Proposed desalination technology must be able to yield waters of less than 1,000 mg/l TDS
- Preference will be given to systems capable of processing 200+ barrels per day of produced water feed, with a treated and “quality” water recovery stream targeting 50% or more.
- Expected system Operational Performance Summary (See excel spreadsheet)
- Bonding and insurance information.
- Percentage recovery of “quality” water proposed for consideration as “fit for purpose,” along with proposed social use, quantification, and characterization of the waste stream(s)
- Bear all costs related to construction, mobilization and demobilization of proposed treatment equipment.
- Provide all necessary resources needed to operate the technology, including but not limited to energy, personnel, disposal of any and all streams of produced water that are not utilized for analytical assessment, among others.
- Establishment, access, and use of site(s) necessary to support and conduct the pilot test. Respondents without an existing site may still be eligible dependent upon cooperative ability to find willing partnerships for site hosting.
- Ensure all process streams associated with the proposed pilot technology system and testing are closed loop, with exceptions allowed for projects having attained or planning to attain approval by either the RRC or TCEQ for beneficial use testing within the first month of pilot project operation.
- If proposed projects are also jointly sanctioned by the RRC or TCEQ, TXPWC requires the sharing of all information consistent with the respective commission protocol.
- Sharing of information pertaining to operating parameters (e.g. temperatures and pressures), Safety Data Sheets (SDS), and any known operational consideration that could have a potential effect on safety, health, or the environment.
- Details of operational cost, capital required for construction relative to size, and ability of the operation/technology to scale up to various sizes such as 10,000, 20,000, 40,000 or more BPD. Preference given to respondents with prior documented and/or audited financial data relating to the aforementioned operational and capital costs.
- Daily and weekly summary performance data (see Appendix A).
- Establishment of sample ports within process as deemed necessary and of final product streams to support analytical needs and facilitate process performance assessment.
- Hourly conductivity testing of discharge streams for TDS monitoring.
- Coordinating provision and frequency of various process samples for the Consortium for detailed analytical assessment.
- Issuing of a final report of mass balance, energy balance, operational up time, operational challenges, operational upsets, causes, results, and possible resolutions

thereof.

## AWARD PROCESSING AND INFORMATION

A subset of the Consortium will assess all applications with a goal of selecting and establishing the perceived two best produced water desalination pilot projects for comprehensive evaluation; one in the Midland Basin and a second in the Delaware Basin. The minimum operational time shall be twelve (12) weeks with a maximum of twenty-four (24) weeks. Depending upon available funding and level of interest from respondents, the program may be continued to include other respondents' proposals for subsequent selection and operation.

## PROPOSAL CONTENT

**The proposal content and format must be followed. Failure to do so will result in disqualification.** Submissions failing to abide by the format will be allowed one opportunity to correct the non-conformance with resubmittal due within three (3) calendar days of notice.

### 1.) Overall Proposal Limitations:

The proposal text body, including cover letters, must not exceed eight (8) pages and shall be in 12 Pt Times Roman using one-inch margins and single-spaced text. All graphics may be attached within an appendices section not to exceed six (6) pages which could result in a maximum total of fourteen (14) pages.

### 2.) Page One: Cover Letter

### 3.) Page Two: Executive Summary

### 4.) Page Three through Eight: Main Body

- Description of the technology
- Technical and economic equipment capabilities
- Development status of the technology
- Terse details of pilot project safety, health and environmental preparations and related operational plans
- Project plan summary
  - Location of pilot project including operator/ownership of location if not under direct control of proposal party. Include evidence of agreement with owner/operator if latter is not the case.
  - Brief proposed operating plan including
    - source(s) of raw produced water
    - raw produced water storage facility/facilities

- methods of managing treated effluent and residual liquids/solids
  - Any other information deemed useful for proposal review mindful of proposal page limitations.
- A preliminary operating, health and safety plan. A more detailed operating plan will be required in the Technical Completion Report if project is selected.
- Pilot team qualifications
- Name and contact information for the primary contact for the planned pilot.
  - If you feel more than one individual needs to be included in any communications, you may add contact information for up to two (2) additional personnel.
  - Experience of personnel assigned to monitor the pilot with produced water treatment, wastewater treatment, the primary technology you will be piloting, proper sampling and testing protocol, and educational background of those involved with the pilot.
  - Education and experience for the inventor (or primary IP holder) for the technology that is being piloted.
  - If monitoring personnel watch the pilot in rotating shifts, explain the plan for rotating the various personnel (hours per day, days on / days off, etc.).

5.) Page nine through fourteen: Completed excel spreadsheet and Appendices

## FINAL TECHNICAL COMPLETION REPORT

A final technical completion report shall be submitted by the project period end date to the TXPWC Executive Director. It shall document and summarize the results of the project and will be prepared using the technical completion report format as follows:

- a. Title page
- b. Disclaimer
- c. Acknowledgements
- d. Informative abstract of 200 words or less
- e. Table of contents (including list of figures and/or tables)
- f. Justification of work performed
- g. Clearly stated project objectives that should reflect those included in the project proposal
- h. Detailed statements indicating the degree to which project objectives were achieved
- i. Review of materials and methods used
- j. Discussion of results and their significance
- k. Principal findings and conclusions
- l. Recommendations for additional research or application
- m. Summary

- n. References
- o. Appendix-water quality data for pilot operator-performed analytical testing in a specific format as defined by the consortium

Upon receipt and review of the final report, the TXPWC will provide analytical results from the comprehensive testing performed in line with the awarded project funding.

#### PROPOSAL SUBMISSION INFORMATION

Proposals shall be submitted electronically in PDF format via email. **On the “Subject” line of the email message, include “2024 TXPWC Produced Water Analytical Support RFP (Company Name).”** Completed proposals, as described below, must be emailed to **txpwc@ttu.edu** no later than **5:00 p.m. CDT on February 2, 2024**. Successful candidates will be notified no later than February 23, 2024. The planned project target start date is March 18, 2024. **PLEASE NOTE: If you have a project that you believe is qualified but will not be operational by March 18, you are still encouraged to submit as TXPWC will be making revolving timeline selections as funding allows.**

#### CONTACT INFORMATION

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**Executive Director, Texas Produced Water Consortium**  
**806-500-7986**  
**txpwc@ttu.edu**





## APPENDIX A

### Daily (hourly) and Weekly (daily average) Performance Data Summary

In the event the pilot is operated on a 24 hour per day basis, the above requested data should be gathered in an every other hour format.

Date

TDS (Hourly & Daily Average)

<u>Time</u>	<u>Inlet PW (TDS)</u>	<u>Product Water (TDS)</u>	<u>Brine (TDS)</u>	<u>Electricity (kWhr)</u>	<u>Gas (MMBTU/Hr)</u>
8:00					
9:00					
10:00					
11:00					
12:00					
13:00					
14:00					
15:00					
16:00					
17:00					

Daily Average  
End of Week Average

	<u>Feed Volume (BBLs)</u>	<u>Product Volume (BBLs)</u>	<u>Brine Volume (BBLs)</u>
8:00			
9:00			
10:00			
11:00			
12:00			
13:00			
14:00			
15:00			
16:00			
17:00			

Daily Total  
End of Week Average  
End of Week Total

kWh/BBL

MM BTU/BBL

Daily Average  
Weekly Average