# SIERRA CLUB
## LONE STAR CHAPTER

To: The Honorable Charles Perry, Chair, Senate Committee on Water, Agriculture and Rural Affairs Members, Senate Committee on Water, Agriculture, and Rural Affairs

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Sierra Club Lone Star Chapter, representing more than 21,000 members in Texas, submits the following comments on seawater desalination viability and regulatory efficiency in Texas. As the state chapter of one of the nation's oldest and largest conservation organizations, we have long been engaged on water issues in Texas. We appreciate the Committee's work on this charge and the opportunity to provide input.

Seawater desalination is one of the most expensive and complex ways to expand our water supply, and we strongly believe that it should be approached carefully, keeping in mind the needs of Texas communities and unique coastal ecosystems. While Texas has the tools and resources available, several important regulatory gaps remain and must be addressed before moving forward. This creates an opportunity to focus on the strategies that are already working in Texas, like water conservation, reuse, and reducing water loss, and seawater desalination should be treated as something that adds to these effective approaches, not replaces them.

Our main concern is that super-saline brine discharge in bays and estuaries can impact the ecology – and ultimately the economy – of local areas if a strong regulatory framework isn't in place, while seawater diversion from those same systems can similarly affect local ecologies and economies.

Below we highlight a few areas where we believe regulatory gaps exist, with more outlined in the attached factsheet.

***Offshore placement of both intake and discharge should be the preferred approach for any seawater desalination facility in Texas***.

The research directed by the 84th Texas Legislature to streamline permitting for seawater desalination plants in Texas has resulted in the identification of multiple environmentally suitable zones for seawater intake and brine discharge, generally located about 3 miles out into the

Gulf.[1] These recommendations are based on stronger circulation and dilution capacity offshore and negative ecological impacts from seawater diversion, where marine organisms can get stuck against the intake pipe screens (impingement) or drawn in with seawater (entrainment).

We believe that the public funding criteria should reflect these recommendations. Specifically, the state should follow the best available science and prioritize funding for projects proposing offshore intake and discharge in the zones identified by researchers to ensure long-term sustainability of seawater desalination in Texas.

***Texas doesn't currently have sufficient surface water quality standards for salinity.***

The absence of clear standards for salinity creates a fundamental gap in the state's ability to evaluate seawater desalination projects, particularly those proposing diversion and/or discharge within Texas bays and estuaries. A bill considered by the 89th Legislature (HB 3728) would have directed the development of such standards, but it didn't pass. Since then, there has been no clear public process outlining how and when salinity standards may be developed. A TCEQ public meeting on this issue scheduled for February of this year was canceled and hasn't been rescheduled, leaving the timeline uncertain.

We understand that establishing these standards isn't straightforward in Texas, where salinity levels vary naturally across coastal systems, making it difficult to set and apply uniform numeric thresholds. However, other states have addressed this challenge through narrative criteria. For example, Louisiana uses a combination of narrative criteria and biological indicators:

- *Narrative framework* that defines different types of water bodies based on typical salinity ranges and the specific aquatic species those waters are expected to support, and
- *Biological indicators,* where expected species and aquatic communities help to determine whether a water body is meeting its intended use.[2]

In practice, this means that if key species are absent or stressed, it can indicate that salinity levels are outside of acceptable thresholds. We believe that Texas can adopt a similar framework, and we encourage this Committee to consider such an approach. As it currently stands in Texas, evaluating project proposals on the permit-by-permit basis doesn't account for cumulative impacts of seawater desalination, particularly in the Coastal Bend region where multiple proposals are under consideration.

Thank you for the opportunity to provide these comments. For more information, please refer to the attached resources.

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[1] Texas Parks and Wildlife Department (TPWD) & Texas General Land Office (GLO). September 2018. *Marine Seawater Desalination Diversion and Discharge Zones Study*. Prepared pursuant to HB 2031, 84th Texas Legislature. Accessible at: https://tpwd.texas.gov/publications/pwdpubs/media/hb2031dz.pdf

[2] Louisiana Department of Environmental Quality, *Louisiana Water Quality Regulations and Standards*, Part IX Water Quality. Available at: https://www.deq.louisiana.gov/resources?pn=1&cat=33&d=0&y=0&q=

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# Seawater Desalination in Texas

*Seawater desalination is the process of removing salt from ocean water to produce fresh water. Given its economic, social, and environmental costs, seawater desalination in Texas should follow – and not replace – sustainable water management strategies.*

**Seawater Desalination At a Glance:**

- Texas currently doesn't have an operating seawater desalination plant, however 8 such facilities are currently recommended in the state water plan.
- Out of the 8 facilities, 5 are proposed to be located in Corpus Christi.
- Together, these 8 proposals would provide less than 4% of the new water supplies Texas plans to develop by 2080 (compared to approximately 30% from water conservation)
- The 8 proposed seawater desalination projects are estimated to cost roughly $11.4B in public funding, nearly 4 times the $2.8B estimated for 7 proposals in 2021.
- Two additional seawater desalination proposals – the Bayshore Desalination Facility in Galveston Bay and the RGV-Desal project in South Padre Island – are privately funded and aren't expected to seek public dollars at this moment.
- About half of desalinated seawater becomes fresh water and the other half becomes hypersaline concentrated brine, which must be disposed of; the least expensive option is to discharge brine into nearby bays and estuaries.
- The safest way to dispose of concentrated brine is to discharge it 3 miles offshore into the Gulf, where stronger currents can dilute it easily. While it can add to upfront project costs (e.g., one proposed project estimated about $264M for offshore discharge infrastructure), it helps better protect coastal ecosystems, communities, and economies.
- In addition to discharge impacts, pulling in seawater for treatment can harm marine life as larger organisms can become trapped on intake screens (impingement), while smaller organisms can be drawn into the system (entrainment).
- Texas Water Development Board (TWDB) makes decisions about state funding for seawater desalination facilities, and Texas Commission on Environmental Quality (TCEQ) is responsible for permitting both the diversion of seawater and the discharge of brine, along with any wastewater from the plant.
- Desalinated seawater is expensive: the 2026 TWDB regional water plans estimates range from about $2,300 to over $10,000 per acre-foot once full project costs are included (about $7 to $32 per 1,000 gallons).
- Seawater desalination is energy-intensive and can require about 3,000-4,300 kWh per acre-foot: if all 8 proposed plants were built, that's enough energy to supply the annual electricity needs for more than 100,000 Texas homes.

**Coastal Impacts:**

- Texas bays and estuaries produce 100M+ pounds of seafood products each year, worth $150-$250M annually.
- Saltwater recreational fishing generates an estimated $2B per year in Texas.
- The Texas coast is a biodiversity hotspot that attracts over 8M visitors and generates $5B annually from wildlife tourism alone.
- Because Texas barrier islands limit water circulation, brine discharged into bays and estuaries can accumulate and persist in sensitive habitats, forming “dead zones.”
- Without proper regulation, brine discharges can alter salinity in bays and estuaries in ways that can harm critical habitat for many species, including the federally endangered Kemp’s Ridley sea turtle, as well as fish, oysters, crabs, and shrimp.
- Nearly 7M Texans live in coastal counties, and hundreds of thousands work in fishing, tourism, shipping, and recreation industries that depend on healthy bays and estuaries.
- Unregulated seawater diversion and brine discharges can disproportionally affect Indigenous communities who depend on healthy coastal ecosystems for livelihoods, food, and cultural practices.

**Regulatory Gaps:**

- Texas lacks enforceable surface water quality standards for salinity, requiring only that *“salinity gradients in estuaries must be maintained to support attainable estuarine dependent aquatic life uses”* (TAC 30 §307.4(g)(3)).
- Texas allows seawater diversion from bays and estuaries, where marine life can be harmed through impingement and entrainment .
- Seawater desalination permits for discharges often rely on site-specific reviews instead of a comprehensive assessment of potential impacts across entire bays and estuaries.
- Neither TCEQ permitting nor TWDB funding criteria currently require seawater diversion and brine discharge to be located at least 3 miles offshore in environmentally suitable Gulf zones, despite Texas-specific scientific recommendations that resulted from previous legislative action.[3]
- Current permitting doesn't require applicants to demonstrate how brine discharges from multiple seawater desalination facilities could collectively raise salinity over time.

**Proposed Policy Solutions:**

- Require seawater desalination proposals seeking state funding to clearly demonstrate that other sustainable strategies – like water conservation, recycling, and loss mitigation – have been fully pursued and found insufficient to meet water demand.
- Prohibit seawater diversion from and brine discharge into Texas bays and estuaries.
- Direct TCEQ to establish enforceable surface water quality standards for salinity to protect bays and estuaries from concentrated brine discharges.
- Require seawater diversion and brine discharge to be located at least 3 miles seaward into the Gulf in environmentally suitable zones identified by scientists.

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[3] Texas Parks and Wildlife Department (TPWD) & Texas General Land Office (GLO). September 2018. *Marine Seawater Desalination Diversion and Discharge Zones Study*. Prepared pursuant to HB 2031, 84th Texas Legislature. Available at: https://tpwd.texas.gov/publications/pwdpubs/media/hb2031dz.pdf

- Limit state funding eligibility to facilities that propose seawater intake and brine discharge at least 3 miles offshore in environmentally suitable zones identified by scientists.
- Direct TCEQ to set strict permitting standards for design of water diversion systems to prevent impingement and entrainment of marine life.
- Require independent science-based environmental review for any proposed discharge, including analysis of site-specific salinity conditions, baseline ecological studies, and evaluation of cumulative impacts.
- Establish and fund long-term monitoring and adaptive management for seawater desalination in Texas.

***Seawater desalination proposals in the 2026 regional water plans***

| Project Name | Project Sponsor | Water Supply Amount (ac-ft/year) | Unit Cost (per ac-ft/ year) | Capital Cost |
|---|---|---|---|---|
| Barney Davis *(Region N)* | City of Corpus Christi | 33,627 | $3,705 | $582,000,000 |
| Inner Harbor Seawater Desalination *(Region N)* | City of Corpus Christi | 33,604 | $3,786 | $1,233,812,464 |
| La Quinta Seawater Desalination *(Region N)* | City of Corpus Christi | 44,806 | $3,460 | $1,141,000,000 |
| Harbor Island Seawater Desalination *(Region N)* | Port of Corpus Christi Authority | 112,014 | $3,616 | $3,456,000,000 |
| La Quinta Channel Seawater Desalination *(Region N)* | Port of Corpus Christi Authority | 33,627 | $3,452 | $844,000,000 |
| GCWA Coastal Desalination *(Region H)* | Gulf Coast Water Authority (GCWA) | 22,400 | $2,292 | $283,297,581 |
| Laguna Madre Water District Seawater Desalination *(Region M)* | Laguna Madre Water District | 5,600 | $3,821 | $127,001,000 |
| LCRA - Seawater Desalination *(Region K)* | Lower Colorado River Authority (LCRA) | 30,000 | $10,281 | $3,559,691,000 |
| ***Total water supply amount: 315,678 ac-ft/year*** | | | ***Total cost: $11,226,802,045*** | |

Texas Parks and Wildlife Department (TPWD) & Texas General Land Office (GLO). September 2018. ***Marine Seawater Desalination Diversion and Discharge Zones Study***. Prepared pursuant to HB 2031, 84th Texas Legislature. Available at: https://tpwd.texas.gov/publications/pwdpubs/media/hb2031dz.pdf

b) Discharge Zones

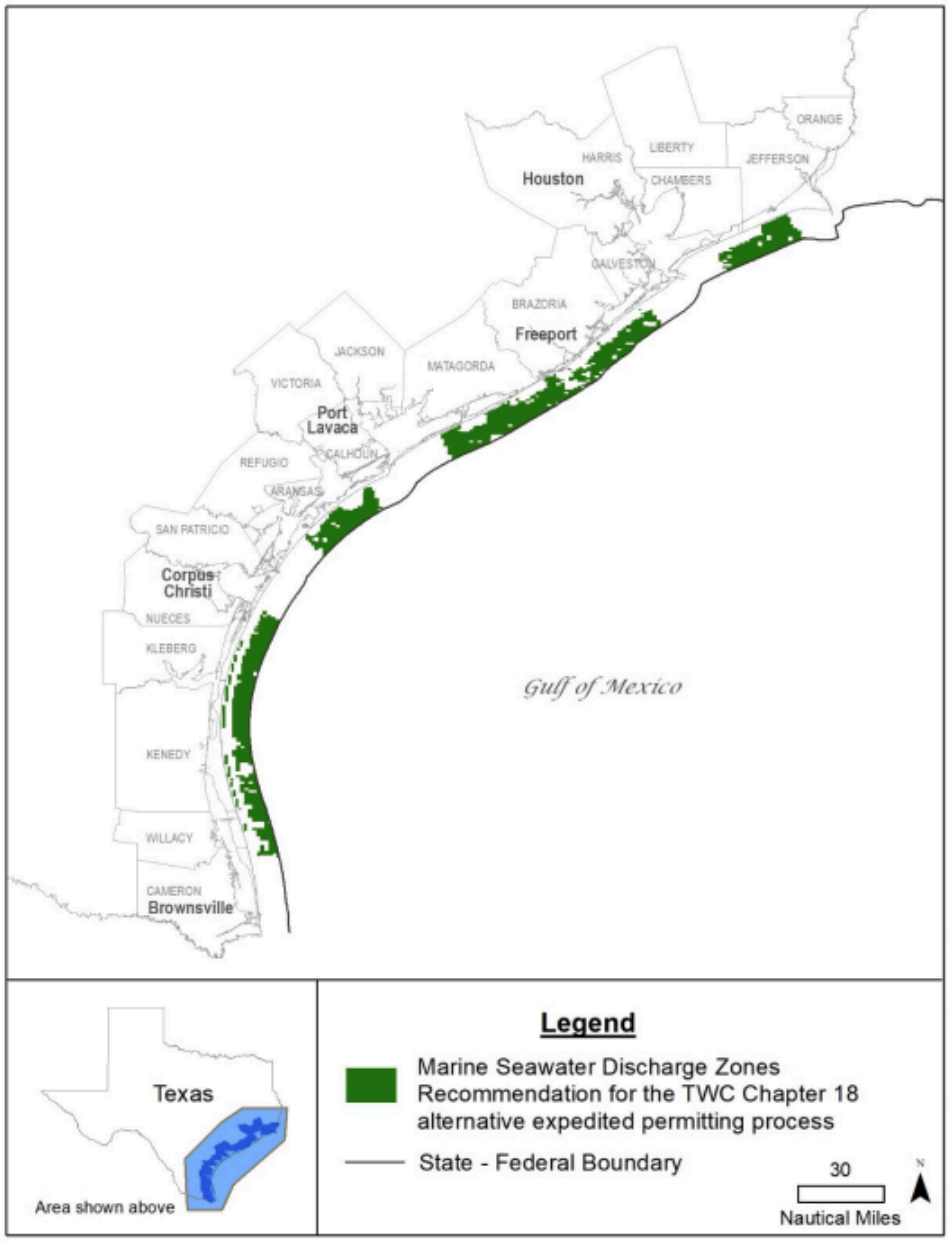


**Figure 6. Coastwide map of zones within Texas territorial waters (highlighted in green) recommended by TPWD and GLO as appropriate for the discharge of desalination waste into the Gulf of Mexico as required by HB 2031 (84th Legislature).**

Texas Parks and Wildlife Department (TPWD) & Texas General Land Office (GLO). September 2018. ***Marine Seawater Desalination Diversion and Discharge Zones Study***. Prepared pursuant to HB 2031, 84th Texas Legislature. Available at: https://tpwd.texas.gov/publications/pwdpubs/media/hb2031dz.pdf

c) Diversion Zones

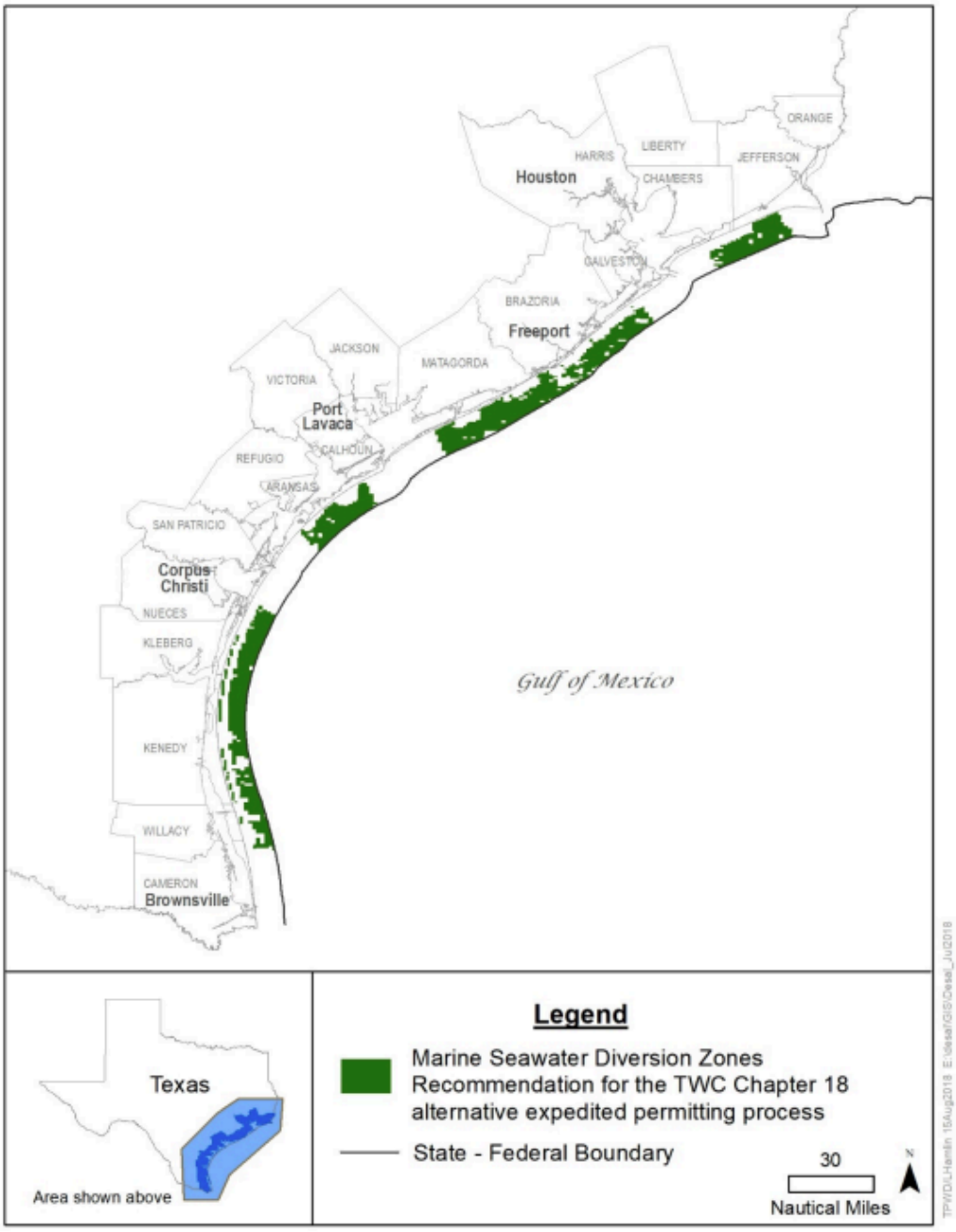


**Figure 7. Coastwide map of zones within Texas territorial waters (highlighted in green) recommended by TPWD and GLO as appropriate for the diversion of marine seawater from the Gulf of Mexico as required by HB 2031 (84th Legislature).**