Desalination: Seawater

With a 367-mile coastline along the Gulf of Mexico, Texas has access to an almost limitless, drought-proof supply of seawater. Desalination is the process that reduces total dissolved solids (~35,000 parts per million) in seawater to produce drinking potable water. However, the relatively high cost of seawater desalination when compared to traditional water supplies poses a challenge to implementing the first large-scale seawater desalination facility in the state.

Seawater Desalination Initiative

In 2002, the Texas Water Development Board (TWDB) established the Seawater Desalination Initiative to develop a proposal for building a large-scale seawater desalination plant. TWDB efforts began by funding feasibility studies in three locations (City of Brownsville, City of Corpus Christi, and City of Freeport).

Demonstration Projects

Taking another step forward, the TWDB funded two pilot-scale studies: one at the Brownsville Ship Channel conducted by the Brownsville Public Utilities Board and the second on South Padre Island by the Laguna Madre Water District.

The pilot plant study concluded that desalinating seawater was technically feasible, and the proposed scope was reduced to a 2.5-million-gallon-per-day (2,800 acre-feet per year) plant with an estimated cost of $22.5 million. The TWDB requested $9.5 million from the Texas Legislature to help construct the smaller project and did not receive the funding. The project was placed on hold, pending procurement of funds.

South Padre Island was not one of the three sites selected in 2003. However, Laguna Madre Water District completed feasibility, pilot plant, and environmental studies for the project. The proposed 1-million-gallon-per-day (1,120 acre-feet per year) desalination facility would cost an estimated $13.2 million. In May 2011, voters authorized the District to issue bonds to finance the construction of a seawater desalination facility. The District placed the project on hold while they explored indirect potable reuse.

Currently, M&G Resins USA, LLC is building a seawater desalination facility for industrial use with a design capacity of 22 million gallons per day (24,643 acre-feet per year) and bringing it online in the first quarter of 2017. Additionally, two seawater desalination feasibility studies, one for municipal and the other for industrial use, are being conducted in the Corpus Christi area. Seawater desalination is gaining momentum with the construction of the first desalination plant and enactment of recent legislation.

State Regulations

In 2015, the 84th Texas Legislature passed House Bill 2031 relating to the diversion, treatment, and use of seawater. The legislature also passed House Bill 4097 relating to the use of seawater desalination for industrial purposes. The overall goal of the legislation was to streamline and expedite the regulatory process associated with seawater desalination. In response, the Texas Commission on Environmental Quality created a new permitting process and made rules effective on December 8, 2016.

Biennial Report on Desalination

In 2003, the 78th Texas Legislature passed House Bill 1370 directing the TWDB to undertake or participate in research and demonstration projects to advance seawater desalination. The TWDB prepares a biennial report on the progress of seawater desalination activities in the state and submits it to the Texas Legislature no later than December 1 of each even-numbered year (Texas Water Code §16.060). The 2016 Biennial Report on Desalination is the seventh report in the series and marks the completion of 14 years toward advancing seawater desalination in Texas (www.twdb.texas.gov/innovativewater/desal/doc/2016_TheFutureofDesalinationinTexas.pdf).

Desalination in the 2017 State Water Plan

In the 2017 State Water Plan, four regional water planning groups (regions H, L, M, and N) include seawater desalination as a water management strategy. If these strategies are implemented, seawater desalination will produce about 116,000 acre-feet of new water supply per year by decade 2070. This constitutes about 1.4 percent of all recommended water management strategies.

More Information

To learn more about the TWDB's seawater desalination activities, please visit: www.twdb.texas.gov/innovativewater/desal.

Or please contact: Ms. Erika Mancha
erika.mancha@twdb.texas.gov, (512) 463-7932