

Brine disposal methods and challenges in Texas

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Innovative Water Technologies
Texas Desal 2018
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Unless specifically noted, this presentation does not necessarily reflect official Board positions or decisions.

Desalination Plant Database

- Initially developed in 2005
- Updated in 2009/2010 by TWDB staff
- Updated in 2015/2016 by TWDB staff
 - Interactive database
- Municipal desalination plants with a capacity ≥ 0.023 million gallon per day
- Self reported surveys
- Future may update on biennial basis

Access to the database

The screenshot shows the Texas Water Development Board website. The header includes the logo, a search bar, and social media links. The navigation menu highlights "Innovative Water". The main content area is titled "Desalination" and features a photograph of water splashing over rocks. Below the photo is a paragraph of text and a list of "2018 Meeting Announcements". A sidebar on the right contains a list of links, with "Desalination Plant Database" highlighted in yellow.

Desalination

In April 2002, Governor Rick Perry tasked the Texas Water Development Board (TWDB) with developing a proposal to build Texas' very first large-scale seawater desalination plant to produce drinking water. The following year, the Texas Legislature passed [House Bill 1370](#) directing the agency to undertake or participate in research, feasibility and facility planning studies, investigations, and surveys as needed to advance the development of cost-effective water supplies from seawater desalination in the state. TWDB has expanded its scope of desalination activities to include brackish groundwater, an abundant source of water supply in many areas of the state.

2018 Meeting Announcements

- [South Central Membrane Association 2018 Annual Conference and Expo "Membranes: Mystery to Mastery"](#), August 22-24, 2018, San Antonio, Texas
- [Texas Desal 2018](#), September 13-14, 2018, Austin, Texas

Worth Its Salt: a column spotlighting desalination plants

[San Antonio Water System's H2oaks Center](#)

Water for Texas Conference 2019

- Aquifer Storage and Recovery
- Brackish Resources Aquifer Characterization System
- Desalination**
 - Desalination Facts
 - Desalination FAQs
 - Desalination Projects
 - Desalination Maps
 - Desalination Plant Database**
 - Desalination in 2017 State Water Plan
 - Worth Its Salt
 - Desalination TWDB Documents
 - Desalination Useful Links
- Rainwater Harvesting
- Water Reuse
- Innovative Water Technologies Staff

The screenshot shows the Texas Water Development Board website. The header includes the logo, a search bar, and social media links. The navigation menu highlights "Innovative Water". The main content area is titled "WATER DATA Interactive" and features a list of interactive tools. A sidebar on the right contains a list of links, with "State Water Implementation Fund for Texas (SWIFT)" highlighted in orange.

WATER DATA Interactive

Water for Texas Conference 2019

- Interactive Apps and Maps
 - TWDB Maps
 - GIS Data
 - Map Resources
 - Data Services
- State Water Implementation Fund for Texas (SWIFT)**

TexMesonet

An application for viewing and accessing data from a network of selected weather stations and rain gages throughout Texas. The application includes an interactive weather map, historical weather, and data services. The [click to show more](#)

Texas FLOOD Viewer

An interactive mapping application for viewing current conditions and up-to-date information for flooding in your area.

Groundwater Data Viewer

This interactive mapping application provides access to water-related data for Texas. The viewer contains several GIS datasets relating to water resources, including TWDB groundwater data, brackish groundwater [click to show more](#)

Major Aquifer 3D Viewer

Desalination Plant Database

WATER DATA Interactive | Groundwater | Layers | Base Maps | Help | Disclaimer | Texas Water Development Board

Find address: [input field]

- TWDB Groundwater
- Brackish Groundwater
- Submitted Driller's Reports**
 - Well Reports
 - Plugging Reports
 - Desalination Plants**
 - Surface Water
 - Groundwater
 - Other

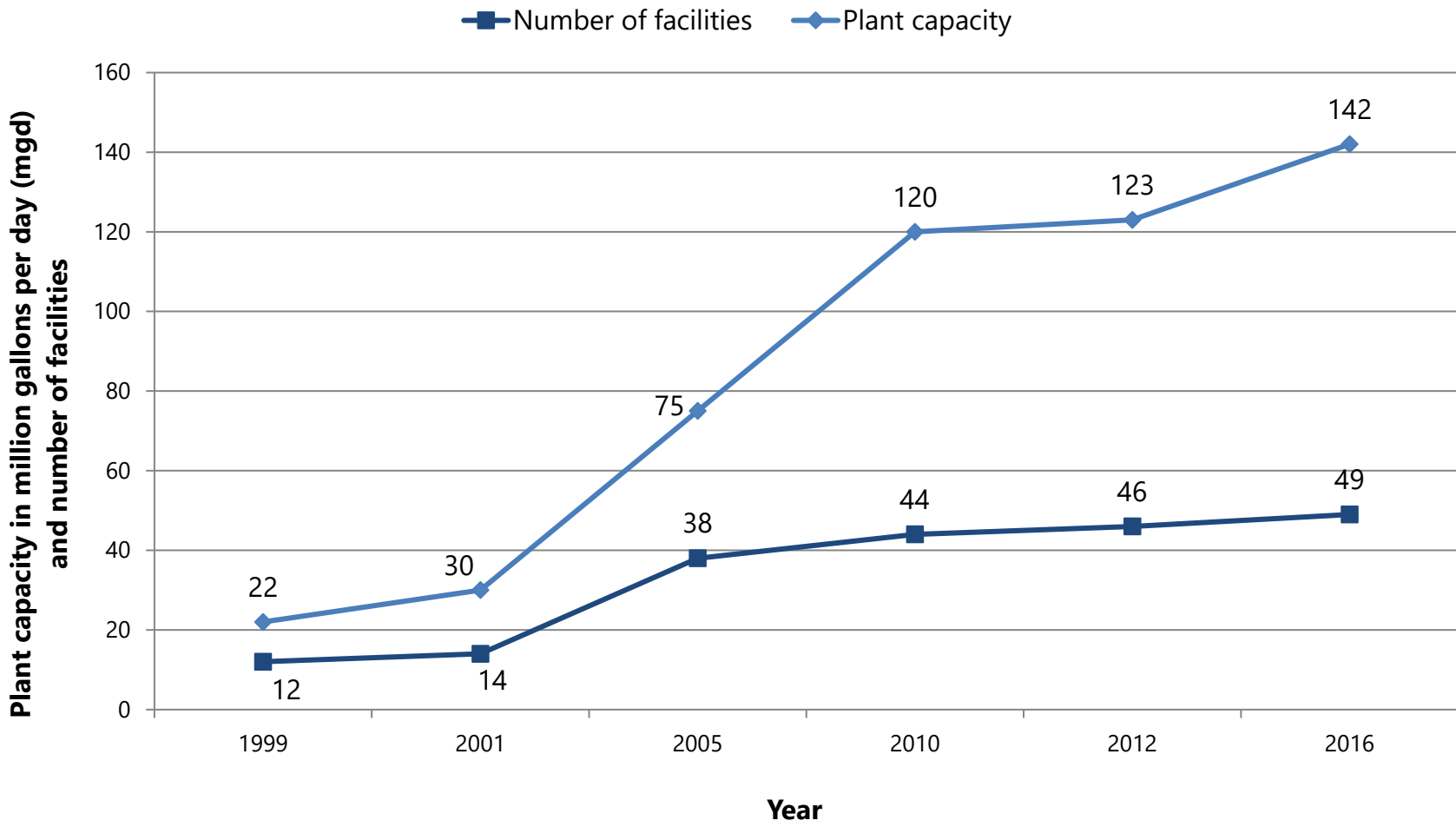
Desalination Plant

Desalination Plant Report:	View Report
Plant Name:	Veolia Water Treatment Plant (Idle)
County:	Jefferson
Plant Production - Design:	0.245
Water Source:	Surface Water
Raw Water Total Dissolved Solids (mg/L):	No Data
Operational Status:	Idle
Process Type(s):	Reverse Osmosis

Pointer - DMS: 38° 55' 49.34" N 101° 51' 28.12" W || DD: 38.930371 -101.857812

Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, NPS

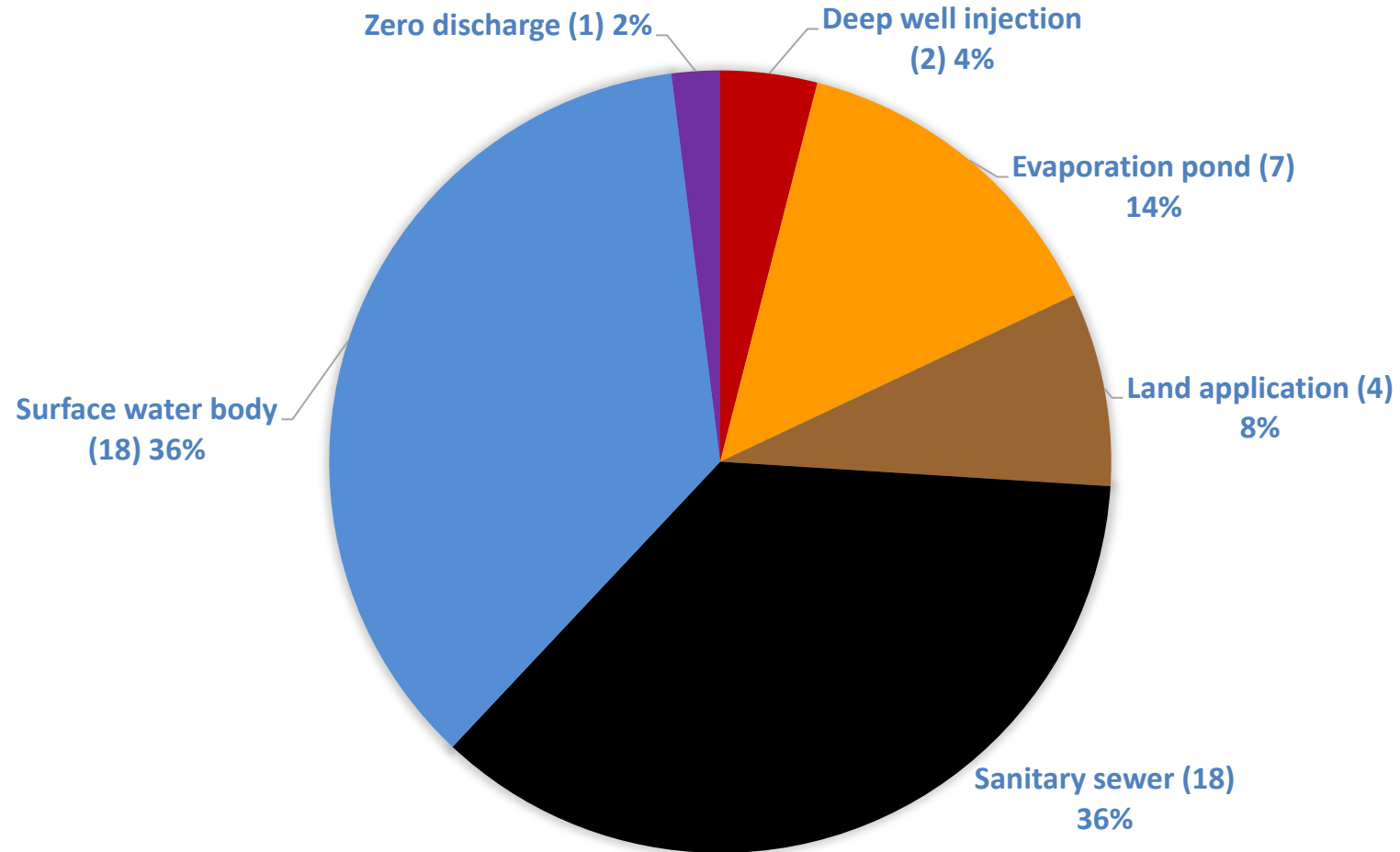
Desalination growth in Texas



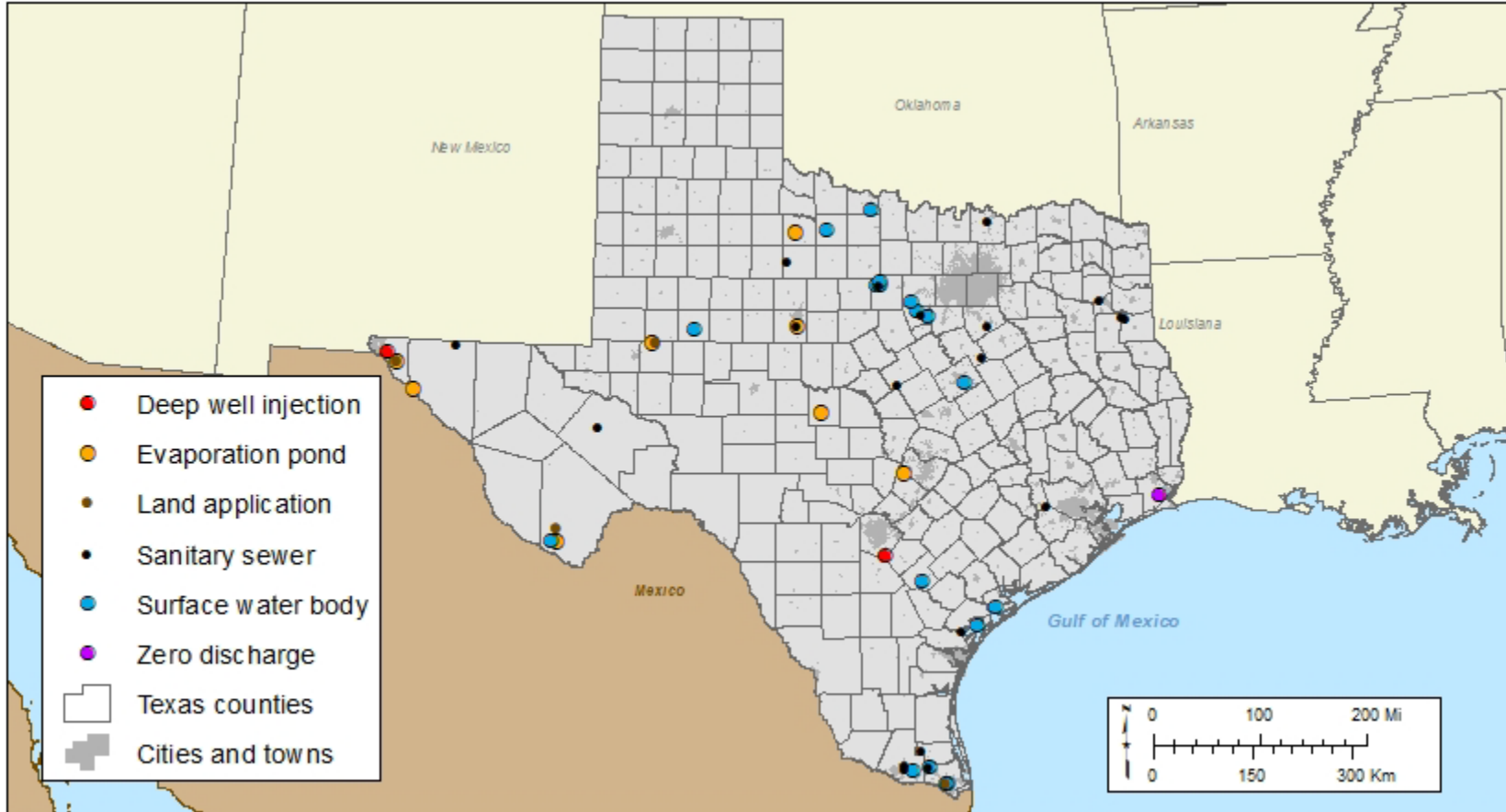
Highlights of database update

- Existing plants increased capacity
 - Southmost Regional Water Authority
 - Brazos Regional Public Utility Agency
 - City of Robinson
- New plants constructed
 - H2Oaks Center / San Antonio
 - City Benjamin
 - City of Rule
 - Mitchell County
 - Raw Water Production Facility /Big Springs
- Plant closures
 - City of Laredo Santa Isabel
 - Windermere Water System

Concentrate disposal methods for existing desalination plants



Concentrate disposal methods



Challenges to concentrate disposal

- High costs
- Access to land and surface water body
- Salinity and volume limitations
- Permitting process
- Environmental issues

TWDB-funded studies on concentrate

Contractor	Report title	Project description	Year funded	Funding amount
CDM Smith, Inc.	Permitting Guidance Manual to Dispose Desalination Concentrate into a Class II Injection Well	Develop an instruction manual and road map for permitting a Class II injection well as a Class I for disposal of concentrate.	2010	\$130,000
Ch2M Hill	An assessment of osmotic mechanisms pairing desalination concentrate and wastewater treatment	Investigated the use of RO concentrate as a draw solution in a forward osmosis process for recovering water from wastewater.	2010	\$90,000
San Antonio Water System	Evaluation of Concentrate Management and Assessment of the Vibratory Shear Enhanced Process	Conducted a pilot test to assess the cost and technical feasibility of the Vibratory Shear Enhanced Process as a tool for reducing the volume of desalination concentrate.	2007	\$205,000
University of Texas at Austin	Improving Recovery: A Concentrate Management Strategy for Inland Desalination	Investigated anti-scalant precipitation, and electrodialysis to increase recovery in reverse osmosis desalination of brackish groundwater.	2007	\$238,500
El Paso Public Utilities Board	Pilot Study to Demonstrate Volume Reduction of Reverse Osmosis Concentrate	Evaluated silica reduction in RO concentrate through the addition of lime, and application of the Vibratory Shear Enhanced Process. Also tested the use of seawater RO membranes to increase water recovery.	2007	\$228,557
University of Texas at Austin - Bureau of Economic Geology	Self-Sealing Evaporation Ponds for Desalination Facilities in Texas	Investigated regulatory requirements for developing a self-sealing evaporation pond.	2005	\$49,928

Contact information

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Innovative Water Technologies – Desalination Program

<https://www.twdb.texas.gov/innovativewater/desal/index.asp>