Spicewood Beach, Texas Drought Response Case Study
• US EPA Drought Response and Resilience Guide
  – Step-by-step approach for small and medium sized drinking water utilities to plan for and respond to drought
  – www.epa.gov

• Case Study in the Guide is the Spicewood Beach Drinking Water System
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<th>Infrastructure</th>
<th>Utilities</th>
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<tr>
<td><strong>Ed Yanoshita</strong></td>
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<td>General Manager</td>
<td>General Manager</td>
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<td>Corporate Development</td>
<td>Corix Utilities (Texas)</td>
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Corix at a Glance

- Corix Utilities is a leader in **sustainable water**, **wastewater** and **energy** utility infrastructure.
- We design, supply, build, finance, manage and own local utility infrastructure on behalf of educational, municipal, institutional, military and private sector customers.
OU Utility Partnership

50-year contract for operations, maintenance and asset management of:

- 18 MW Gas-Fired CHP Plant (STG)
- 15 MW Gas-Fired Co-Gen (CT)/10,000 Tons Chilling
- Steam Heat Distribution System and Tunnels
- 3 Chilled Water Plants and Distribution
- Potable Water Distribution/De-ionized Water
- Wastewater Collection
- Electricity Distribution
- Natural Gas Distribution

Corix Institute for Water and Sustainability

- Corix donation established the Institute and an endowed Faculty Chair position
- The OU WaTER Center is a program of the Corix Institute
Spicewood Beach is a small community of approximately 1,100 residents.

Located 40 miles northwest of Austin, Texas.

In 2011, the community began experiencing a prolonged severe drought.
Elevation 681  Lake at full capacity storage
Elevation 650  Mild water shortage (Stage 1)
Elevation 645  Moderate water shortage (Stage 2)
Elevation 640  Severe water shortage (Stage 3)
Elevation 630  Emergency Water Conditions (Stage 4)
Elevation 626.7  January 2012 level
Impact of the Drought

- Groundwater wells ceased producing sufficient supply
- Stage 4 Water Restrictions implemented
  - Limit of 8,000 gallons per month per household
  - No outdoor watering
- Daily water delivery by tanker truck
Innovative P3 Delivery

- **Innovative Partnerships:** Collective team effort by government agencies, elected officials, private company and the residents of the Spicewood Beach community

- **Innovative Project Financing:** Emergency federal grant funding, state agency funding, private funding and regional utility rate structure

- **Innovative Project Design:** Local operations/operator driven solution
Innovative Partnership

- **US Department of Agriculture**: Federal agency providing Drought and Disaster assistance

- **Texas Commission on Environmental Quality (TCEQ)**: State agency tasked to protect public health and its natural resources

- **Lower Colorado River Authority (LCRA)**: State agency that manages the water supply and environment of the lower Colorado River basin
Innovative Partnership con’t

• **Burnet County:** Home county of Spicewood Beach with a County government proactively addressing water issues

• **Spicewood Beach:** Close-knit with strong community spirit

• **Corix Utilities:** Private, investor-owned Utility
**Federal Emergency Grant Assistance:** Provided through US Department of Agriculture and available only to County or City government applicants

**State Funding:** Operation and Management contract, and sale of assets to Corix

**Private Funding:** Corix Operation and Management, and acquisition of the Spicewood Beach Water System from LCRA
Innovative Project Design

Design Challenges

- No viable nearby alternative groundwater source
- No interconnection option with another water system
- Needed affordable solution to mitigate impact on customer rates – many seniors on fixed incomes
- Timing was urgent

The Solution

- Infiltration gallery intakes connected to new pre-fabricated surface water treatment plant meeting TCEQ specifications
Innovation = Positive Outcome for Spicewood Beach

• Operator knowledge of local conditions led to solution!
• Infiltration gallery intakes using the same construction and design as typical groundwater wells
• Modular, pre-fabricated plant sections manufactured by Corix in BC, Canada, shipped by truck to site
• Existing components and pipe reused as much as possible
• Connection to existing groundwater wells left intact - to be primary water source when original wells recharged
Infiltration Gallery Construction

Drilling Rig

Finished Intake
Plant Construction

Building Slab

Setting Tanks in place

Water Treatment Plant

Outer Building Shell
Successful Outcome

- New water treatment plant began delivering water to the community on June 22, 2014
  - New plant blends in well with the community
  - Efficient integration of existing plant buildings and components
Capstone Course Case Study

- OU Engineering Science/Environmental Engineering Capstone Course - Spring Semester 2014

- Two case studies used
  - Ethiopia – mitigation of excess fluoride in drinking water
  - Spicewood Beach Water System
Questions