



UT Dallas Bioengineering and Sciences Building Water Conservation Trifecta



Rick Dempsey, PE
University of Texas at Dallas
Associate Vice President for
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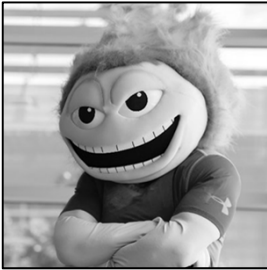
Shara Castillo, LEED AP BD+C
ZGF Architects LLP
Associate Partner



Kevin Masten
University of Texas at Dallas
Director of Research
Facilities Operations



About UTD



Founded in
1969

Rooted in
Research

8 schools
141
programs

28,000
Students

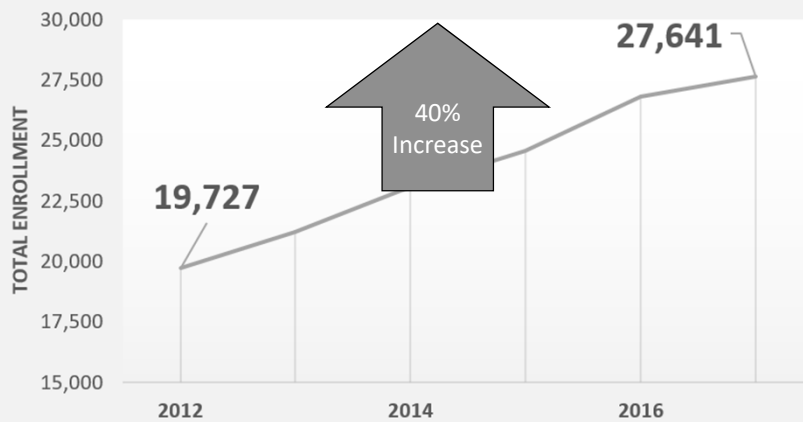
STEM
Focused

Young,
Geeky, and
Innovative!



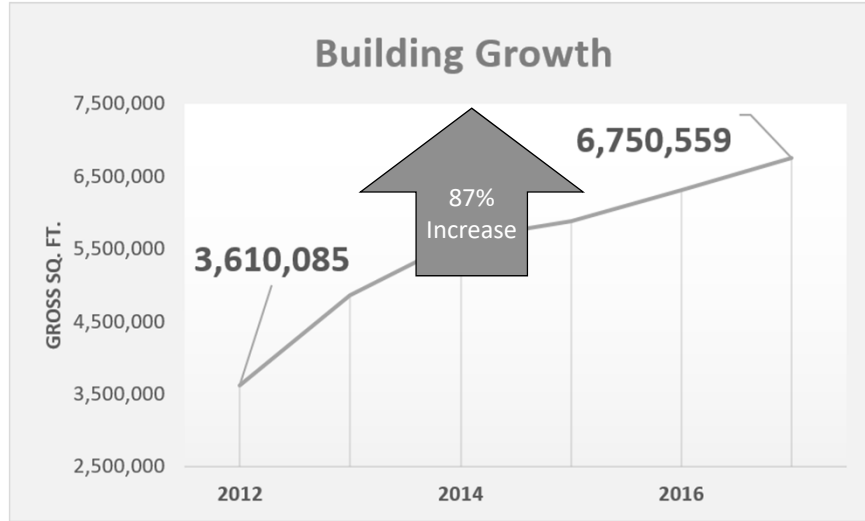
5 Years of Growth

Enrollment Growth

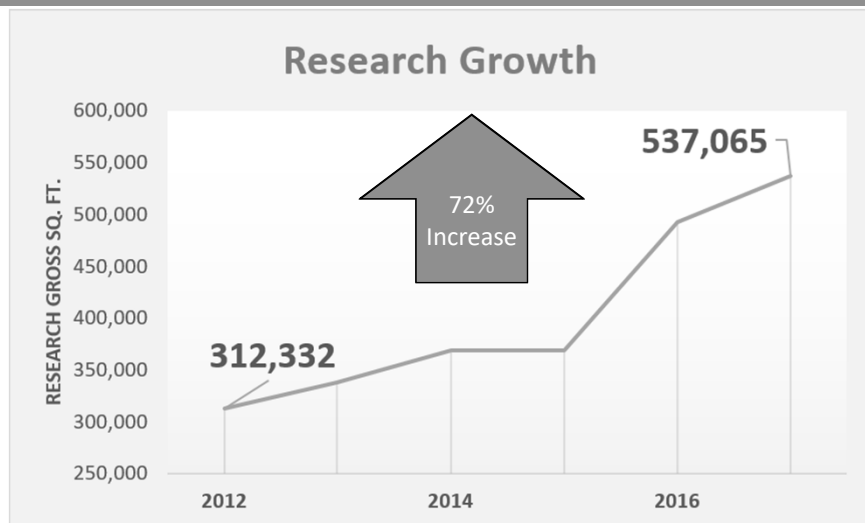




5 Years of Growth



5 Years of Growth





Bioengineering and Sciences Building (BSB) Project Overview



- **Size:** 222,651 gross square feet
- **Project Cost:** \$109,000,000
- **Project Completed:** Fall 2015
- **Research Programs:** Chemistry, Bioengineering, Neuroscience, Biomedical Science



About Bioengineering and Sciences Building



- **72 Research Labs**
- 690 work stations
- 142 offices
- 12 conference rooms
- 8 Integrated collaboration areas
- Connections to sister facility (NSERL)



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About Bioengineering and Sciences Building

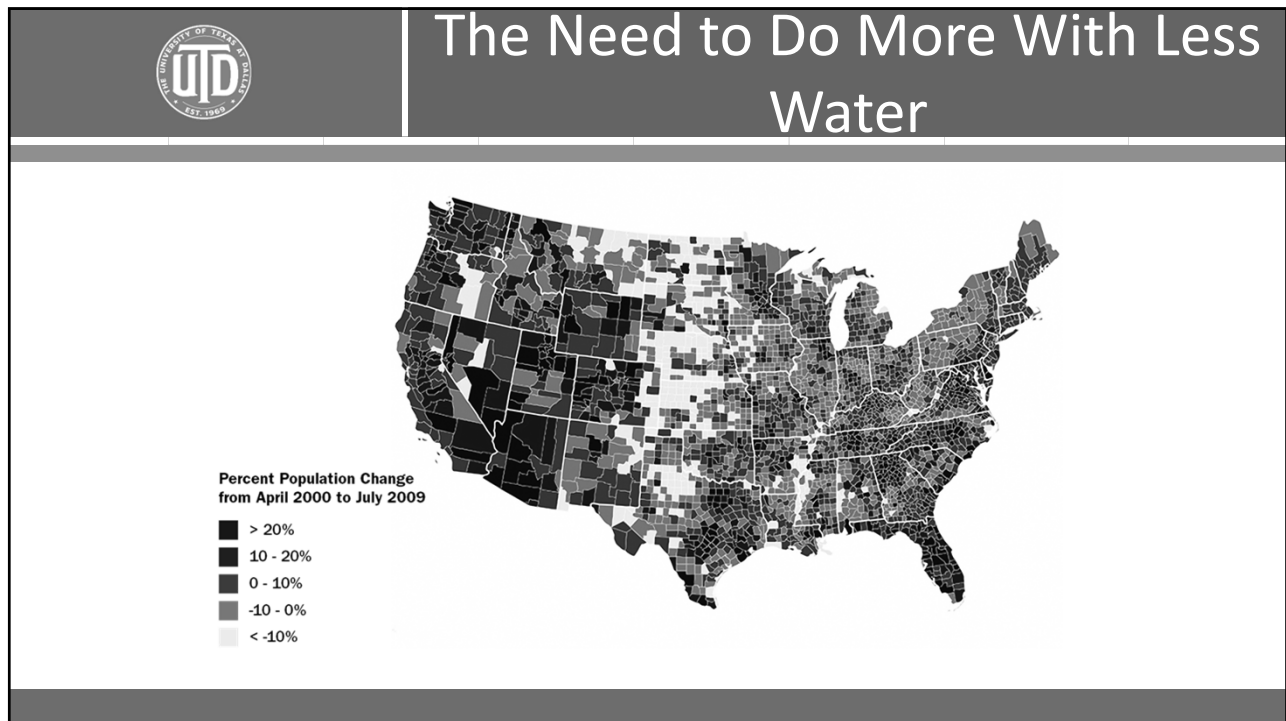


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Project Analysis
and Design

ZGF Architects LLP

Photo: Paulo Peres



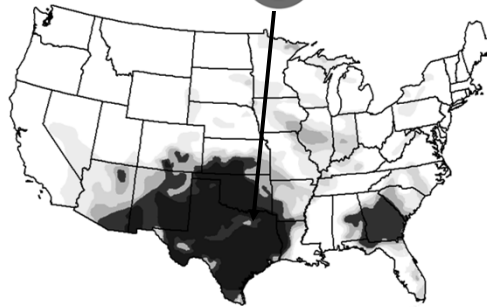


Regional Drought Calls for Innovation in Water Conservation

**U.S. Drought Monitor
CONUS**



September 6, 2011
(Released Thursday, Sep. 8, 2011)
Valid 7 a.m. EST



Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:
Mark Svoboda
National Drought Mitigation Center

USDA
<http://droughtmonitor.unl.edu/>

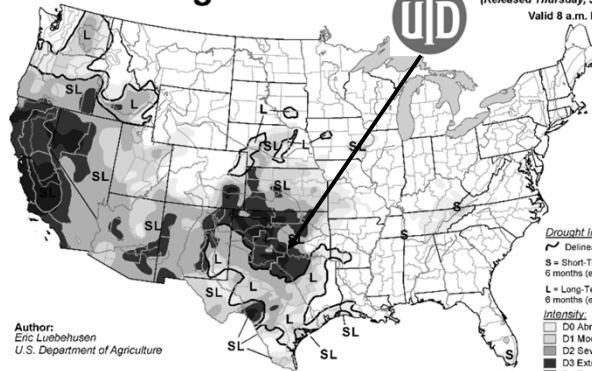


Regional Drought Calls for Innovation in Water Conservation

U.S. Drought Monitor



June 17, 2014
(Released Thursday, Jun. 19, 2014)
Valid 8 a.m. EDT



Author:
Eric Luebbehusen
U.S. Department of Agriculture

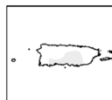
Drought Impact Types:

- S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)
- L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

Intensity:

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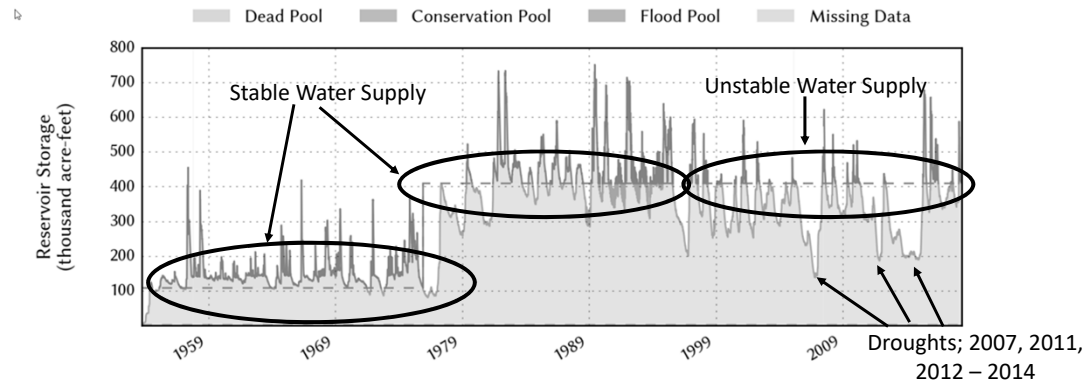


USDA
<http://droughtmonitor.unl.edu/>



Regional Drought Calls for Innovation in Water Conservation

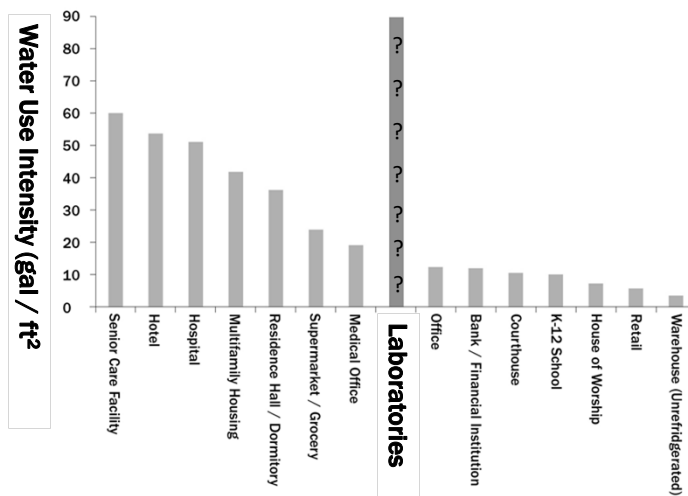
Lavon Lake: 100.0% full as of 2018-05-16



CS1

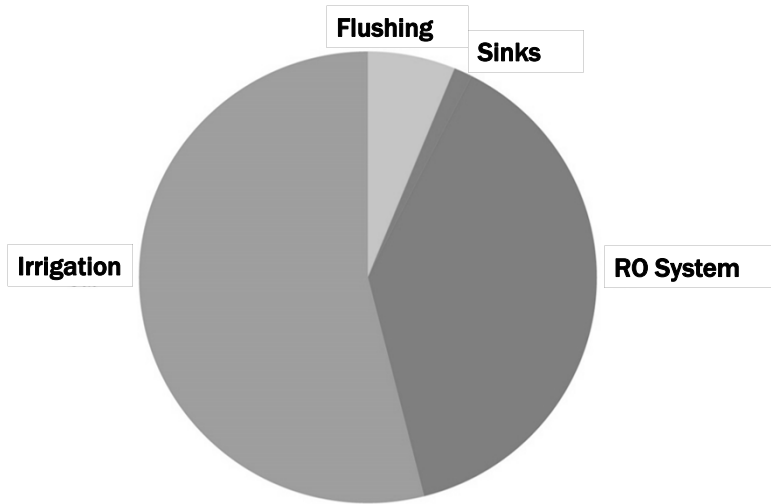


Laboratory Water Use





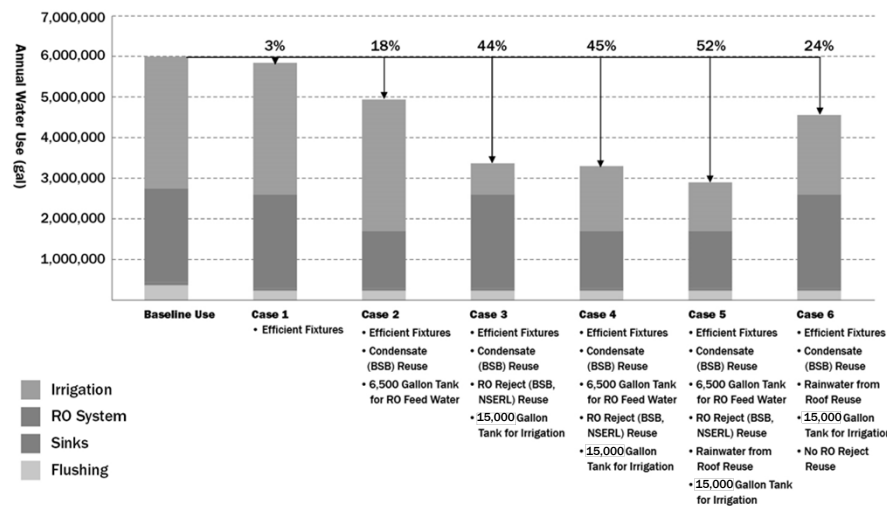
Projected Water Use



Analysis by ZGF Architects LLP



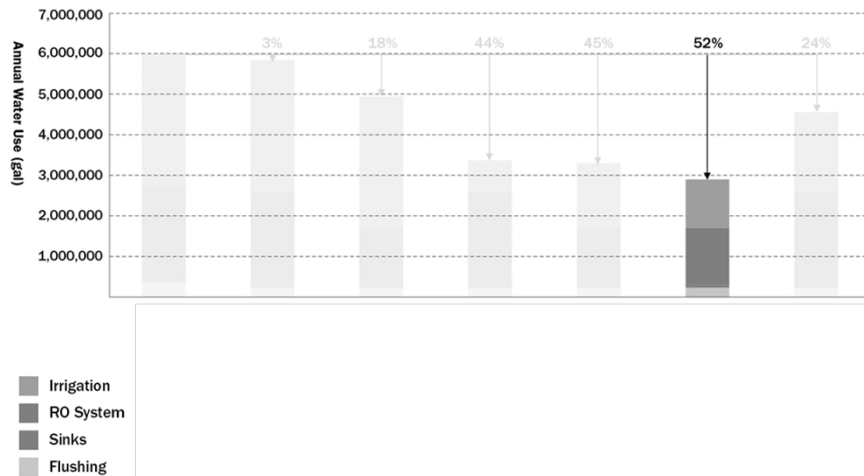
Water Analysis



Analysis by ZGF Architects LLP



Water Analysis



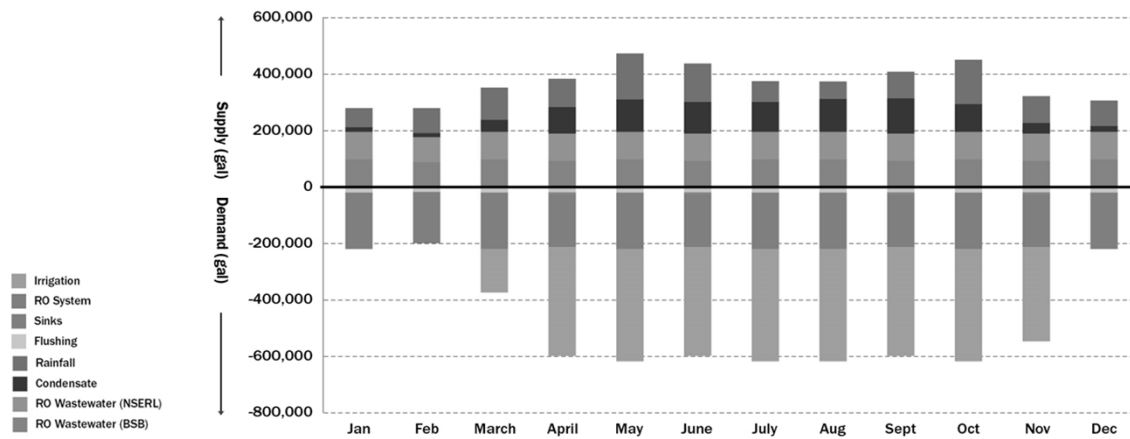
Case 5

- Efficient Fixtures
- Condensate (BSB) Reuse
- 6,500 Gallon Tank for RO Feed Water
- RO Reject (BSB, NSERL) Reuse
- Rainwater from Roof Reuse
- 15,000 Gallon Tank for Irrigation

Analysis by ZGF Architects LLP



Water Analysis



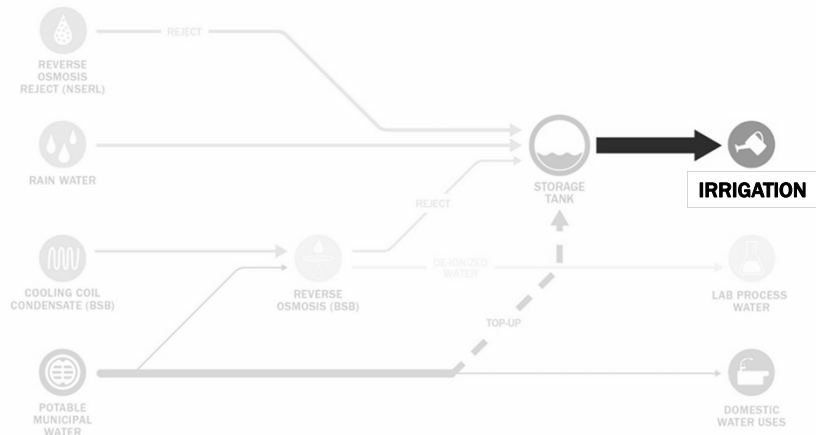
Analysis by ZGF Architects LLP



System Design

SOURCES

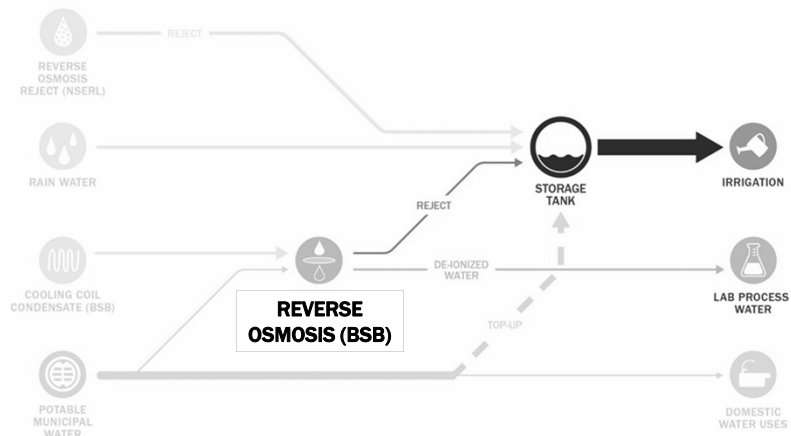
DESTINATION



System Design

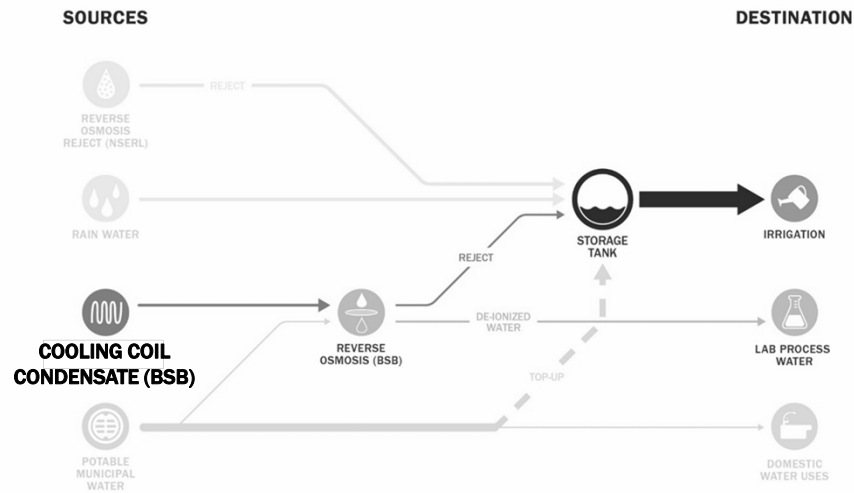
SOURCES

DESTINATION

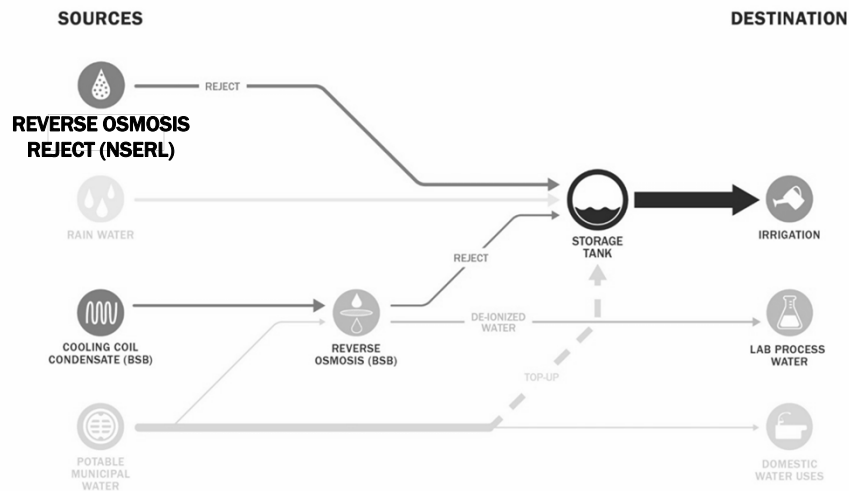




System Design

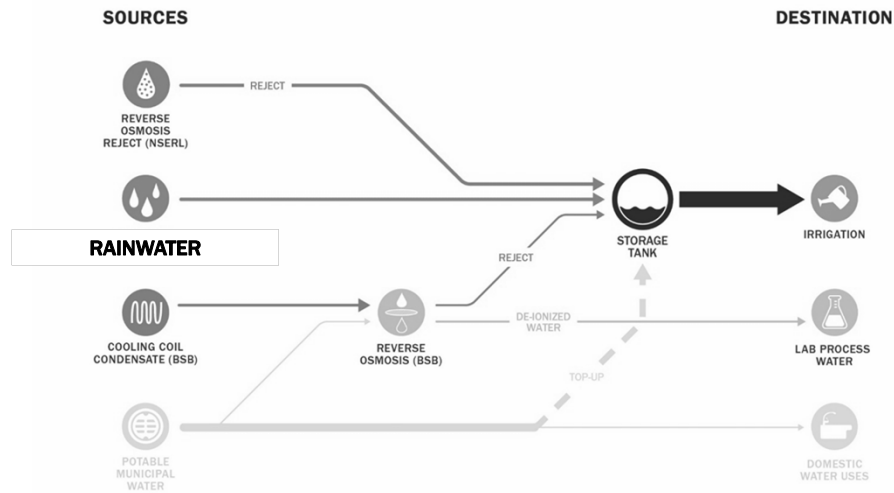


System Design

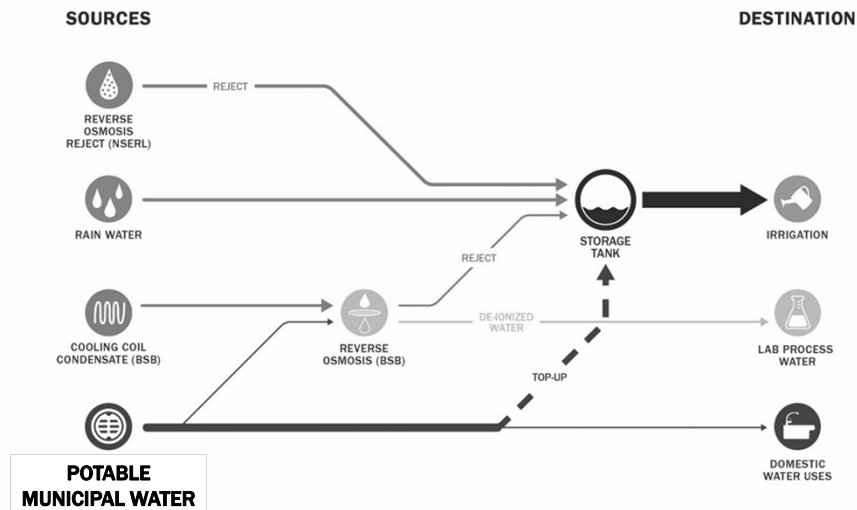




System Design



System Design






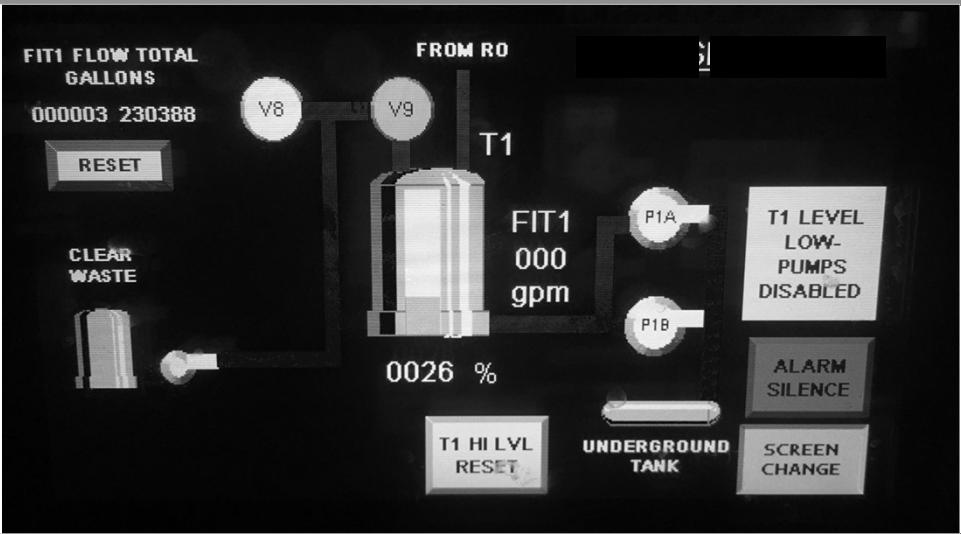
Construction,
Operation, and
Equipment



Kevin Masten
Director of Research Facilities Operations



NSERL RO Control Panel



FIT1 FLOW TOTAL GALLONS
000003 230388
RESET

CLEAR WASTE

FROM RO
V8 V9
T1
FIT1 000 gpm
0026 %
T1 HI LVL RESET

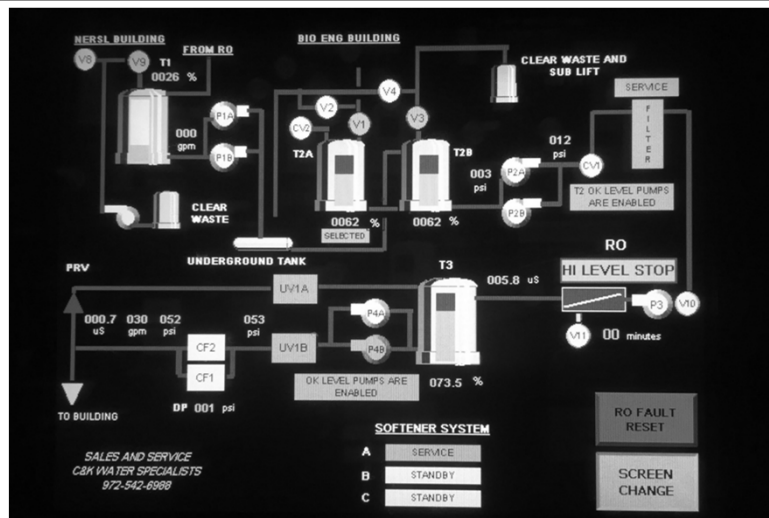
UNDERGROUND TANK
P1A P1B
T1 LEVEL LOW-PUMPS DISABLED
ALARM SILENCE
SCREEN CHANGE



BSB 15,000 Gallon Cistern



BSB Control Panel





BSB RO Controller, Membranes, and Storage



BSB Softener and Brine Tank





BSB Metering



Numbers and Outcomes



- 2.5 million gallons saved from RO capture
- Metering installation for other components in progress.
- Double value by capturing waste for reuse.
- Water costs have doubled over the last decade. Savings will magnify as cost of water rises.
- ROI will not justify project alone. Consider issues of regional importance and campus resiliency when planning.



A Solution That Makes Sense for UTD



Questions?