This presentation premiered at WaterSmart Innovations

watersmartinnovations.com
ICI and Multi-Family Water Conservation by the Numbers

Presented by
H.W.(Bill) Hoffman, PE
532 Christopher’s Cove
Lockhart, Texas 78644
billhoffmantx@earthlink.net
512-294-7193

at

WaterSmart Innovations 2019
What we will cover

• How much water is used in these sectors

• Breaking down city wide use - target conservation opportunities

• Where water is used – opportunities for targeted programs

• Seasonal use – the real numbers might surprise you
Withdrawal vs. Consumption

332 billion gallons a day in 2015

USGS and H.W.(Bill) Hoffman & Associates, LLC

Billions of Gallons per Day

Sector

Withdrawal
Consumption

Mining
18
7

Public Sup. / Domestic
42
14

Power
95
3

Agriculture
128
115
Water End Use in Texas Cities of 3,300 Population or More

Source: TWDB - Water Use of Texas Water Utilities

2013 2014 2015

Single-Family
47% 48% 48%

Multi-Family
9% 10% 10%

ICI & Other Business
44% 42% 42%
## Water Use of Texas Utilities

**TWDB 2015 - SB 181 Report**

### Gallons per Person per Day

<table>
<thead>
<tr>
<th>Category</th>
<th>Residential GPCD</th>
<th>ICI &amp; Other GPCD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large Significant ICI Utilities (5)</td>
<td>76</td>
<td>175</td>
</tr>
<tr>
<td>Medium-Large Significant ICI Utilities (5)</td>
<td>88</td>
<td>159</td>
</tr>
<tr>
<td>Metropolitan Utilities</td>
<td>69</td>
<td>170</td>
</tr>
<tr>
<td>Medium Significant ICI1 Utilities (27)</td>
<td>74</td>
<td>159</td>
</tr>
<tr>
<td>Large Utilities (30)</td>
<td>85</td>
<td>82</td>
</tr>
<tr>
<td>Medium-Large Utilities3 (31)</td>
<td>90</td>
<td>73</td>
</tr>
<tr>
<td>Medium Utilities (237)</td>
<td>79</td>
<td>62</td>
</tr>
</tbody>
</table>

### Water Use of Texas Utilities

**Residential GPCD**

- **Large Significant ICI Utilities (5)**: 76 GPCD
- **Medium-Large Significant ICI Utilities (5)**: 88 GPCD
- **Metropolitan Utilities**: 69 GPCD
- **Medium Significant ICI1 Utilities (27)**: 74 GPCD
- **Large Utilities (30)**: 85 GPCD
- **Medium-Large Utilities3 (31)**: 90 GPCD
- **Medium Utilities (237)**: 79 GPCD

**ICI & Other GPCD**

- **Large Significant ICI Utilities (5)**: 175 GPCD
- **Medium-Large Significant ICI Utilities (5)**: 159 GPCD
- **Metropolitan Utilities**: 170 GPCD
- **Medium Significant ICI1 Utilities (27)**: 159 GPCD
- **Large Utilities (30)**: 82 GPCD
- **Medium-Large Utilities3 (31)**: 73 GPCD
- **Medium Utilities (237)**: 62 GPCD
Commercial Water Use in Austin Texas

Water Use by Commercial/Institutional Users

- Offices: 20.1%
- Retail: 11.2%
- All Other: 11.0%
- Hotel: 9.0%
- Healthcare: 8.2%
- Restaurant/Bar: 7.6%
- Service Est.: 7.4%
- Schools: 6.6%
- Colleges: 6.0%
- Food Stores: 2.1%
- Commercial Warehouse: 1.8%
- Sanctuary: 1.6%
- Other Group Shelter: 1.5%
- Amusement-Recreation-Athletic: 1.4%
- Correctional Facility: 1.4%
- Service Station-Repair Garage: 1.0%
- Other Educational Bldg: 0.9%
- Industrial Warehouse: 0.7%
- Religious: 0.6%

Red = Food Svc. Generally Found
Hash mark = Food Svc Can Be Found
- Sacramento California
- Tacoma Washington
- Southern Nevada Water Auth.
- Athens Clark County Georgia
- American Water New Jersey
- Aurora Water Colorado
- Colorado Springs Colorado
Water Use by Type of Establishment

Source: WRF #4619

Figure 4.3 Water Usage by Primary Category

<table>
<thead>
<tr>
<th>Type</th>
<th>Water Use (kgal/year)</th>
<th>Percentage of Total CII Customer Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>AmW</td>
<td>425,929</td>
<td>12%</td>
</tr>
<tr>
<td>ACC</td>
<td>143,632</td>
<td>8%</td>
</tr>
<tr>
<td>AW</td>
<td>368,436</td>
<td>12%</td>
</tr>
<tr>
<td>SAC</td>
<td>1,035,120</td>
<td>12%</td>
</tr>
<tr>
<td>SNWA</td>
<td>14,396,063</td>
<td>34%</td>
</tr>
<tr>
<td>TAC</td>
<td>272,708</td>
<td>9%</td>
</tr>
</tbody>
</table>

Total Ten Category Usage (kgal/year)
### Indoor Use vs Other Uses

Source: WRF 3 4619

<table>
<thead>
<tr>
<th>Location</th>
<th>Indoor Use</th>
<th>Other Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retirement/Nursing Home</td>
<td>82%</td>
<td>18%</td>
</tr>
<tr>
<td>Eating/Drinking Place</td>
<td>84%</td>
<td>16%</td>
</tr>
<tr>
<td>Office Building</td>
<td>62%</td>
<td>38%</td>
</tr>
<tr>
<td>Health Care Facility</td>
<td>69%</td>
<td>31%</td>
</tr>
<tr>
<td>Retail Outlet</td>
<td>73%</td>
<td>27%</td>
</tr>
<tr>
<td>Lodging</td>
<td>82%</td>
<td>19%</td>
</tr>
<tr>
<td>Auto/Auto Service</td>
<td>72%</td>
<td>28%</td>
</tr>
<tr>
<td>School/College</td>
<td>64%</td>
<td>37%</td>
</tr>
<tr>
<td>Religious Building</td>
<td>60%</td>
<td>40%</td>
</tr>
<tr>
<td>Warehouse</td>
<td>56%</td>
<td>44%</td>
</tr>
</tbody>
</table>
Percent of Domestic (residential) Estimated to be for Outdoor Use

Source: H.W. (Bill) Hoffman & Associates LLC based on USGS Circular 1405 (Tables 1-14)

0-20 % outdoor
20-30 % outdoor
30-45% outdoor
Over 45 % outdoor
Commercial & Institutional Landscape use from ARID area

Percent of Use for Irrigation in Phoenix, Arizona

- Schools: 26.5%
- Total Combined CI: 26.5%
- Government
- Office
- Hotels
- Warehouses
- Restaurants/Bars
- Misc. Commercial
- Retail
- Medical Centers
- Motels

Percent of Total Use for Irrigation
Monthly Water Use Patterns – WRF #4619

City of Sacramento - Monthly Total Water Use by Customer Category

American Water - Monthly Total Water Use by Customer Category

California

New Jersey
Distribution of Monthly Water Use by 44 Office Buildings in Texas With Cooling Towers

Percent of Total Annual Use

Jan.  5.5%  Feb.  5.5%  March  6.2%  April  7.6%  May  9.5%  June  11.9%  July  12.1%  August  13.1%  Sept.  10.1%  Oct.  7.1%  Nov.  6.5%  Dec.  5.0%
Monthly Percent of Annual Use for 15 Hotels In New Mexico, Arizona, and West Texas  2011-2012

Percent of Annual Use

January: 6.8%
February: 7.4%
March: 9.6%
April: 8.2%
May: 8.6%
June: 9.0%
July: 10.2%
August: 9.1%
September: 8.4%
October: 8.2%
November: 7.2%
December: 7.4%
January 2012: 7.4%
February 2012: 7.2%
March 2012: 7.9%
April 2012: 8.7%
May 2012: 9.2%
June 2012: 9.2%
July 2012: 9.4%
August 2012: 8.6%
September 2012: 7.8%
October 2012: 7.6%
November 2012: 7.4%
December 2012: 9.0%
Pacific Institute 2000 Study in California

Waste Not - Want Not Appendix E.

Percent of Use

<table>
<thead>
<tr>
<th>Category</th>
<th>Restrooms</th>
<th>Kitchens</th>
<th>Laundry</th>
<th>Landscape</th>
<th>Miscellaneous</th>
<th>Cooling</th>
<th>Boiler</th>
<th>Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hotels</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Restaurants</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retail (non-grocery)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office Buildings</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospitals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Schools</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>k - 12 Schools</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grocery Stores</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commercial Laundries</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Percent of Use

- Restrooms
- Kitchens
- Laundry
- Landscape
- Miscellaneous
- Cooling
- Boiler
- Process
Cooling Towers
You may recognize the Building outlined in Green

Red circles show cooling towers

The Whitehouse and downtown DC
Percent Non-Indoor Use

Source: WRF #4619

The graph shows the percentage of non-indoor use across different locations and sectors. The locations include ACC - GA, Am. Water NJ, Aurora CO, Sacramento CA, Colorado Springs CO, and Tacoma WA. The sectors are retail, office buildings, lodging, and eating places. The y-axis represents the percentage of non-indoor use, ranging from 0% to 60%, and the x-axis lists the locations and sectors.
Impact of Geography on Cooling Water Use

Estimated Annual Office Water User per Ton Hour of Capacity at 4.0 Cycles of Concentration

How Water is Used in Texas
Facilities *With Cooling Towers*

Special Study of Audits in Austin, Dallas, and Fort Worth

<table>
<thead>
<tr>
<th>Facilities</th>
<th>Indoor Use</th>
<th>Landscape Irrigation</th>
<th>Cooling Towers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office Buildings (N=33)</td>
<td>29%</td>
<td>10%</td>
<td>61%</td>
</tr>
<tr>
<td>Middle Schools (N=5)</td>
<td>40%</td>
<td>3%</td>
<td>57%</td>
</tr>
<tr>
<td>Hospitals (N=4)</td>
<td>33%</td>
<td>30%</td>
<td>37%</td>
</tr>
<tr>
<td>High Schools (N=14)</td>
<td>35%</td>
<td>31%</td>
<td>34%</td>
</tr>
<tr>
<td>Elementary Schools (N=6)</td>
<td>43%</td>
<td>40%</td>
<td>17%</td>
</tr>
</tbody>
</table>

Percent of Total Use

*N = Number of Facilities in Sample*
**Smaller Hotels in the Southwest Without Cooling Towers**

- **Domestic**: 50%
- **Irrigation**: 16%
- **House Laundry**: 23%
- **Swimming Pool**: 1%
- **Guest Laundry**: 1%
- **Kitchen & Ice Machines**: 3%
- **Unaccounted For**: 6%
Hotel Water Use Based on Audits of 20 Larger Hotels

With Cooling Towers

- Domestic: 49%
- Cooling towers: 20%
- Laundry: 14%
- Pools: 2%
- Kitchen/ice machines: 10%
- Irrigation: 5%
HOSPITAL USE CHARACTERISTICS

Northern Climate

- Cooling Towers: 43%
- Toilets: 20%
- Other Plumbing: 8%
- Food Service: 8%
- Medical Equip.: 9%
- Boilers: 4%
- Leaks & Other: 8%

South & South West

- Cooling Towers: 43%
- Toilets: 20%
- Other Plumbing: 8%
- Food Service: 8%
- Medical Equip.: 9%
- Boilers: 4%
- Leaks & Other: 8%
How Water Is Used *Indoors* at Audited Facilities In Texas

*Audits in Austin, Dallas, and Fort Worth*

- Religious Facilities: 95% Restroom Use, 5% Food Service, 3% Other (medical, water treatment, laundry, leaks, etc)
- Convention Center: 94% Restroom Use, 3% Food Service, 3% Other (medical, water treatment, laundry, leaks, etc)
- Court House: 90% Restroom Use, 4% Food Service, 4% Other (medical, water treatment, laundry, leaks, etc)
- Service Stations: 84% Restroom Use, 16% Food Service, 3% Other (medical, water treatment, laundry, leaks, etc)
- Hospitals: 79% Restroom Use, 5% Food Service, 5% Other (medical, water treatment, laundry, leaks, etc)
- Senior Care Facilities: 72% Restroom Use, 25% Food Service, 3% Other (medical, water treatment, laundry, leaks, etc)
- Middle Schools: 66% Restroom Use, 17% Food Service, 16% Other (medical, water treatment, laundry, leaks, etc)
- Office Buildings: 62% Restroom Use, 10% Food Service, 28% Other (medical, water treatment, laundry, leaks, etc)
- High Schools: 62% Restroom Use, 13% Food Service, 24% Other (medical, water treatment, laundry, leaks, etc)
- Elementary Schools: 61% Restroom Use, 14% Food Service, 24% Other (medical, water treatment, laundry, leaks, etc)
- Hotels: 58% Restroom Use, 12% Food Service, 30% Other (medical, water treatment, laundry, leaks, etc)
- Community College: 41% Restroom Use, 58% Food Service, 2% Other (medical, water treatment, laundry, leaks, etc)
- Clinic: 38% Restroom Use, 62% Food Service, 1% Other (medical, water treatment, laundry, leaks, etc)
- Community Center: 31% Restroom Use, 68% Food Service, 1% Other (medical, water treatment, laundry, leaks, etc)
Percent Restroom Use by Type of Use

Based on 173 audits in Texas

<table>
<thead>
<tr>
<th>Type of Use</th>
<th>Toilets</th>
<th>Faucets/Lavatories</th>
<th>Showers/Bath</th>
<th>Urinals</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elementary/ Middle Schools</td>
<td>71%</td>
<td>12%</td>
<td>3%</td>
<td>13%</td>
<td></td>
</tr>
<tr>
<td>High Schools</td>
<td>62%</td>
<td>13%</td>
<td>8%</td>
<td>16%</td>
<td></td>
</tr>
<tr>
<td>Hospital</td>
<td>60%</td>
<td>20%</td>
<td>7%</td>
<td>11%</td>
<td></td>
</tr>
<tr>
<td>Community Colleges</td>
<td>59%</td>
<td>14%</td>
<td>6%</td>
<td>14%</td>
<td></td>
</tr>
<tr>
<td>Office</td>
<td>56%</td>
<td>11%</td>
<td>2%</td>
<td>29%</td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>52%</td>
<td>17%</td>
<td>10%</td>
<td>15%</td>
<td></td>
</tr>
<tr>
<td>Hotel</td>
<td>28%</td>
<td>22%</td>
<td>46%</td>
<td>2%</td>
<td></td>
</tr>
</tbody>
</table>

Percent Savings in Restrooms

- Toilets
- Faucets/Lavatories
- Showers/Bath
- Urinals
- Other
# Water Use By Type of Activity

<table>
<thead>
<tr>
<th>Facility Type</th>
<th>Domestic</th>
<th>Laundry &amp; Dry Cleaning</th>
<th>Cooling, Towers &amp; Boilers</th>
<th>Food Service</th>
<th>Medical / Lab Equipment</th>
<th>Landscape Irrigation</th>
<th>Water Features</th>
<th>Water Treatment</th>
<th>Washing &amp; Outdoor Cleaning</th>
<th>Alternate Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>K-12 Schools</td>
<td>X</td>
<td>X</td>
<td>?</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>?</td>
<td>?</td>
<td>X</td>
<td>?</td>
</tr>
<tr>
<td>Hospitals</td>
<td>X</td>
<td>?</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>?</td>
</tr>
<tr>
<td>Clinics of all types</td>
<td>X</td>
<td>?</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>?</td>
</tr>
</tbody>
</table>
Multi-Family Is Commercial?

They are *commercial* facilities supplying *domestic* users

- The **company** owns and operates the property for profit.
- The **company** is responsible for plumbing repairs.
- Unless the utility meters each apartment, the **company** pays the water bill.
- On-property uses (irrigation, pools, common laundry, etc.) are all on the **company** bill.
Multi-Family Irrigation Use Low in These Cities

Figure 3.2 Monthly residential water use patterns for New York City

Figure 3.5 Monthly residential water use patterns for Tampa Bay Water
Multi-Family Irrigation Use High in These Cities

**Figure 3.1** Monthly residential water use patterns for San Diego County Water Authority

**Figure 3.4** Monthly residential water use patterns for Denver Water
Residential Indoor Water Use 2016

AWWA 2016

- Toilet: 24.0%
- Shower: 20.4%
- Faucets: 19.1%
- Clothes Washer: 16.5%
- Leaks: 12.4%
- Dishwasher: 1.1%
- Bathtub: 2.6%
- Other: 3.8%
Estimated Change in

*Indoor Residential*

Per Capita Use in USA *a 55% Decrease*

Sources: AWWARF Studies
In Home Use
Black, Gray, & Other GPCD
Based on 2016 Residential End Use Study

- Toilet: 14
- Faucet: 11
- Shower: 11
- Clothes Washer: 10
- Leaks: 8
- Other: 3
- Bath: 2
- Dishwasher: 1

Gallons per Person per Day
Multi-Family Ratio of High Month to Low Month and Percent of Water Above Winter Use

<table>
<thead>
<tr>
<th>City</th>
<th>Ratio - High Month to Low Month</th>
<th>Percent of Water Above Winter Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tampa</td>
<td>1.06</td>
<td>24%</td>
</tr>
<tr>
<td>New York</td>
<td>1.07</td>
<td>22%</td>
</tr>
<tr>
<td>San Diego</td>
<td>1.23</td>
<td>10%</td>
</tr>
<tr>
<td>New York</td>
<td>1.48</td>
<td>2%</td>
</tr>
<tr>
<td>Tampa</td>
<td>1.89</td>
<td>0%</td>
</tr>
</tbody>
</table>

Ration - High Month to Low Month

Low to High Month Ratio
WRF 4554 Study of Multi-Family Dwellings

## Distribution of 2014 multi-family annual use per dwelling unit for four water utilities

<table>
<thead>
<tr>
<th>Metric</th>
<th>Denver</th>
<th>New York City</th>
<th>Phoenix</th>
<th>Tampa Bay Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Premises</td>
<td>12,178</td>
<td>382,631</td>
<td>5,914</td>
<td>19,606</td>
</tr>
<tr>
<td>Number of Dwelling Units</td>
<td>192,560</td>
<td>2,143,108</td>
<td>181,101</td>
<td>280,865</td>
</tr>
<tr>
<td>Grand Mean (Units-weighted, gpud)</td>
<td>133.4</td>
<td>170.0</td>
<td>181.6</td>
<td>117.5</td>
</tr>
<tr>
<td>Premise-Level Mean (gpud)</td>
<td>148.0</td>
<td>166.8</td>
<td>192.8</td>
<td>146.3</td>
</tr>
<tr>
<td>Premise-Level Std. Deviation</td>
<td>95.3</td>
<td>164.9</td>
<td>656.4</td>
<td>655.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Quantiles (gpud)</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum</td>
<td>0.0</td>
<td>-314.6</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>1st</td>
<td>9.6</td>
<td>4.1</td>
<td>7.0</td>
<td>4.1</td>
</tr>
<tr>
<td>5th</td>
<td>45.9</td>
<td>34.8</td>
<td>45.2</td>
<td>28.5</td>
</tr>
<tr>
<td>10th</td>
<td>60.3</td>
<td>54.3</td>
<td>67.2</td>
<td>40.9</td>
</tr>
<tr>
<td>25th</td>
<td>86.5</td>
<td>88.1</td>
<td>107.2</td>
<td>64.3</td>
</tr>
<tr>
<td><strong>50th (Median)</strong></td>
<td><strong>127.4</strong></td>
<td><strong>136.6</strong></td>
<td><strong>157.8</strong></td>
<td><strong>97.4</strong></td>
</tr>
<tr>
<td>75th</td>
<td>187.4</td>
<td>205.6</td>
<td>220.6</td>
<td>144.9</td>
</tr>
<tr>
<td>90th</td>
<td>256.2</td>
<td>292.4</td>
<td>292.5</td>
<td>217.2</td>
</tr>
<tr>
<td>95th</td>
<td>312.3</td>
<td>369.9</td>
<td>351.8</td>
<td>282.0</td>
</tr>
<tr>
<td>99th</td>
<td>468.5</td>
<td>646.2</td>
<td>585.1</td>
<td>593.3</td>
</tr>
<tr>
<td>Maximum</td>
<td>1,754.8</td>
<td>9,544.7</td>
<td>34,838.1</td>
<td>37,204.1</td>
</tr>
</tbody>
</table>
Industrial Water Use

• Manufacturing
• Electric Power Production
• Mining
US Industrial Output Index vs Industrial Water Use

Index of Chained Dollars of Industrial Output (2009 = 100) VS Industrial Use in Billions of Gallons per Day
Sources: USGS and US Federal Reserve Economic Data
Typical Industrial Water Use Breakdown in Texas

- Chemicals
- Electricity
- Oil Refining
- Mining
- Paper
- Metals
- Food

- Cooling
- Boiler
- Process
- Other
Large Chrome Plating Operation

- Rectifier Cooling: 44%
- Evaporation: 31%
- Plating Use: 16%
- Domestic: 5%
- Boiler: 2%
- Scrubber: 2%
Seasonal Distribution of Use for Industrial Water Use in Texas from 2010 Through 2015

- Manufacturing
- Power
- Mining/Other
Water Use Breakdown for Two Breweries

<table>
<thead>
<tr>
<th>Use</th>
<th>Larger</th>
<th>Smaller</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment Cleaning</td>
<td>60%</td>
<td>56%</td>
</tr>
<tr>
<td>Water in Beer</td>
<td>23%</td>
<td>21%</td>
</tr>
<tr>
<td>Packing</td>
<td>7%</td>
<td>10%</td>
</tr>
<tr>
<td>Cooling Towers</td>
<td>4%</td>
<td>0%</td>
</tr>
<tr>
<td>Other Uses</td>
<td>6%</td>
<td>13%</td>
</tr>
</tbody>
</table>
No Water
No Beer!
Conclusion and Observations

• If you don’t measure it, you can’t know where you are going

• Knowing how water is used in the multi family and CII sectors can help direct the direction of the program

• Each utility is unique
Four Takeaways

1. Each utility water use profile is different – *You need to gather YOUR data.*

2. Know the type of CIU users in your area and quantify multi-family use.

3. Target those areas of highest potential

4. Seek Professional help where needed
Questions?
The End