

***Welcome!***

**Onsite Water Reuse Summit:  
Integration of Science, Policy, and Operation for  
Safe and Effective Implementation**

April 10, 2024



National Blue Ribbon  
Commission  
for Onsite Non-potable  
Water Systems



Review today's agenda

***Deploying Onsite Treatment Systems  
and Lessons Learned Part 1 –  
Implementing in San Francisco and  
Washington, D.C.***



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# Onsite Water Reuse Summit

## April 10, 2024



**Dr. Robert Bornhofen**  
Innovation Director, DC Water

**Problem:** Not enough office space, multiple office space leases, \$\$\$, disconnected staff

**Solution:** A centralized, stunning, state-of-the-art, 151,300 s.f. building for up to 350 people

**Rationale:** Demonstrated Commitment to Responsible Water Reuse & Energy Conservation

- ✓ “Building of the Future” ... Today!
- ✓ Leed Platinum Class A Building
- ✓ Wastewater Thermal Energy
- ✓ ~50% Energy Realization
- ✓ Non-Potable Water Reuse
- ✓ Revenue Generation
- ✓ Host Events (60 in 2022)
- ✓ Natural Light, Tinted Sun Shades
- ✓ Sits on top of an Active Pump Station



2016 – 2018 Ribbon Cutting

# HQO Investment: US\$55M

**ROI:** ~13 Year Break-Even Point (lease avoidance, \$ IAC, lower costs, revenue generation)

**ERU:** An Equivalent Residential Unit is a billing unit for the amount of storm water runoff from the impervious area of the average-sized residential parcel

		Current FY 2024 (Effective 10/1/2021)		Proposed FY 2025 (Effective 10/1/2024)		Proposed FY 2026 (Effective 10/1/2025)	
Area (Square Feet)	ERU	ERU Rate	Monthly Cost	ERU Rate	Monthly Cost	ERU Rate	Monthly Cost
100-699	0.6	\$21.86	\$13.12	\$21.23	\$12.74	\$24.23	\$14.54
700-2,099	1.0	\$21.86	\$21.86	\$21.23	\$21.23	\$24.23	\$21.86
2,100-3,099	2.4	\$21.86	\$52.46	\$21.23	\$50.95	\$24.23	\$58.15
3,100-7,099	3.8	\$21.86	\$83.07	\$21.23	\$80.67	\$24.23	\$92.07
7,100-11,099	8.6	\$21.86	\$88.00	\$21.23	\$182.58	\$24.23	\$208.38
11,100 and more	13.5	\$21.86	\$295.11	\$21.23	\$286.61	\$24.23	\$327.11

# Impervious Area Charge (IAC)

## Incentives (IAC Discounts) of up to 55%

### Eligibility Criteria: DC Resident, Good Standing with DC Water



**Green roofs** are designed so that rain is absorbed by the plants and other growing media.



**Rainwater harvesting** is the process of collecting rainwater from impervious surface for future use.



**Pervious Pavers** allow water to seep around and through paved surface and soak naturally into the ground.



**Bioretention** systems capture & store stormwater runoff pass pass it through a filter bed of engineered soil media composed of sand, soil, & organic matter.

# Non-Potable Water Capture & Reuse



**HighDRO<sup>®</sup>-Pure**  
Rainwater Harvesting Systems

# Non-Potable Water Capture & Reuse

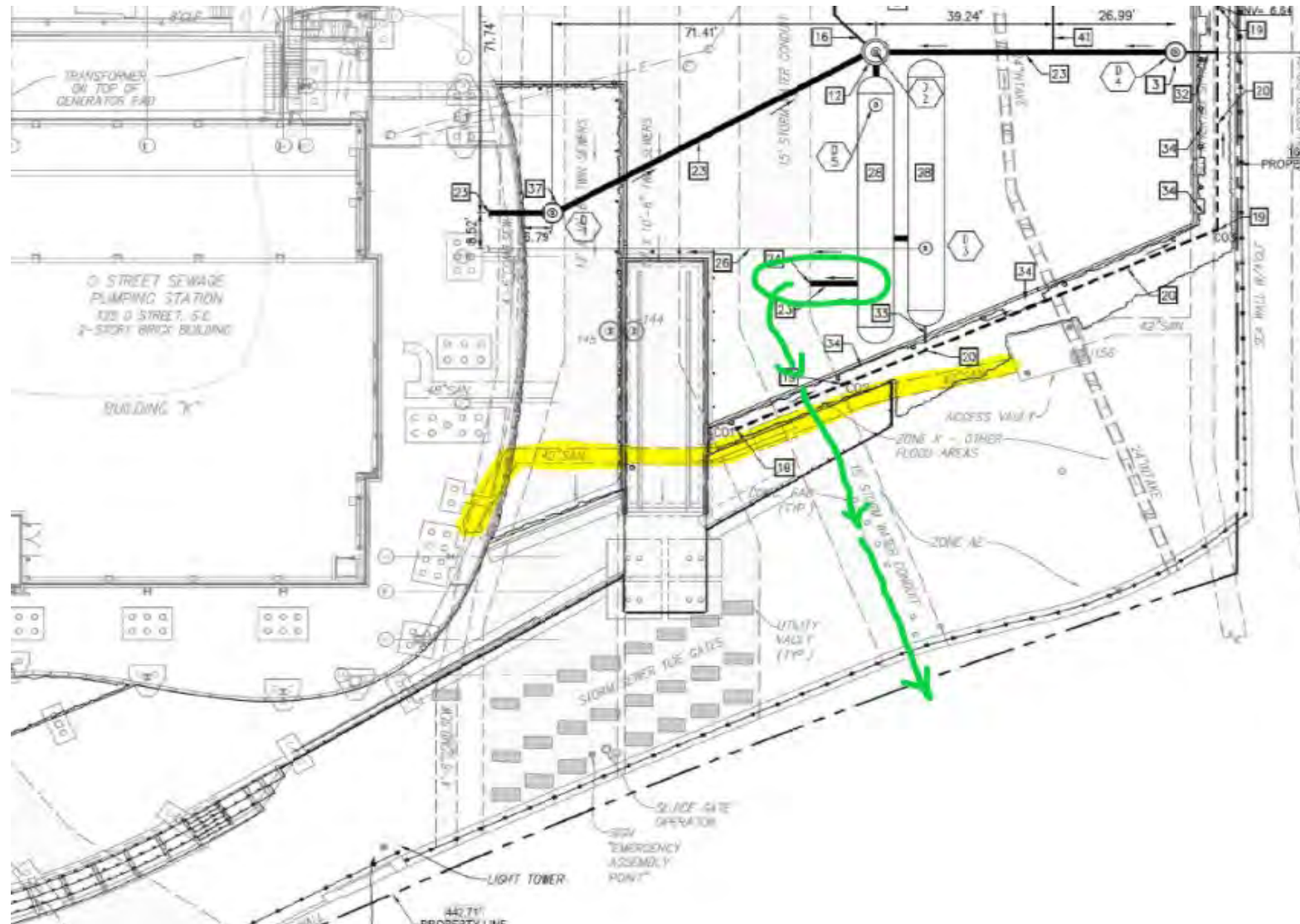
## January to December 2023 - City and Reclaimed Water Data

Read Date	Consumption (cf)	City Water Consumption (Gallons)	Reclaimed Water, Readings (gallons)	Reclaimed Water, Usage (gallons)
2023-01-01T00:00:00	6425.6	48,066.83	354,100	35,000
2023-02-01T00:00:00	6358.5	47,564.89	392,400	38,300
2023-03-01T00:00:00	10650.2	79,669.03	396,400	4,000
2023-04-01T00:00:00	9772.4	73,102.63	399,700	3,300
2023-05-01T00:00:00	4972.2	37,194.64	443,300	43,600
2023-06-01T00:00:00	8087.9	60,501.70	490,100	46,800
2023-07-01T00:00:00	1493.9	11,175.15	539,700	49,600
2023-08-01T00:00:00	6758	50,553.35	581,000	41,300
2023-09-01T00:00:00	8744.3	65,411.91	628,900	47,900
2023-10-01T00:00:00	10467.6	78,303.09	664,900	36,000
2023-11-01T00:00:00	5314.1	39,752.23	672,100	7,200
2023-12-01T00:00:00	1674.9	12,529.12	742,900	70,800

Average over 9 months = **45,478 reclaimed gallons used / month**



# Non-Potable Water Capture & Reuse

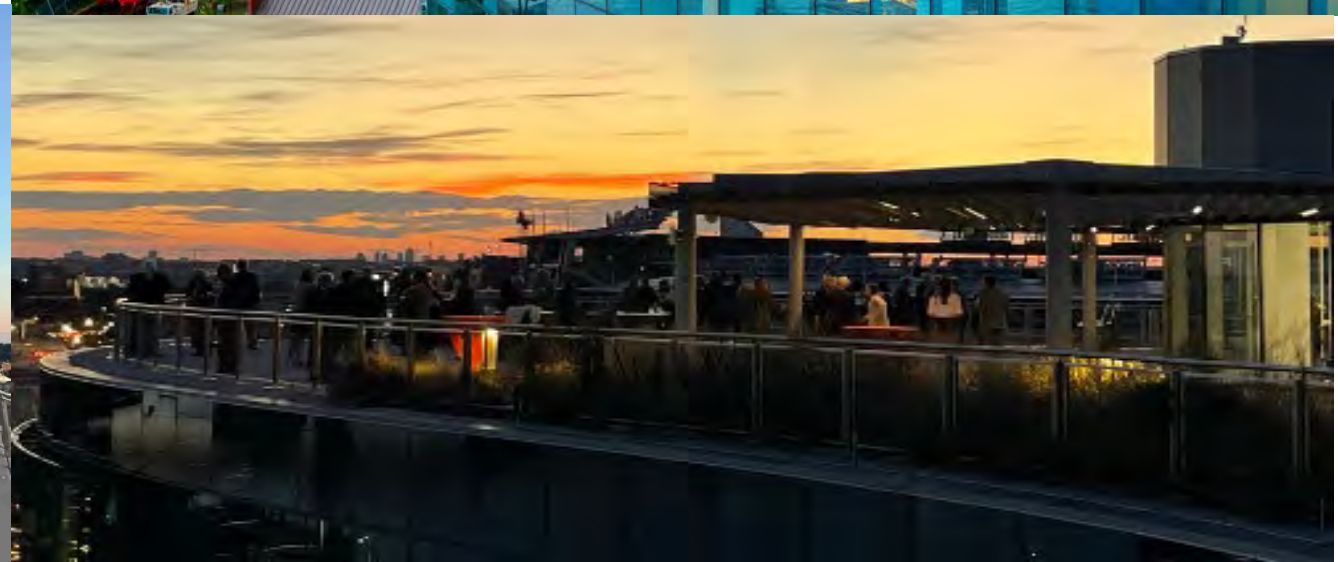


**Unused Reclaimed Rainwater Goes Back into the River (not CSO)**

# Thank You! You've Been a Great Audience



dc **water is life** | INNOVATION  
Discover What's Possible



# *Financing Onsite Water Treatment Systems*



National Blue Ribbon  
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Water Systems



Review today's agenda

# Assessing Costs of Onsite Water Treatment Systems



Katherine Jashinski, P.E.  
City of Austin

Onsite Water Reuse Summit  
April 10th, 2024

Austin  
**WATER**



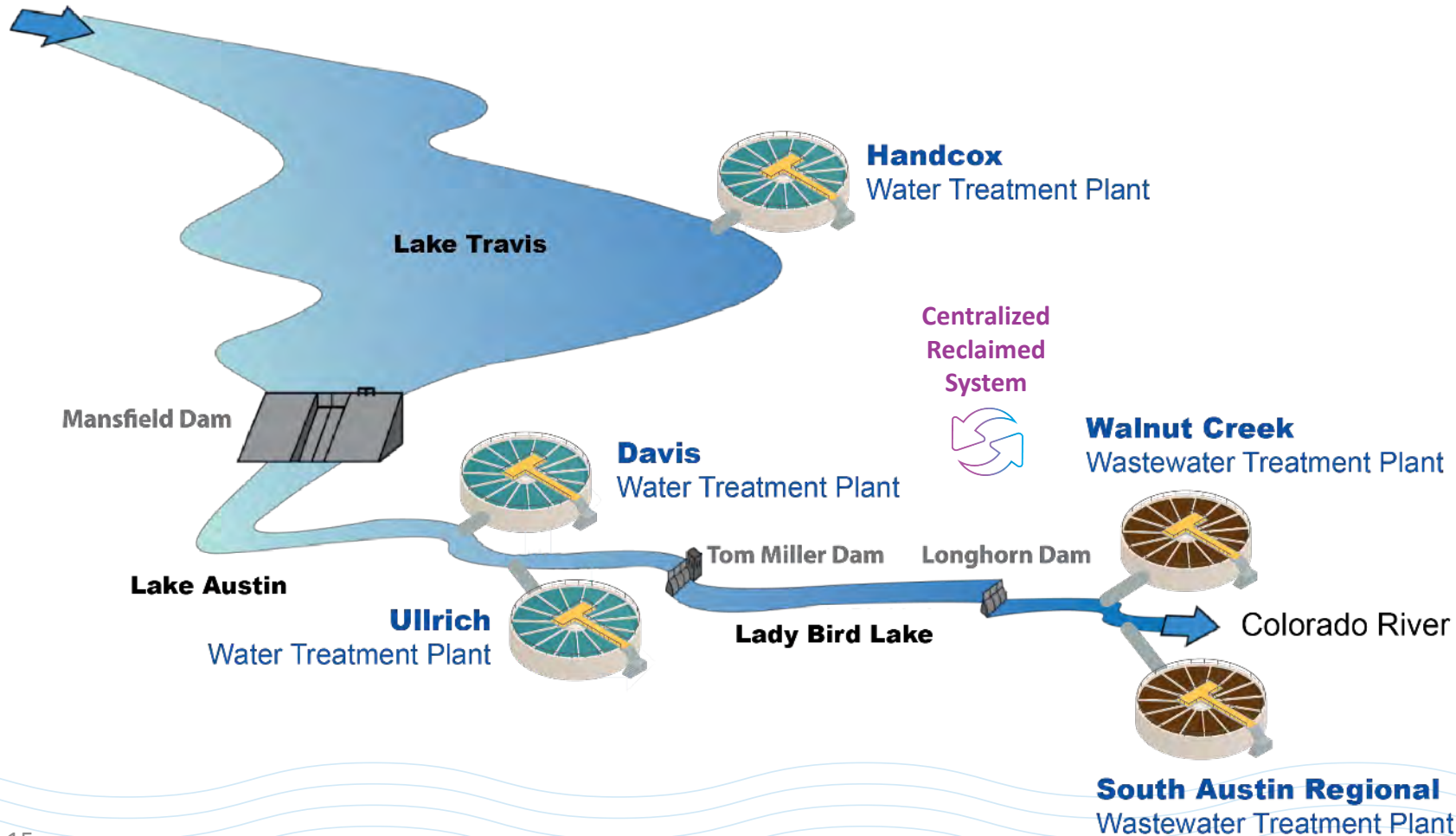
# Austin's Water

## Colorado River + Highland Lakes

### Colorado River:

- Combination of State-granted water rights & long-term contract with LCRA
- Up to 325,000 acre-feet per year (afy)

Lake Buchanan



# WATER FORWARD

## One City One Water One Approach

- **Environmental Sustainability & Climate Equity**
- **Affordability**
- **Reliability & Resiliency**



Reducing Demand	Moving Reuse Forward	Protecting our Core Colorado River Supplies	Building Resiliency
<ul style="list-style-type: none"><li>• Benchmarking</li><li>• Advanced Metering Infrastructure</li><li>• Water Loss Control</li><li>• Conservation Ordinances and Incentives</li></ul>	<ul style="list-style-type: none"><li>• Onsite Reuse</li><li>• Centralized and Decentralized Reclaimed</li></ul>	<ul style="list-style-type: none"><li>• Working with our Regional Partners</li></ul>	<ul style="list-style-type: none"><li>• Aquifer Storage and Recovery</li><li>• Indirect Potable Reuse</li></ul>

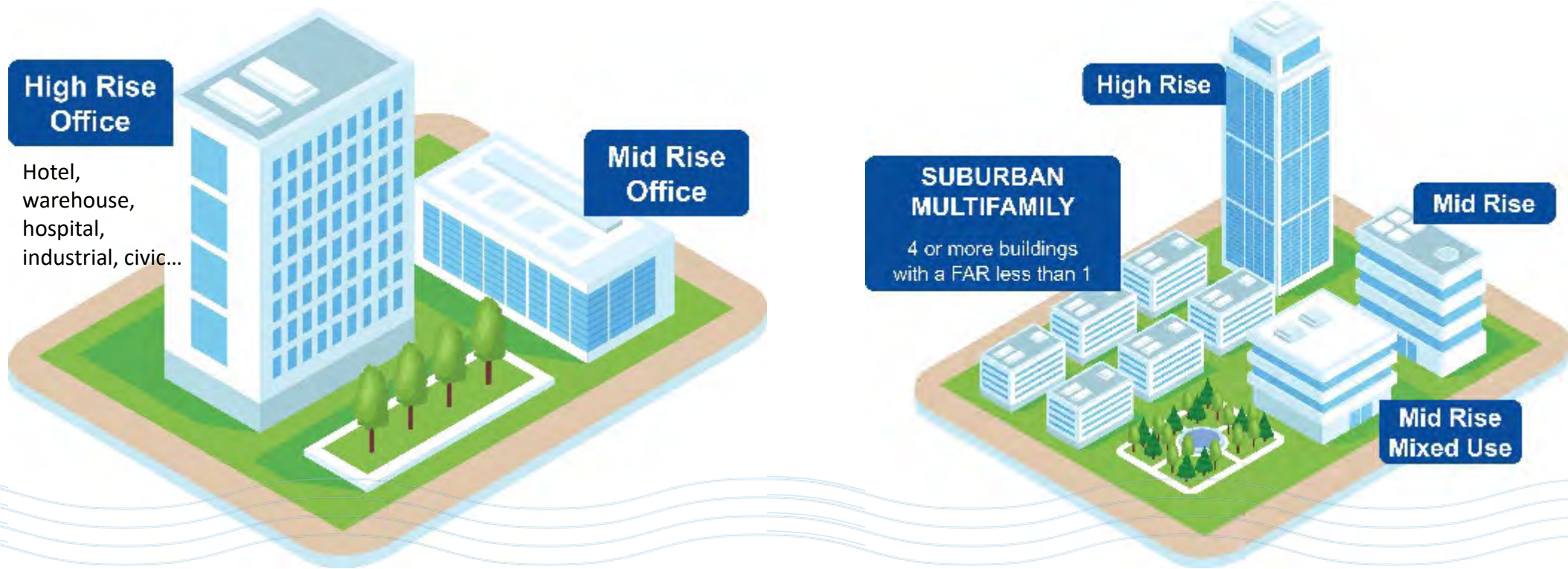
# Water Forward 2040 Targets and Costs

Water Management Strategy		2040 Target in AFY	2040 Target in MGD	Annual Community Unit Cost per AF of Savings
Alternative Water Ordinances and Incentives	Lot Scale Stormwater Harvesting	330	0.29	\$5,510-\$5,062
	Lot Scale Rainwater Harvesting	1,550	1.38	\$2,619-\$2,960
	Lot Scale Graywater Harvesting	2,130	1.90	\$3,898-\$10,666
	Building Scale Wastewater Reuse	1,320	1.18	\$12,692
	Air Conditioning Condensate Reuse	1,080	0.96	\$2,702
	<b>Total</b>	<b>6,410</b>	<b>5.72</b>	<b>\$2,702-\$12,692</b>
Expanded Reclaimed Water System Connection Requirements		<b>12,000</b>	<b>10.7</b>	<b>\$1,229-\$6,127</b>



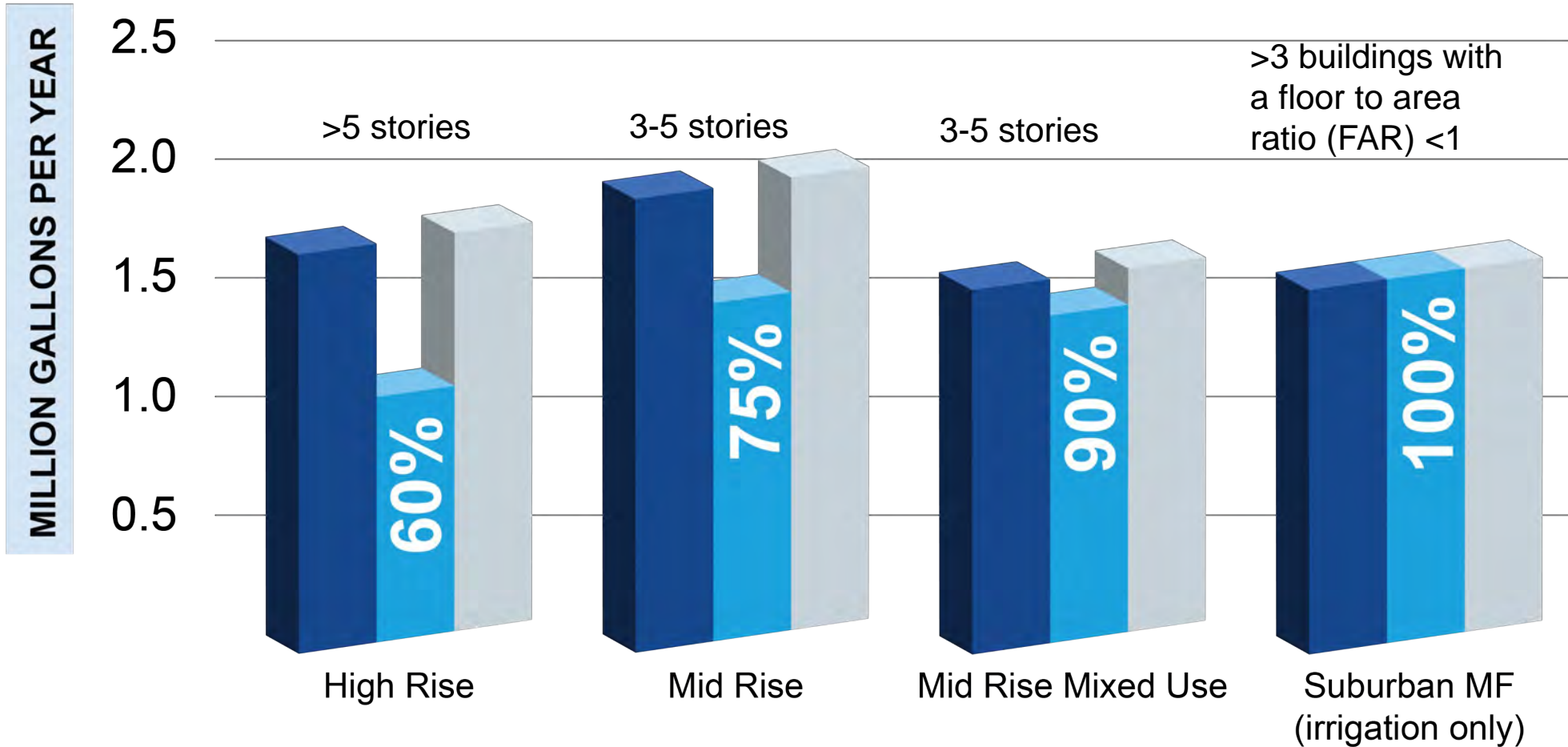
# What is a Large Development Project?

**LARGE DEVELOPMENT PROJECT** means the construction of one or more multi-family, mixed use, or commercial buildings on one or more parcels in accordance with a phased plan or approved site plan, with a total gross floor area for the building(s) of 250,000 square feet or more.





# Potable Water Offsets for Multifamily Residential Typologies



Total non-potable demand



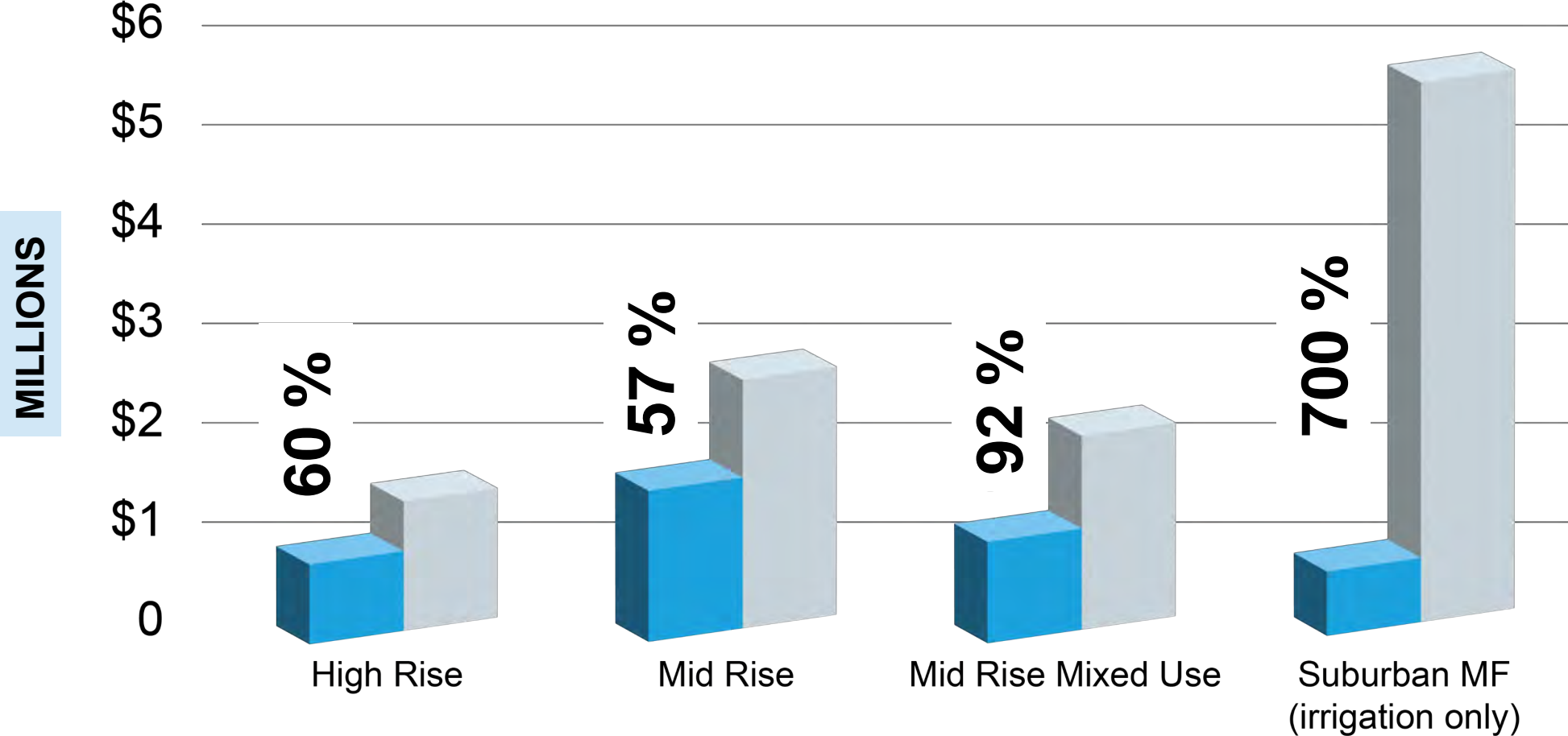
Demand met by RW+AC



Demand met by graywater



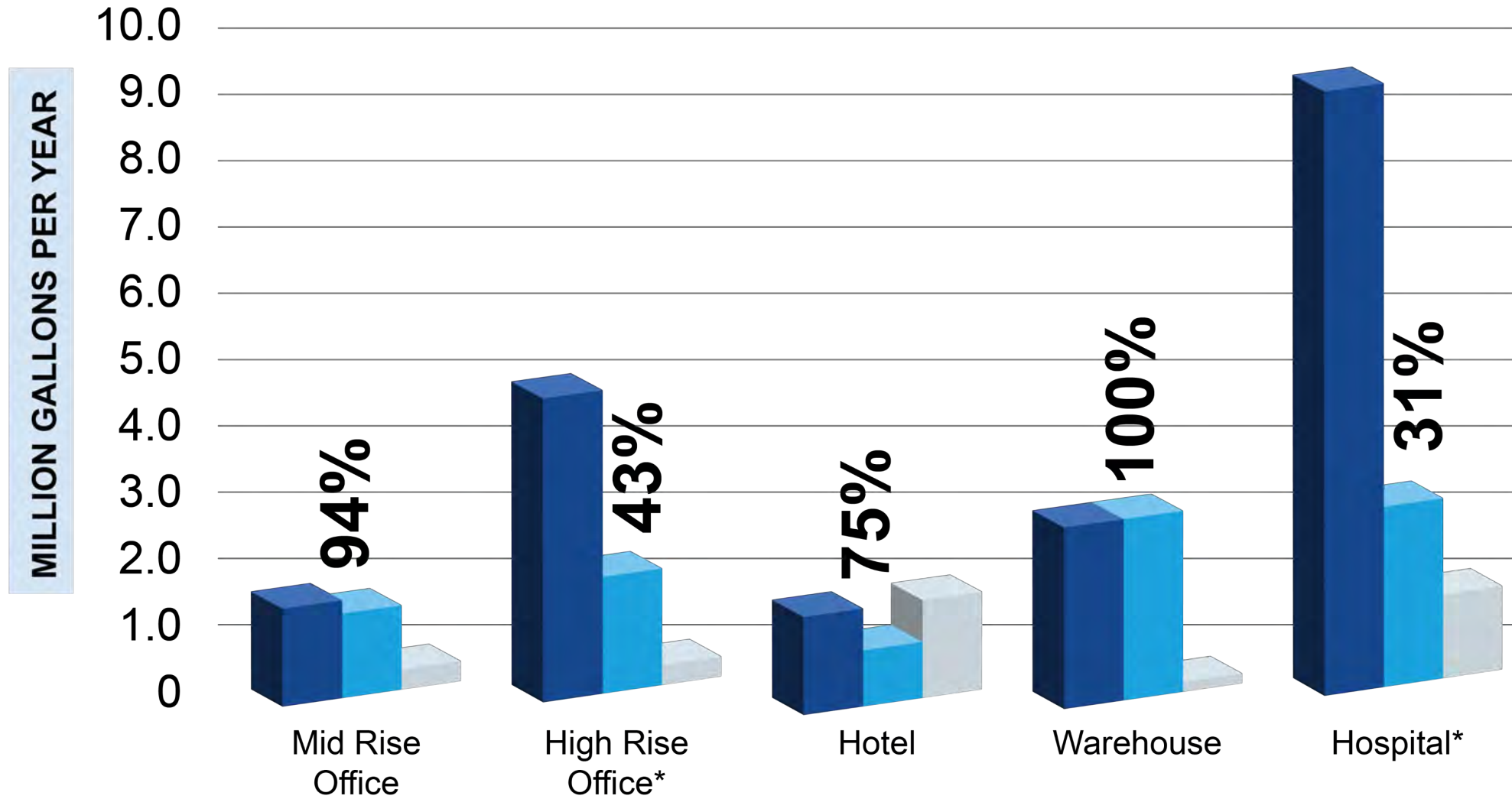
# Capital Costs of OWRS for Large Multifamily Residential Developments



 Demand met by RW+AC       Demand met by graywater



# Potable Water Offsets for Commercial Typologies



Total non-potable demand



Demand met by RW+AC

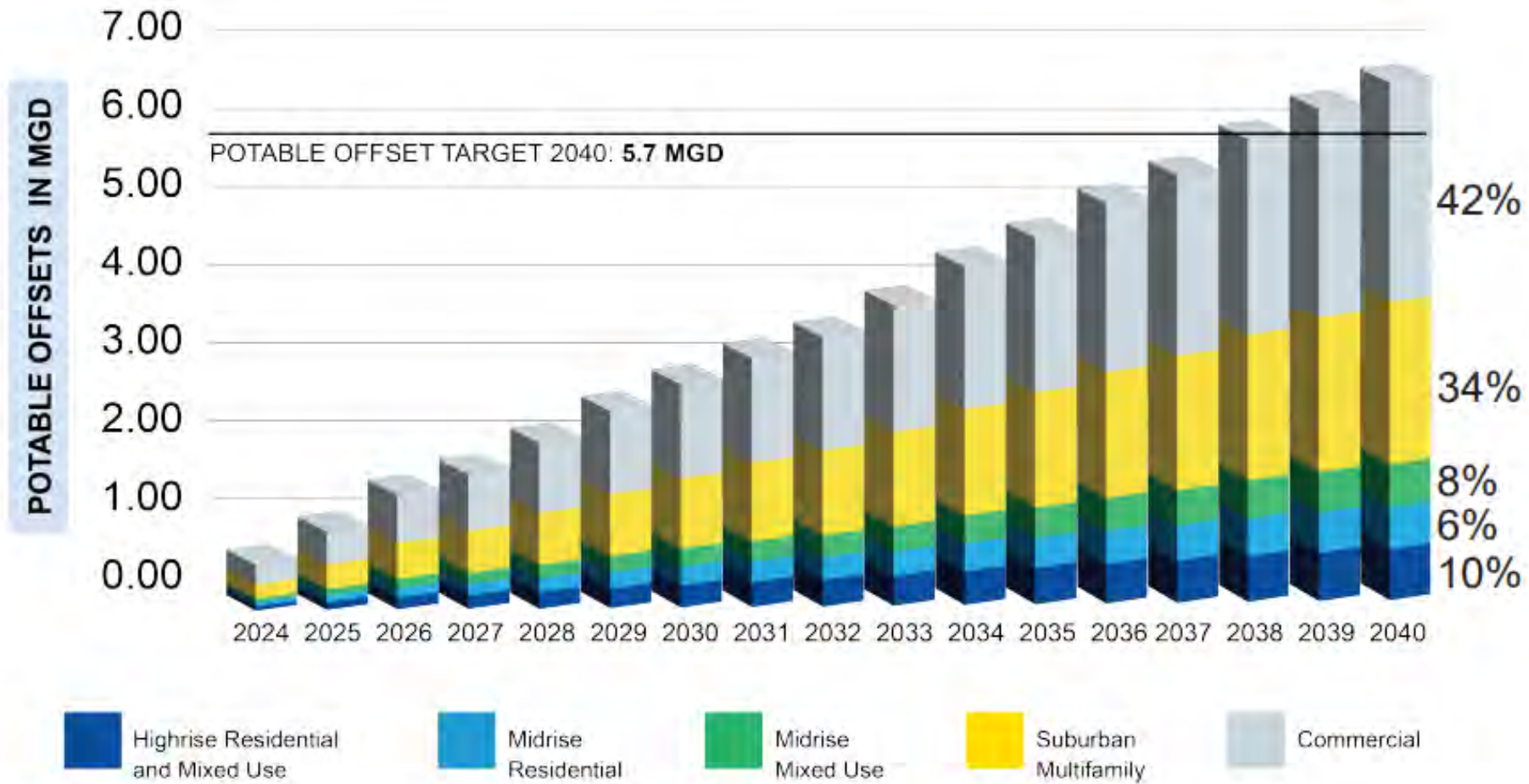


Demand met by graywater

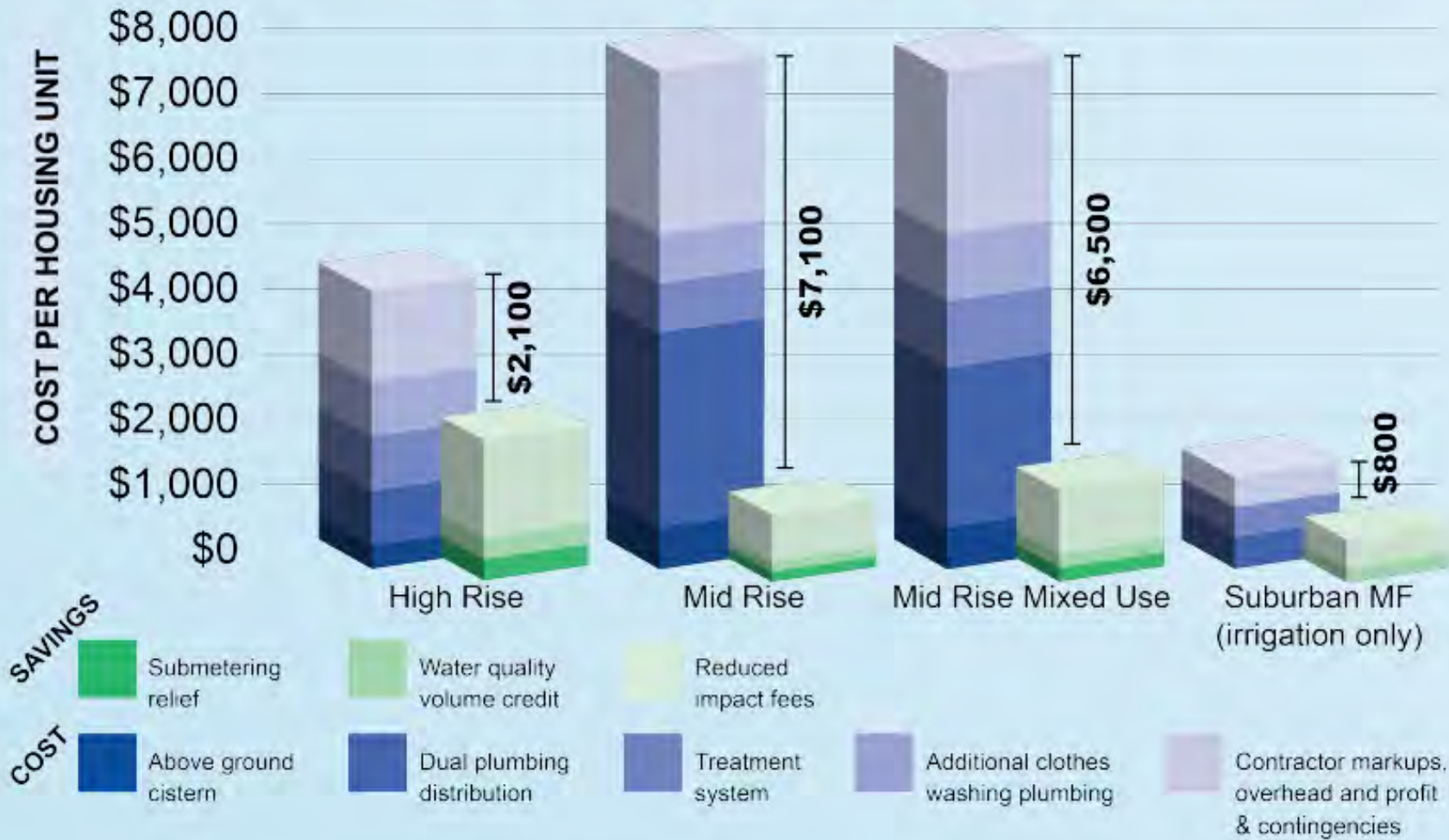


\*Includes a cooling tower

## Cumulative Potable Water Offsets from Onsite Water Reuse



## Capital Costs and Savings for Rainwater + AC Onsite Water Reuse Systems for Residential Building Typologies - Per Housing Unit



# Austin Market-Rate Multifamily Housing

Housing typology	Neighborhood	Built in	Sq ft	Sale price	OWRS added cost	OWRS cost as percentage of sale price
Highrise	Downtown	2019	618	\$550,000	\$2,100	0.38%
Highrise	Downtown	2018	999	\$950,000	\$2,100	0.22%
Highrise	Downtown	2022	3,234	\$4,990,000	\$2,100	0.04%
Midrise	S. Congress	2023	973	\$699,000	\$7,100	1.02%
Midrise	S. Congress	2021	1,225	\$599,950	\$7,100	1.18%
Midrise	S. Congress	2023	811	\$499,000	\$7,100	1.42%

For housing units sold in the \$500K to \$5M range, reuse ordinances can add 0.04% to 1.42% to the cost



High rise



Mid rise mixed use



Mid rise



# Austin Apartment Rental Market

Additional Monthly Cost Per Unit of Housing Using a 30 Year NPV				
	HIGH RISE	MID RISE	MID RISE MIXED USE	SUBURBAN MF
RW+AC	\$8	\$23	\$22	\$3

Typology	Neighborhood	Average Apartment Rent	Added Reclaimed Cost	Added OWRS Cost	% Reclaimed Cost	% OWRS Cost
MF Suburban	Pilot Knob	\$1,554	\$5	\$3	0.32%	0.19%
High Rise	Downtown	\$3,152	\$-1	\$8	-0.03%	0.25%
Mid Rise	South Congress	\$1,985	\$10	\$23	0.50%	1.16%



# OWRS Incentives

Development Type	Pilot Incentives Eligibility	Eligibility for Capacity Charge Adjustments	AW Funded Expedited Building Permit Review	Assistance with PACE Program
<b>Incentive Amount</b>	<b>Up to \$500,000 per project</b>	<b>Up to \$7,528 per year per project</b>	<b>Up to \$36,000 per project</b>	<b>Up to cost of energy/ water efficiency project</b>
<b>Small</b> (Less than 250,000)	Yes, for Voluntary OWRS	Yes, for OWRS that Pass Annual Inspections	Yes	Yes
<b>Large</b> (≥250,000 square feet) without multifamily component	Yes, if meets program criteria for Above and Beyond Project	Yes, for OWRS that Pass Annual Inspections	Yes	Yes





# Funding Strategies

## Advancing Reuse



- ◆ **Community Benefit Charge (CBC)**
  - Add an extra \$0.15 per thousand gallons to AW's CBC to fund reclaimed water system expansion and onsite reuse programs
- ◆ **OWRS Alternative Fee**
  - Large developments greater than 500 feet from centralized reclaimed will install dual plumbing and pay a fee to support reclaimed system expansion in place of implementing OWRS
- ◆ **Purple Choice and Purple Choice Plus**
  - Voluntary rate program for AW residential and commercial customers to fund reclaimed system expansion and programs
- ◆ **Excess Usage Fees**
  - Fees applied when potable water allotments from Water Benchmarking are exceeded

# Financing Onsite Water Reuse

**Onsite Water Reuse Summit**

**Sharlene Leurig**



**TEXAS  
WATER  
TRADE**

# About Texas Water Trade



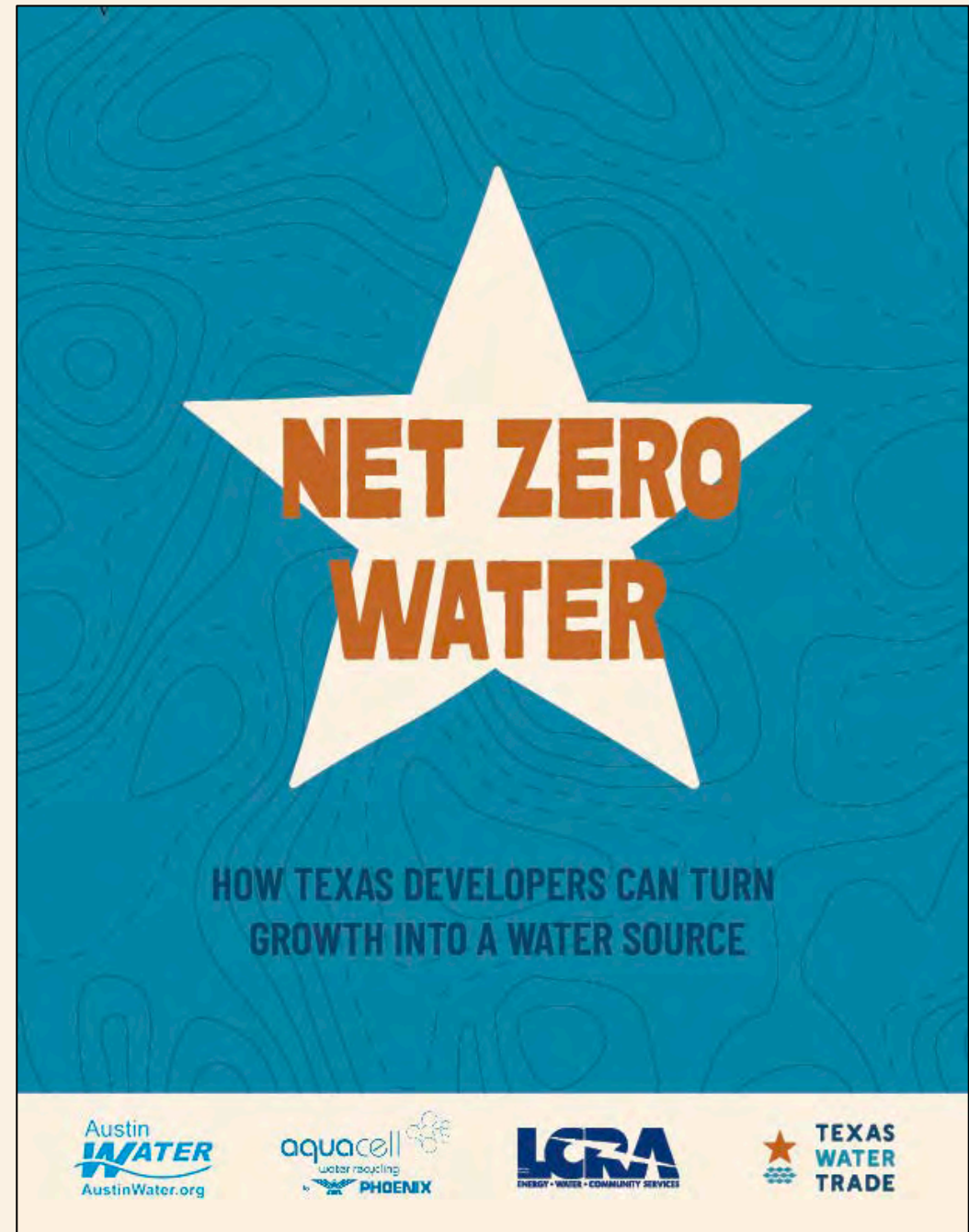
Texas Water Trade (TWT) is a non-profit organization whose mission is to catalyze sustainable water transactions in Texas to ensure clean, flowing water for people and nature.

Our work is focused on developing reliable water access for *all* water users in Texas.

# Out Today!

## Net Zero Water Toolkit

SCAN →

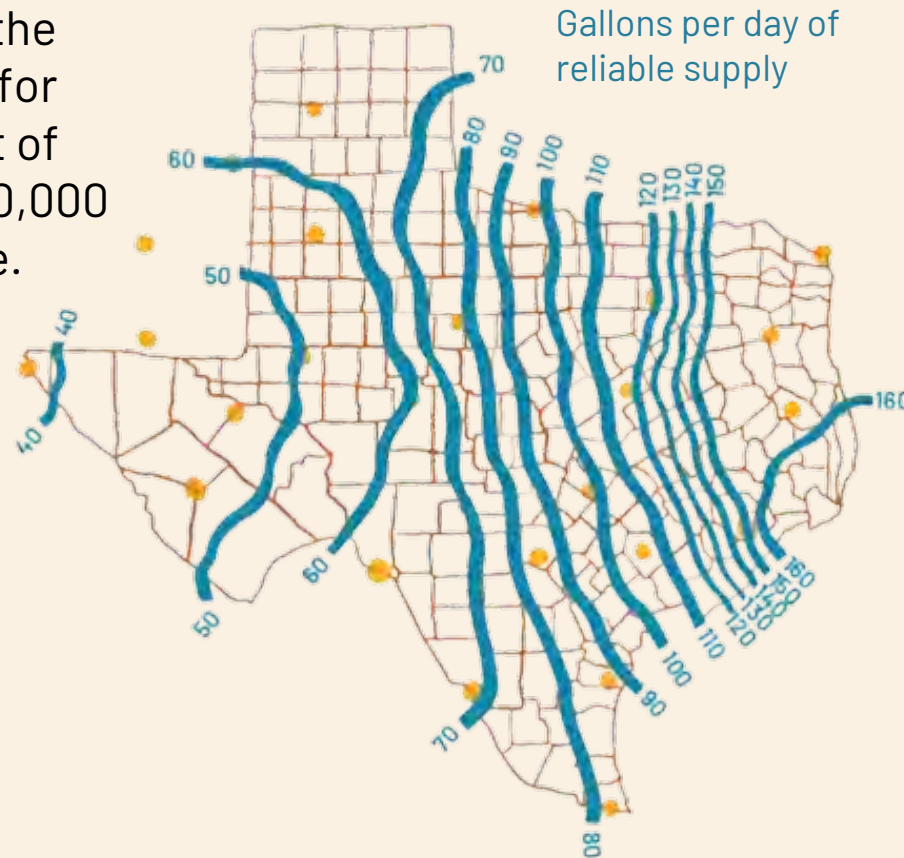


# Yield Potential of Onsite Resources

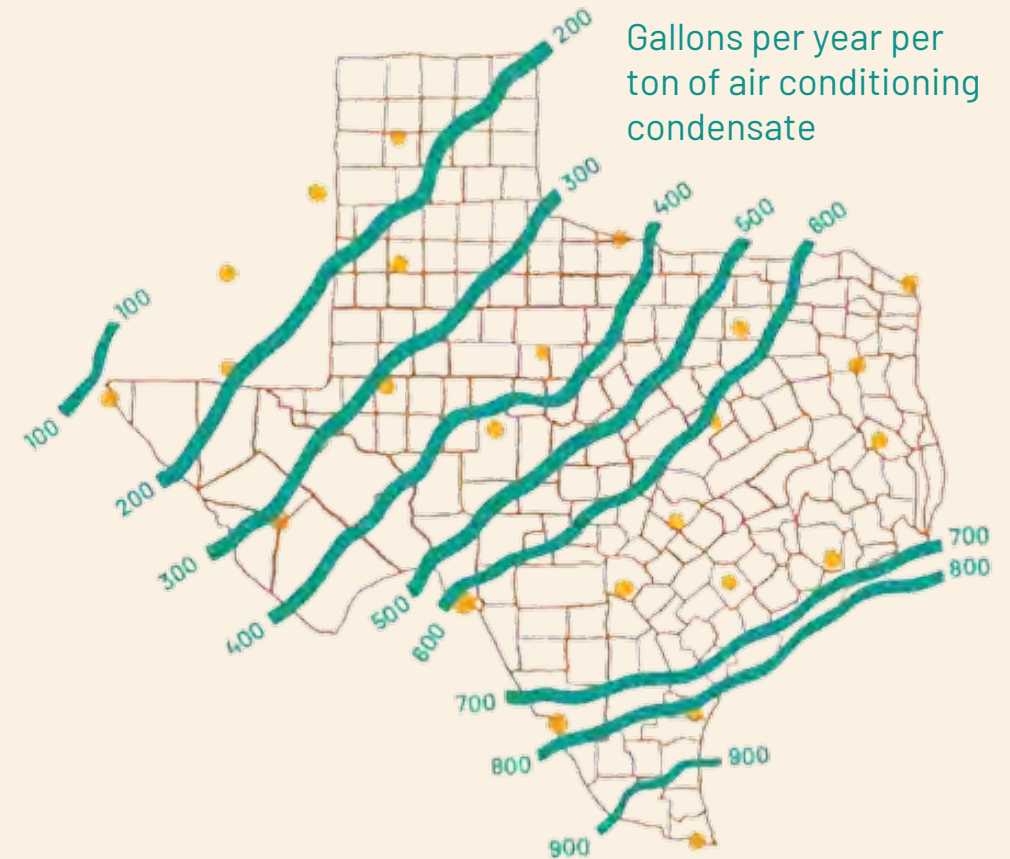
## Reliable Rainwater Harvesting

Firm yields (gallons per day reliable over the period of record) for 3,000 square feet of catchment and 30,000 gallons of storage.

In most cases, larger yields can be attained with more catchment and storage.

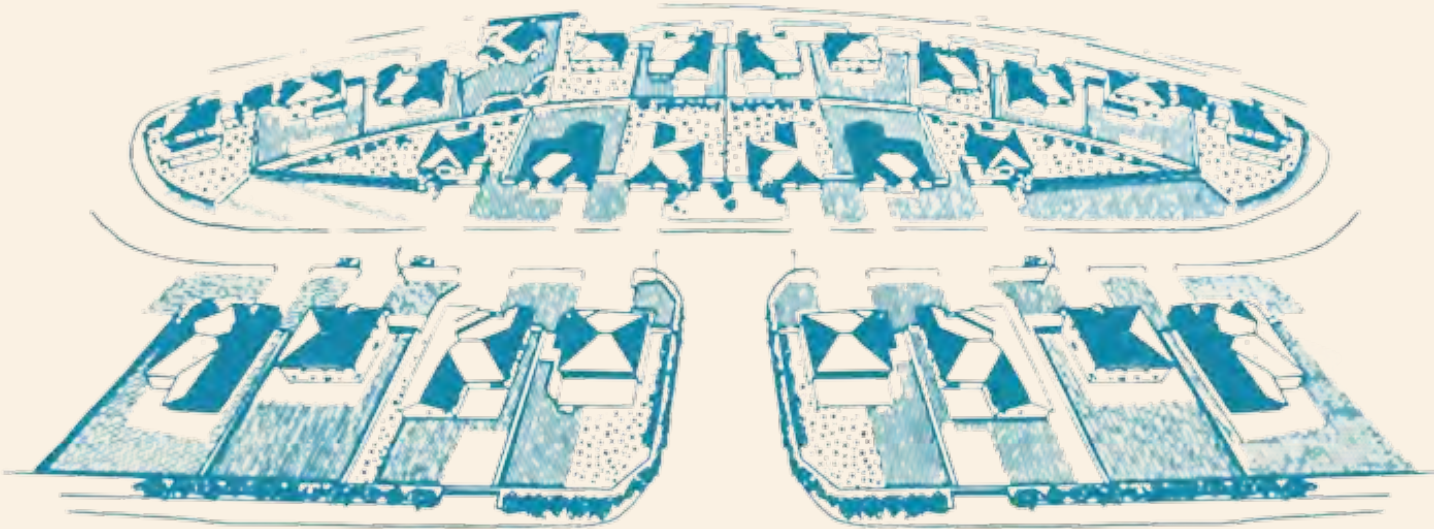


## Condensate Harvesting Potential



# Financing Vehicles

Despite all the benefits that onsite water reuse systems create, there are relatively few projects online in Texas. One of the primary reasons is upfront cost, often borne by developers whose ownership of the site may end within a few years of project delivery.



## *Vehicles Covered in the Toolkit*

**Municipality Utility Districts-MUDs**

**Public Improvement Districts- PIDs**

**Design Build Operate Finance-DBOF**

**Utility Incentives**

**Tax Increment Reinvestment Zones-  
TIRZs**

**Texas Water Fund Programs**

# Suburban and Exurban Growth

- Through the delivery of package plants, one New South Wales development increased its maximum developable lots from 8 to 35.
- Increased density due to onsite water reuse led to an \$11 million increase in profit.
- Wastewater reuse for landscape irrigation on common elements and residential landscapes: An alternative to traditional land application wastewater discharge (which dedicates large acreages to non-marketable uses) and direct discharge permits (which frequently spurs costly litigation over environmental concerns).



**Residential Master Planned Community, New South Wales, Australia**

*(Master Planned Community- Single Family)(Outside Texas)*

# Master Planned Communities- Mixed Use

- The redesign will include 1700 housing units (200 affordable), 200 hotel rooms, 140,000 sq-ft of retail and 1.26 million sq-ft of commercial office space.
- The plan will transform 21 acres of parking into 13 acres of open space.
- Brodie Oaks will capture all rooftop rainwater for beneficial use, including landscape irrigation and cooling towers.
- Rainwater and stormwater reuse systems allowed the project to free up 6 additional acres for negotiated permissible uses while cutting runoff by 2/3.



**Brodie Oaks, Austin**

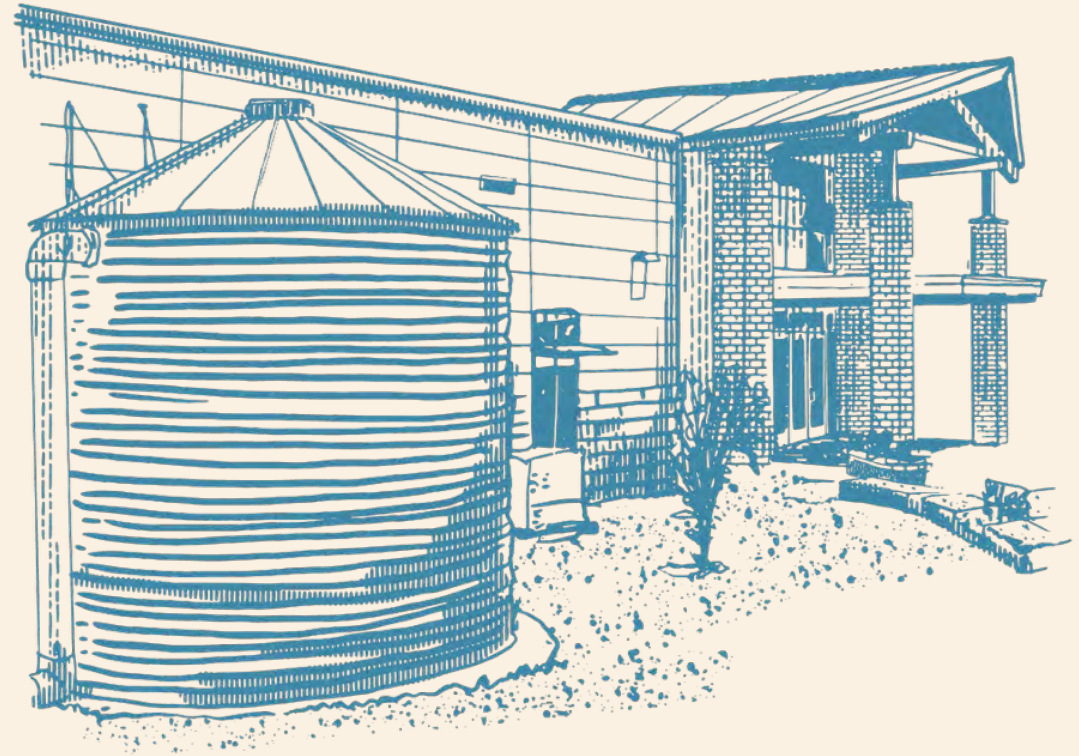
*(Master Planned Community-Mixed Use)*



# Institutional

## Blue Hole Primary School, Wimberly (Institutional)

- System designed to contribute 2,800 gallons per week for non-potable needs during AC operation.
- Utilizes UV-treated effluent for subsurface drip irrigation, including a 1.27-acre athletic field behind the school.
- Average daily wastewater flow: <5,000 gallons
- Average daily interior non-potable water demand: 2,280 gallons (2.85 gallons per person)
- Expected annual potable water savings: Projected at 90%
- Actual first-year savings: 554,800 gallons (49.4% less water use than a comparable school)
- Projected 30-year cost savings: \$724,500
- Variance in projected vs real potable water savings the result of lower rainfall and maintenance challenges.



**Thank You!**

