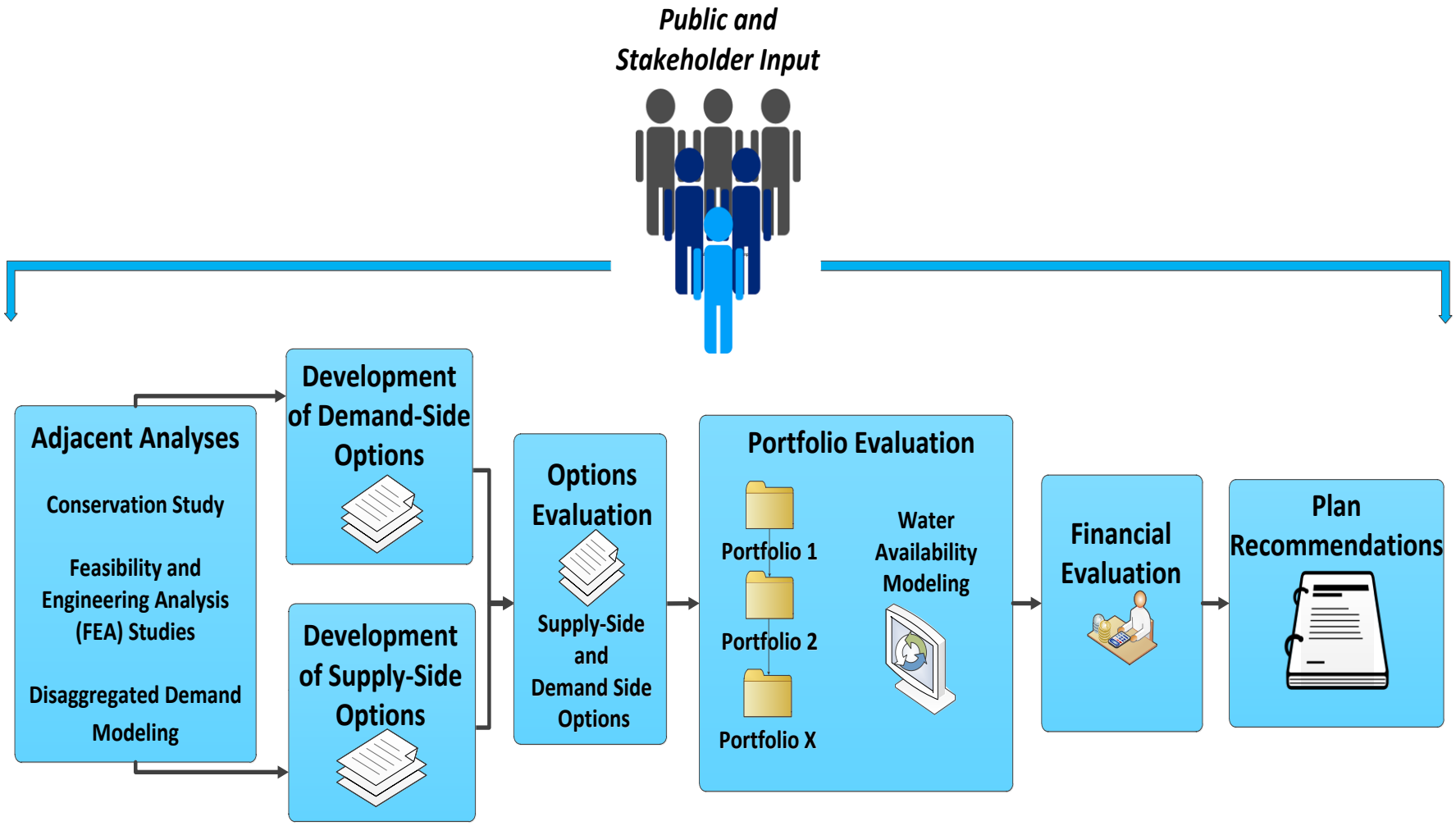
Water Forward
Austin's Integrated Water Resources Plan
Task Force Meeting

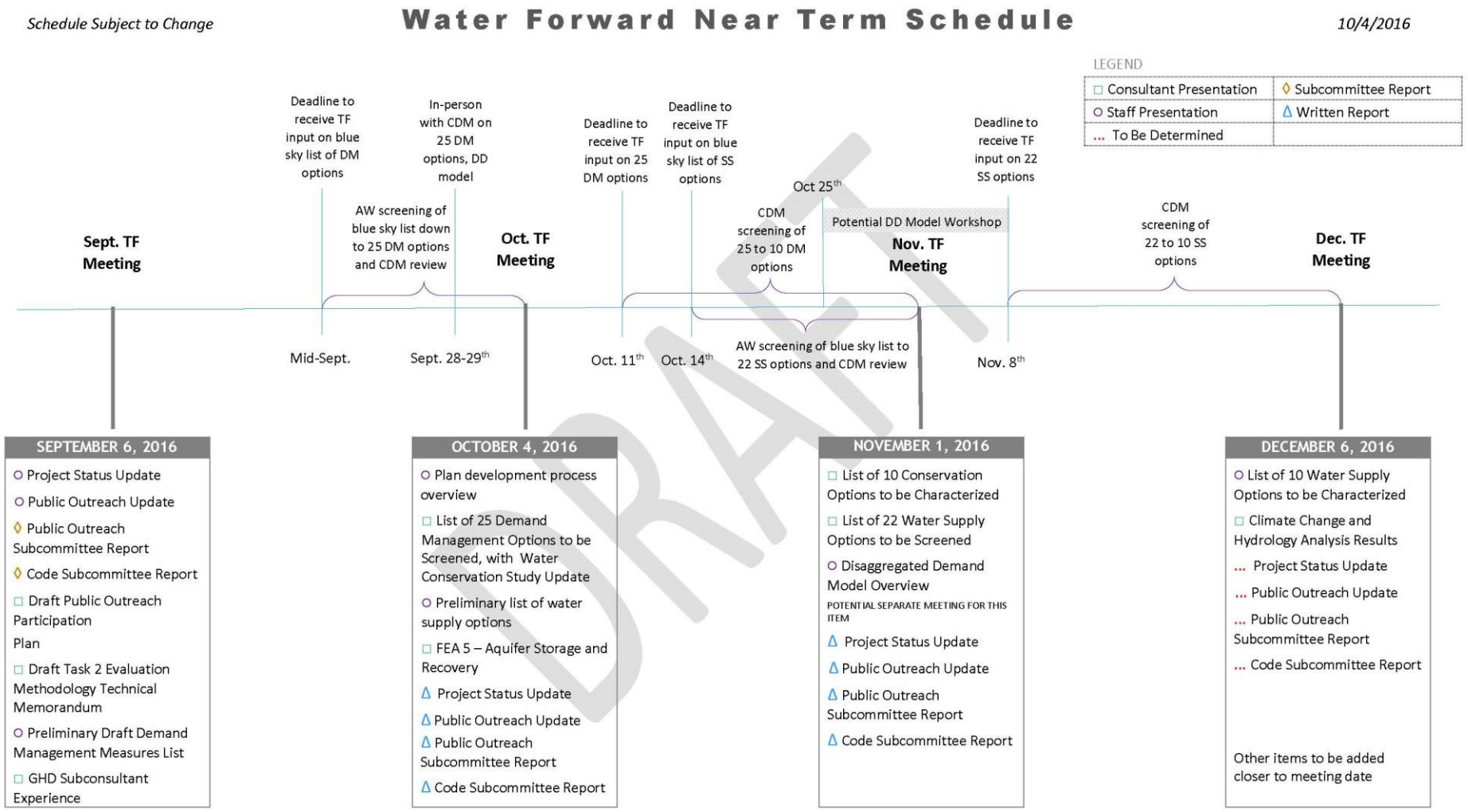
October 4, 2016

Plan Development Process Overview

IWRP Plan Development Process



Water Forward Near-Term Schedule



Questions and Discussion

Draft List of 25 Demand Management Options to be Screened and Water Conservation Study Update

Water Forward
Austin's Integrated Water Resource Plan

Austin Water Demand Management Measures

Peter Mayer, Water DM

Presentation Plan

- Austin Water's current program and context
- Review process for screening the 25 measures to 10 measures
- Draft screening criteria
- 25 water demand management measures proposed for screening
- Looking forward

AW's Current Water Conservation Program

- Inclining block rate structure, monthly billing
- 1-day per week watering restrictions for automatic irrigation systems
- Water loss control
- Commercial and business rebates and audits (various)
- Customer information and education
- Various rebates (Pressure reducing valves (PRVs), rainwater, rainscape, hose timer)
- Pool cover rebates
- Mandatory irrigation audits for commercial properties and free residential audits
- WaterWise Landscape Rebates
- Mandatory efficiency inspections for commercial car washes
- Various other measures

Water Conservation Study (Maddaus, 2015)

Water Conservation Study
Final
September 30, 2015

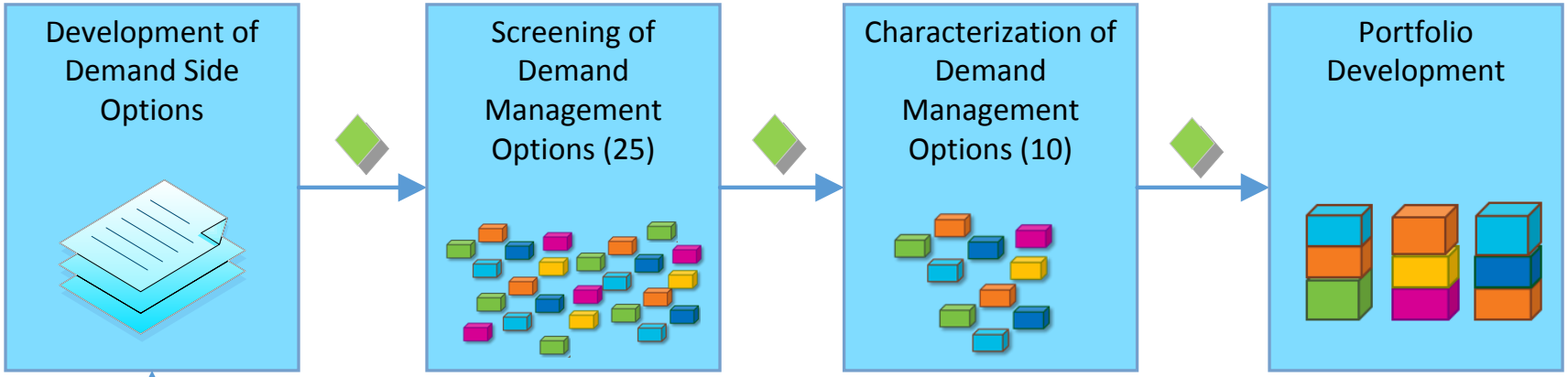
Prepared For:

City of Austin Office of Sustainability & Austin Water Utility

Prepared by:

MADDAUS WATER MANAGEMENT INC.

Demand Management Options Process



Input:
- Austin Water
- Task Force
- Public

Previous Studies/Task Force Efforts:
- Water Conservation Study
- Previous task force reports
- Other conservation studies

Task Force Presentation

Draft Screening Criteria - *Utility Perspective*

- **Savings** = Water Savings
  (1 = low potential; 5 = significant potential)
  Note: Water Savings given double weight in overall scoring

- **Cost** = Relative Expected Cost to Implement Program/Policy
  (1 = significant expense; 5 = minimal)

- **Ability** = Relative Ease to Implement Program/Policy
  (1 = extremely difficult, many hurdles; 5 = easy, no additional staff or resources required)

Draft Screening Criteria - *Customer Perspective*

Unit Cost = Customer Cost of Measure / Program / Policy
(1 = significant expense; 5 = minimal)

25 Conservation Options
11 Categories

- Water loss control – utility side
- Automated Metering Infrastructure (AMI), analytics and alerts
- Landscape transformation ordinances and incentives
- Alternative water ordinances and incentives (for example, rainwater, graywater, and ac condensate)
- Irrigation efficiency ordinances and incentives
- Water rates and fees
- Development-focused water use estimates and benchmarking
- Commercial, Industrial, and Institutional (CII) and non-residential ordinances and incentives
- Plumbing codes and ordinances and fixture incentives
- Reclaimed water ordinances & incentives (centralized purple pipe system)
- Customer education and outreach programs

Looking Forward – 100 year planning
Top Measures

- Water loss control
- AMI, rates, information, and education including AMI enabled alerts
- Landscape transformation measures such as WaterWise rebates – landscapes that can thrive on 1-day per week irrigation
- Pre-development water evaluation
- Cooling tower efficiency standards
- Alternative water supply and reuse
  - Customer Scale (on-site systems)
- Water rates and fees

Looking Forward – Alternative Water Supply

- Utility Scale (regional systems) alternative water supply and reuse to be categorized as supply-side options
- Centralized reclaimed water-related strategies to be considered as supply-side options
- There may be opportunities to combine some measures

Looking Forward
On the Bubble

- Specific irrigation efficiency ordinances and programs
- Specific commercial, industrial and institutional (CII) ordinances and non-residential programs
- Specific plumbing codes and fixture programs
- Swimming pool efficiency

Thank you!

See you in November.

Peter Mayer, P.E.
WaterDM

Questions and Discussion

Preliminary Draft Water Supply Options List Presentation

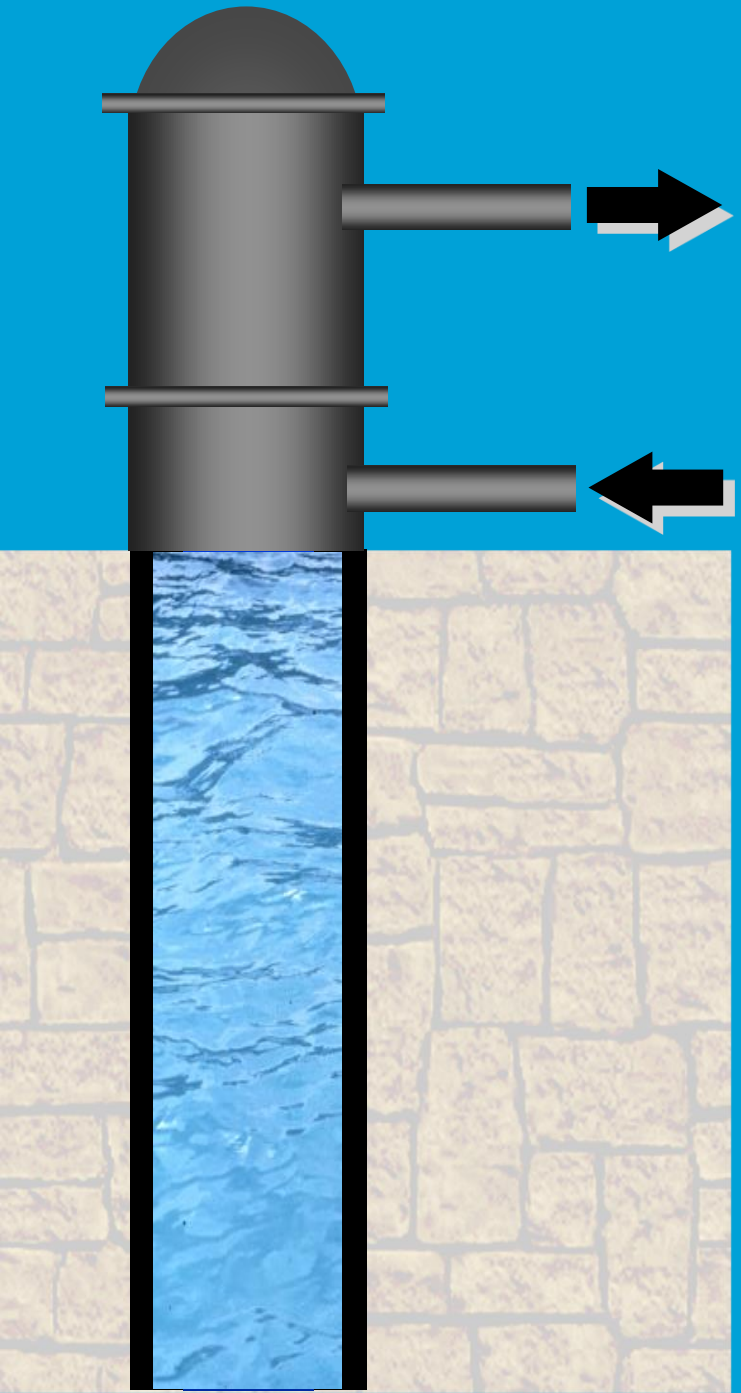
Preliminary Draft Water Supply Options List

- Preliminary draft list provided to consultant team for initial review
  - Included in Task Force member packets
- **Seeking feedback from Task Force on additional water supply options to be considered**
  - Deadline: Friday, October 14th (end of day)
- Seeking public input
  - On-line public comment portal
  - Open October 5th – 14th (end of day)

Preliminary Draft Water Supply Options List

- 22 supply-side options will be identified for initial screening by AW/consultant team
- Screening process will narrow list down to 10 supply-side options for further analysis (options characterization)
- Resulting list of 10 will be used in portfolio development and evaluation process
- Essentially the same process as was used for demand-side options

Questions and Discussion



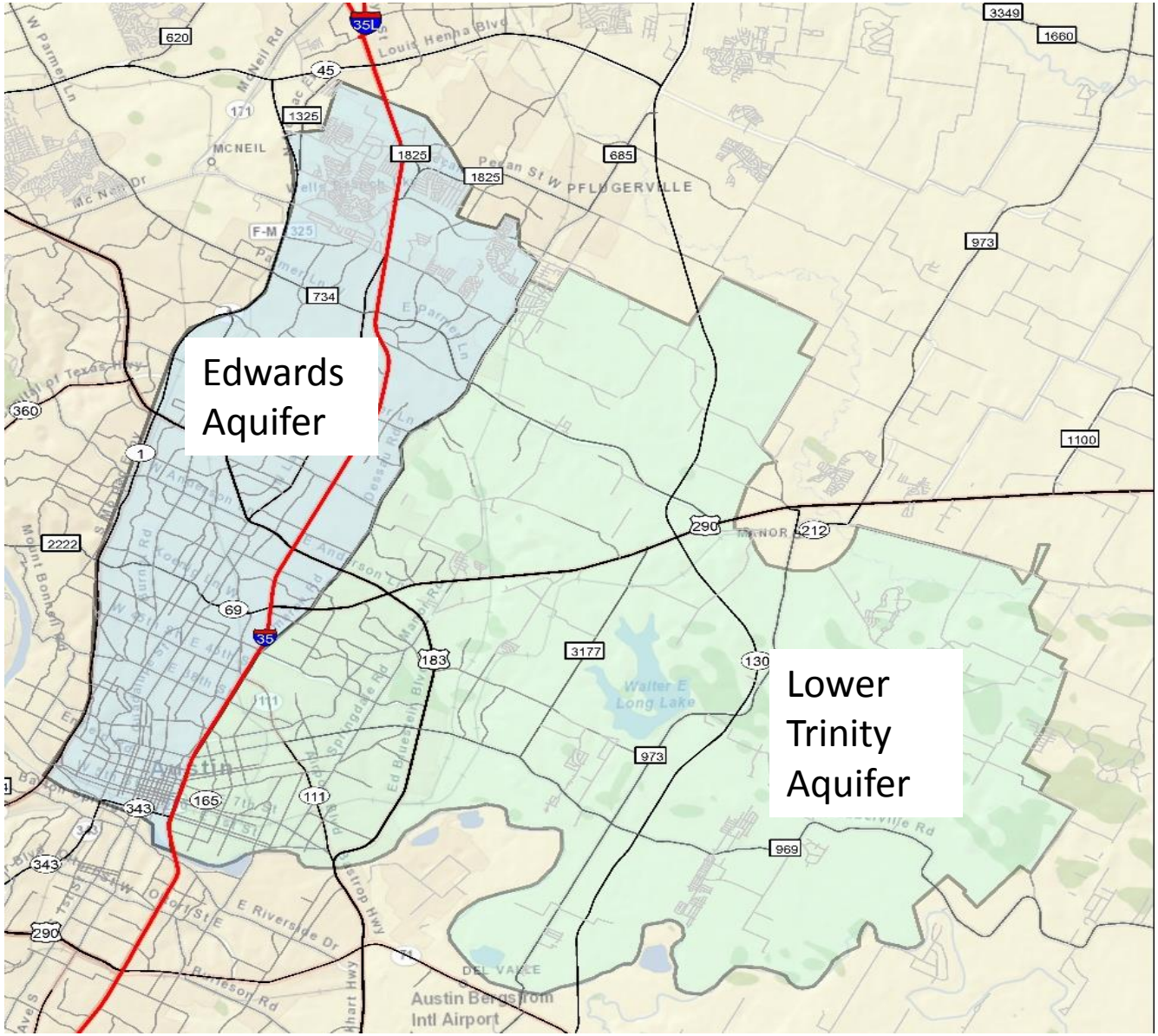
City of Austin Aquifer Storage and Recovery Preliminary Investigation and Feasibility Analysis

October 4, 2016
Presentation to Water Forward Task Force

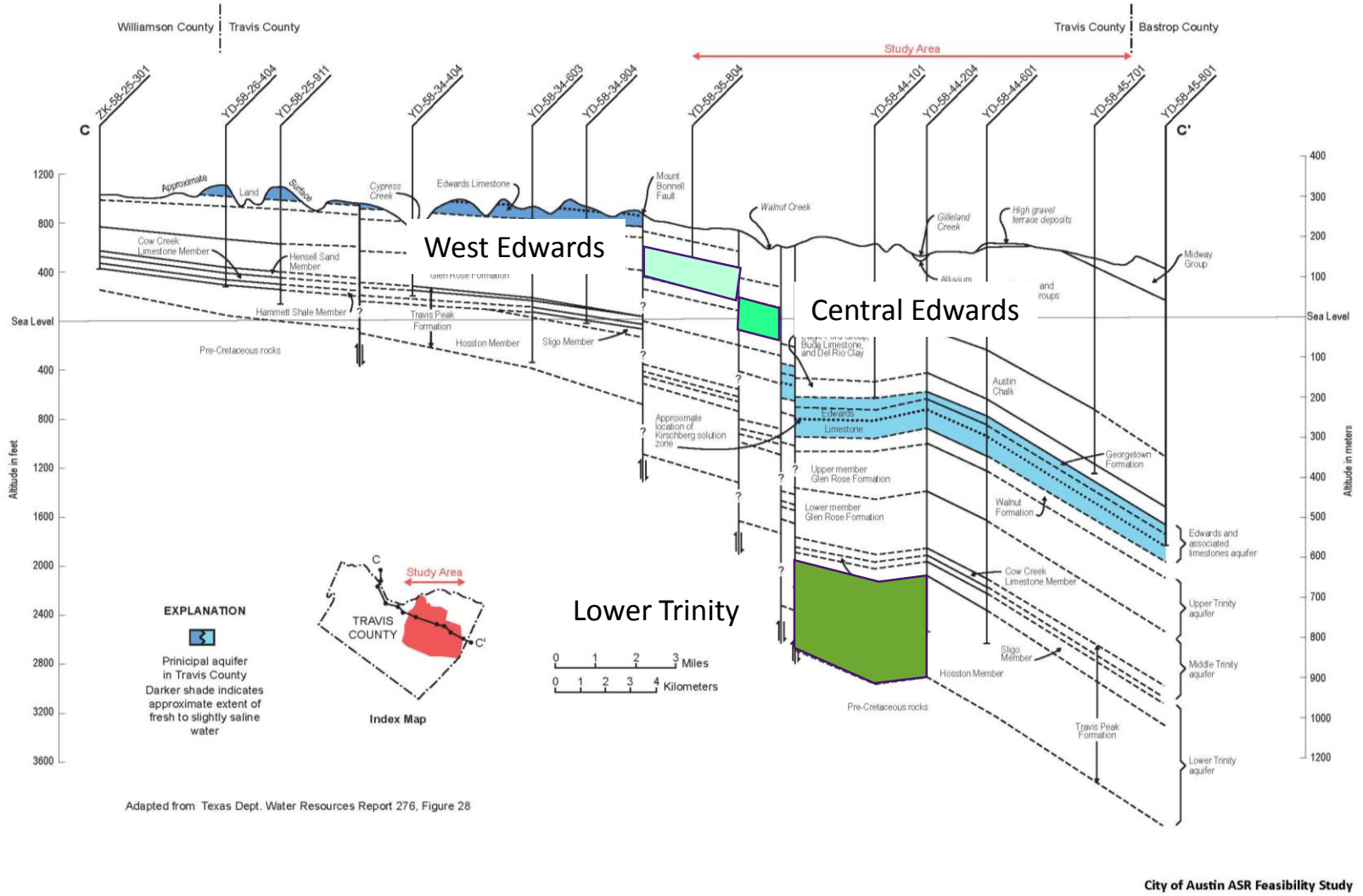
ch2m

Overview

- Scope
- Findings
- Next steps



Regional Cross-Section



Adapted from Texas Dept. Water Resources Report 276, Figure 28

City of Austin ASR Feasibility Study

Scope

- **Source Water Assessment and Strategic Direction** – characterize the quality and general availability of three potential source waters; drinking water, reuse water, and surface water; identify key factors for suitability for recharge
- **Groundwater Assessment** – characterize the hydraulic and water quality of the two storage zones; northern Edwards aquifer and lower Trinity Aquifer; complete a preliminary geochemical analysis
- **ASR Applications and Feasibility** – develop conceptual design for each storage zone and estimate capital and O&M costs (including integration piping), peak recovery rate, total storage capacity, and storage losses
- **Permitting and Regulatory Consideration** – ID regulatory requirements for implementing ASR applications; assess potential for impact to sensitive groundwater receptors
- **Project Implementation and Phasing** – Provide development of phases to implement the full-scale ASR system to include pilot testing and subsequent design and construction phases to reach full-scale
- **Report** – draft and final report preparation
- **PM and Coordination** – includes up to four presentations to stakeholders

Well Layouts

	West Edwards	Central Edwards	Lower Trinity
Well Spacing (ft)	2,500	1,500	1,500
Well Depth (ft bls)	570	940	3,450
Well Recovery Capacity (gpm)	150	730	330
Well Recharge Capacity (gpm)	120	400	115
Number of Wellfields in Study Area	3	4	4
Number of Wells per Field [1]	11	5.5	11
Total Wells	33	22	44

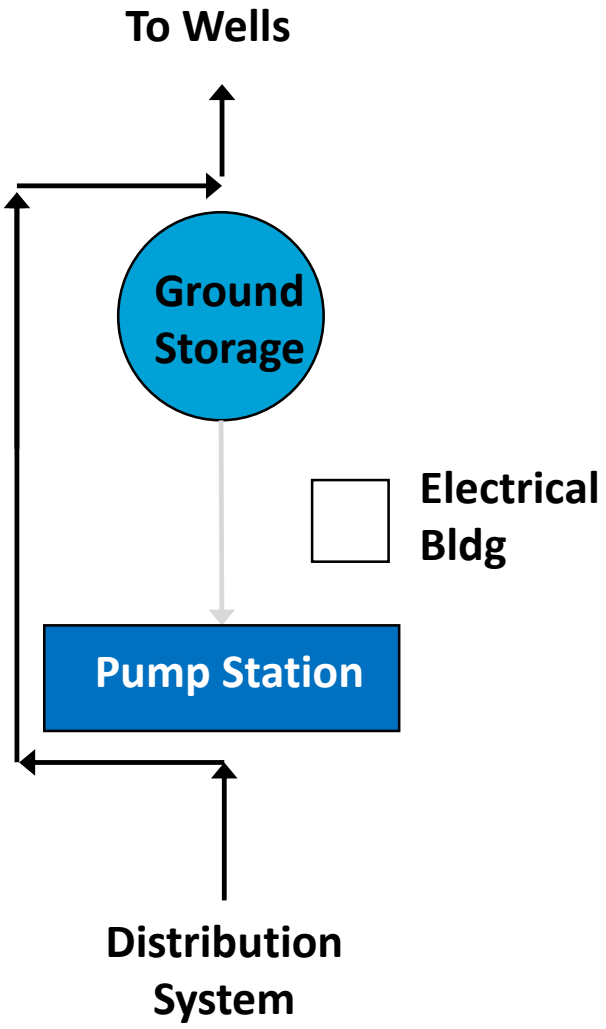
1) Average number of wells per field, includes 10 % standby

Well Recovery Rates

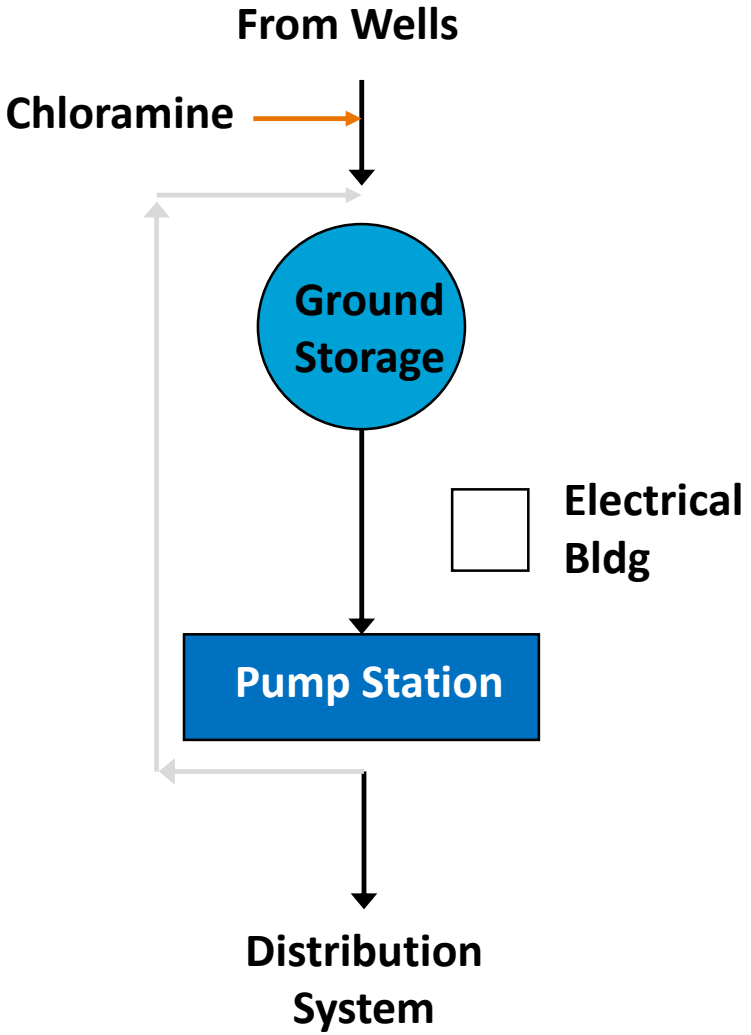
	West Edwards	Central Edwards	Lower Trinity
Study Area Total Recovery Capacity (mgd)	6.5	21.0	19.0
Study Area Total Recharge Capacity (mgd)	5.2	10.7	6.6
3-Yr Study Area Total Target Storage Volume (ac-ft)	21,792	70,703	63,923
Study Area Max Recharge Demand (ac-ft/yr)	5,811	12,912	7,425
Estimated Fill Time (yr)	NA [1]	13.83	9.0
Study Area Annual Maintenance Recharge (ac-ft/yr)	NA [1]	7,664	292
Annual Loss (%)	NA [1]	10.8	0.5

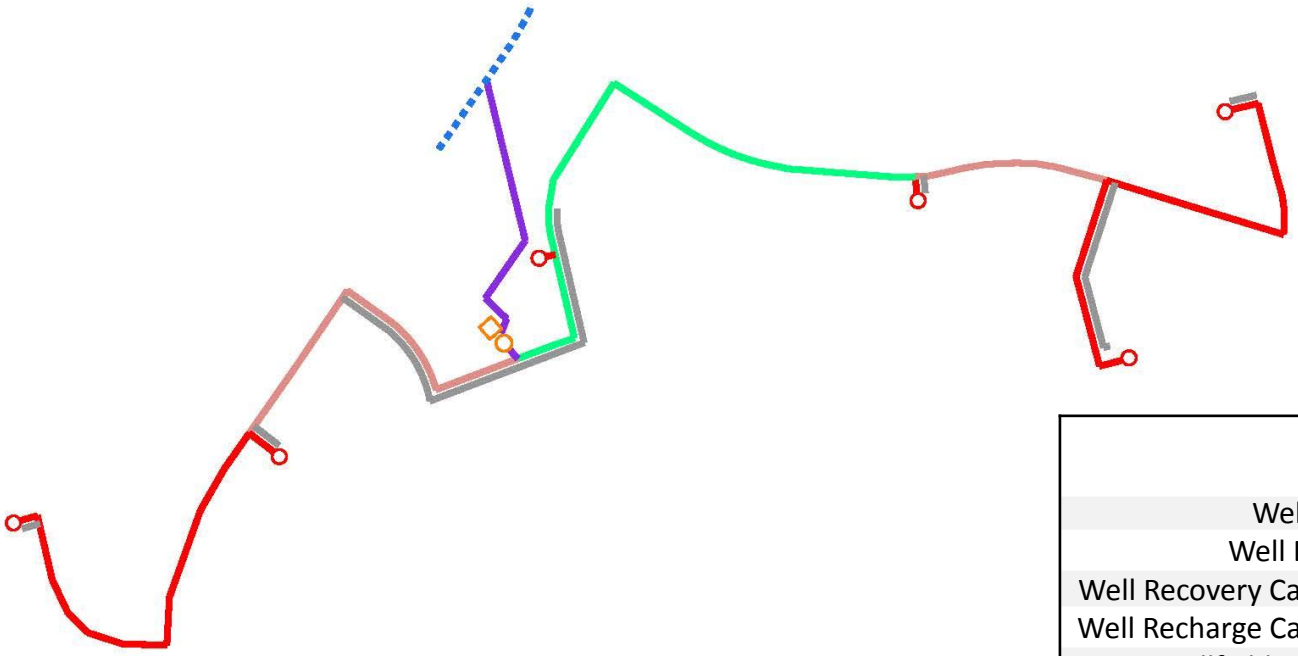
1) Target storage volume cannot be achieved in the West Edwards subarea due to high regional flow velocity

Well Recharge Schematic



Well Recovery Schematic





LEGEND

- 6-INCH WATER MAIN
- 8-INCH WATER MAIN
- 12-INCH WATER MAIN
- 16-INCH WATER MAIN
- 24-INCH WATER MAIN
- EXISTING 30-INCH WATER MAIN
- EXISTING 48-INCH WATER MAIN
- WELL
- PUMPING STATION
- GROUND STORAGE TANK
- ACCESS ROAD

0 500 1000

	Central Edwards
Well Spacing (ft)	1,500
Well Depth (ft bls)	940
Well Recovery Capacity (gpm)	730
Well Recharge Capacity (gpm)	400
Wellfields in Study Area	4
Wells per Field	6

TYPICAL CENTRAL EDWARDS WELLFIELD

CITY OF AUSTIN

ASR PRELIMINARY INVESTIGATION

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PUBLIC PROJECT ENGINEERING
1120 S. Capital of Texas Highway
CityView 2, Suite 100
Austin, Texas 78746
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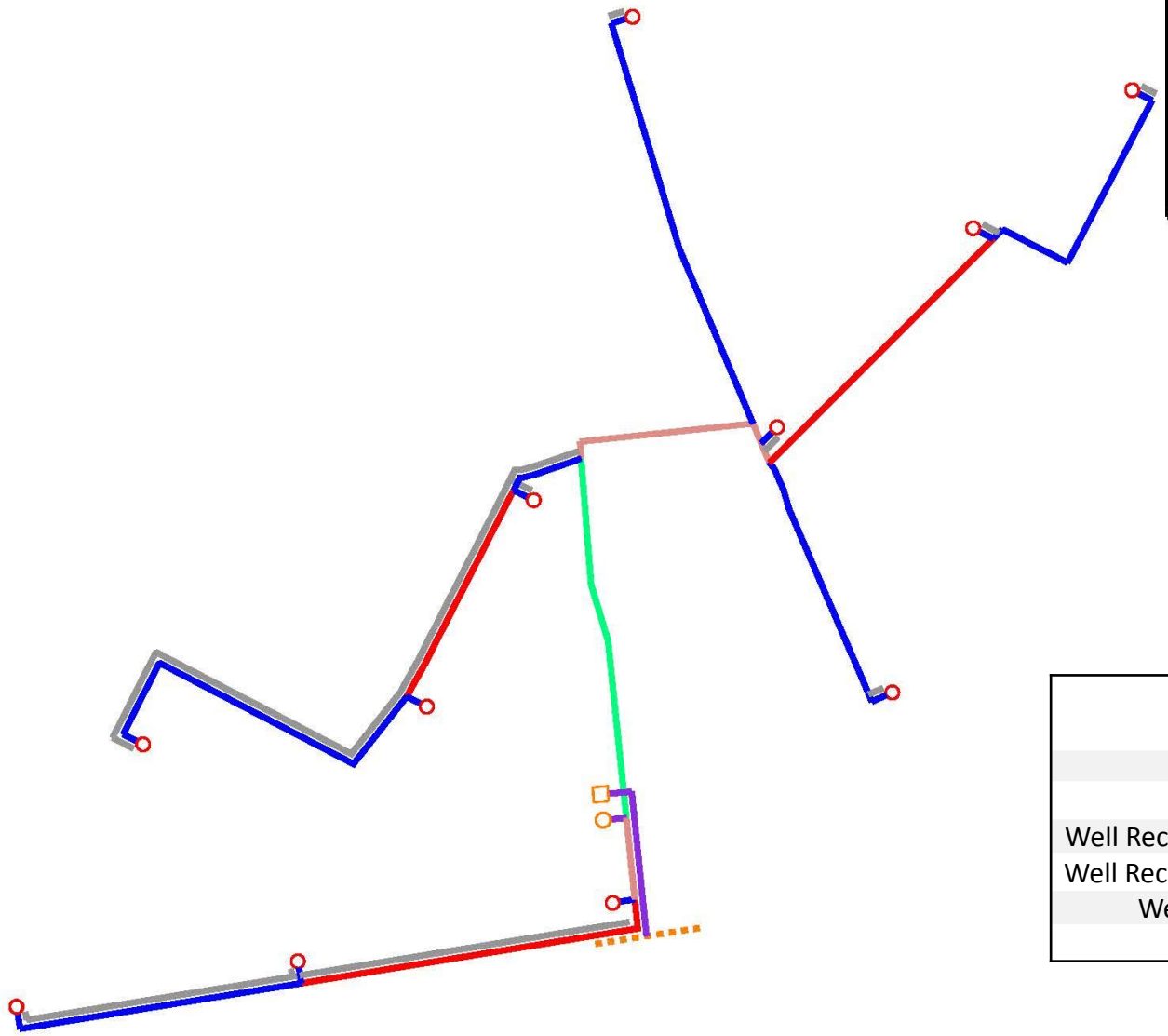
www.kfriese.com



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- WELL
- PUMPING STATION
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- ACCESS ROAD

0 500 1000

	Lower Trinity
Well Spacing (ft)	1,500
Well Depth (ft bls)	3,450
Well Recovery Capacity (gpm)	330
Well Recharge Capacity (gpm)	115
Wellfields in Study Area	4
Wells per Field	11

TYPICAL LOWER TRINITY WELLFIELD

CITY OF AUSTIN

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TBPE Firm Number 6339
www.kfriese.com

Cost Comparison – Planning Level Costs

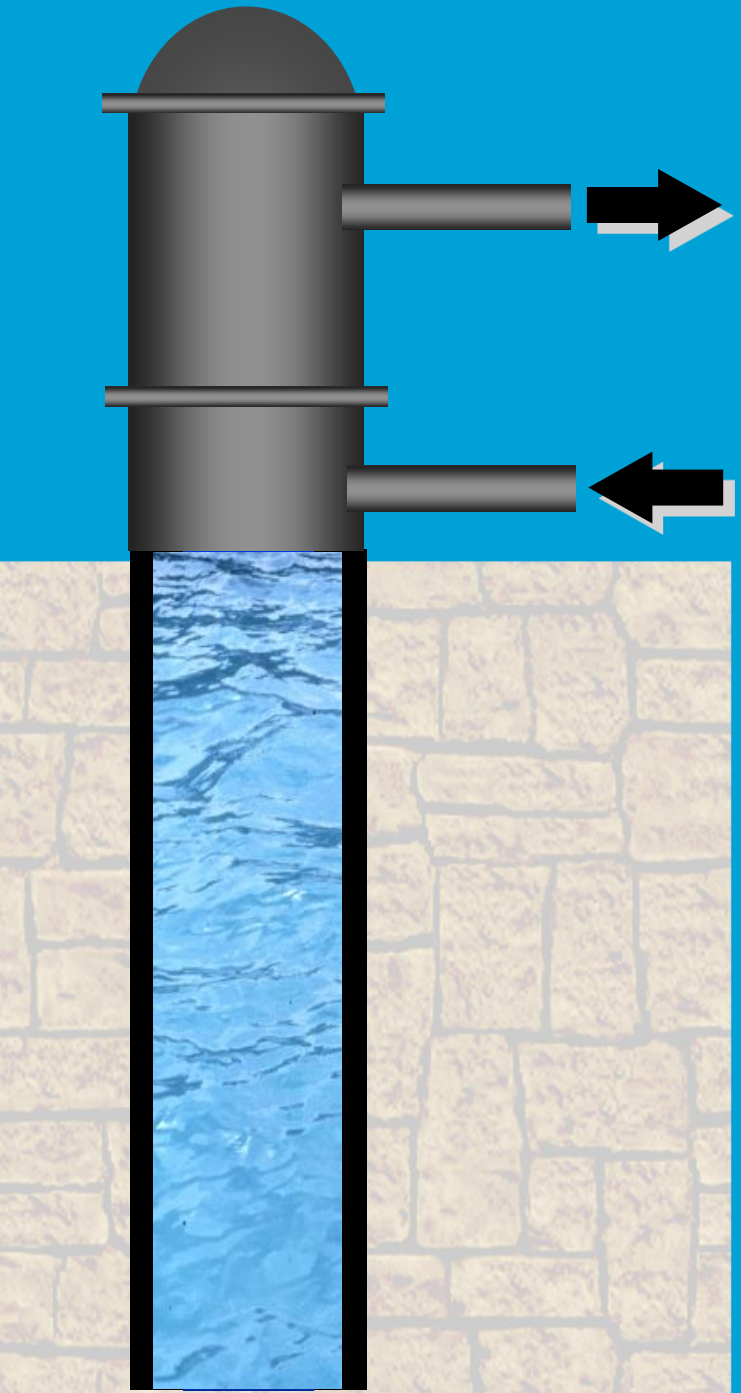
	Central Edwards	Lower Trinity	Notes
Total Cost of Facilities	$53,672,342	$100,703,856	--
Total Implementation Cost (includes cost of facilities)	$83,148,830	$138,749,827	--
O&M Cost	$41,630,207	$40,193,803	--
Total Project Cost	$124,779,037	$178,943,630	2, 3-yr recovery events
Project Yield (ac-ft)	141,406	127,846	30-yr project life
Recovered Water Cost ($ per ac-ft)	$882	$1,400	--

Permitting

- Revised rules issued April 29, 2016
  - streamlines permitting by removing requirements for two-phase project approval by TCEQ
  - eliminates the need to amend existing water rights for projects using appropriated surface water
  - limits the authority of a groundwater conservation district to permit ASR wells to only wells that recover more water than is stored
  - allows storage and recovery of non-drinking water quality waters so long as the associated activities do not cause the native groundwater to become harmful to animals or people or require a higher degree of treatment than is currently required for beneficial use

Next Steps

- Provide comments on potential pilot sites
- Finalize report



Questions

Austin WATER