

Riverbend Water Resources District Regional Water Master Plan



Town Hall Meeting

**Texarkana (Texas) Convention Center
January 31, 2017**

Presentation Outline

- ◆ Project Overview
- ◆ General Observations – Study Area
- ◆ Population Projections
- ◆ Water Demand Projections
- ◆ Regional Water Infrastructure and Alternatives
- ◆ Working Session – Regional Water Infrastructure Discussion
- ◆ Next Steps



Project Participants

- ◆ Riverbend Water Resources District
- ◆ Bowie County
- ◆ Cass County
- ◆ Red River County
- ◆ Central Bowie County WSC*
- ◆ City of Annona
- ◆ City of Atlanta
- ◆ City of Avery
- ◆ City of Clarksville*
- ◆ City of DeKalb
- ◆ City of Hooks



Project Participants (cont.)

- ◆ City of Leary
- ◆ City of Maud
- ◆ City of Nash
- ◆ City of New Boston
- ◆ City of Red Lick*
- ◆ City of Redwater
- ◆ City of Texarkana (Texas)
- ◆ City of Texarkana (Arkansas)*
- ◆ City of Wake Village
- ◆ International Paper Company
- ◆ TexAmericas Center



Scope of Work

- ◆ **Service Area Description – Data Collection**
- ◆ **Population & Water Demand Projections**
 - Quantify population and water demand projections through a data driven process; developed in five-year increments
- ◆ **Water Infrastructure Assessment & Alternatives**
 - Incorporate a more focused evaluation of existing water supplies and infrastructure alternatives available to RWRD
- ◆ **Water Supply Assessment & Alternatives**
 - Provide a detailed evaluation of present and future water supply and needs along with a defensible approach for RWRD moving forward
- ◆ **Water Conservation/Drought Management Plans**
- ◆ **Funding Options**
 - Develop planning roadmap for RWRD that aligns with TWDB Region D and well-positions RWRD for various grants and financing alternatives



Data Collection Activities

- ◆ Participating entities' input about their water and wastewater systems
 - Maps of existing water and wastewater infrastructure
 - Current population and growth projections
 - Monthly, average and max day water demand data
 - Utility development agreements; build-out schedules of future developments
- ◆ Previous planning documents and comprehensive plans for both RWRD and individual entities
 - HDR Engineering (November 2008)
 - CH2M HILL (August 2012, Phases 1-3)
- ◆ High-level condition assessment of the existing Water Treatment Plants: International Paper, Millwood, and New Boston Road WTPs
 - Site Assessments conducted by a multi-discipline team



General Observations – Study Area



SUSAN ROTH
water and wastewater consulting

General Observations of Study Area

- ◆ Surface water is the primary source of supply for all Domestic users, also used by Industries and the Municipalities;
- ◆ Existing water storage reservoirs: Lake Millwood and Lake Wright Patman;
- ◆ Majority of surface water originates from Cypress Creek, Red River and Sulphur River Basins;
- ◆ Raw water treated by 3 WTPs: International Paper (IP), New Boston Road & Millwood;



General Observations of Study Area

- ◆ Groundwater Conservation Districts do not regulate the withdrawal and use of groundwater within Region D;
- ◆ Texarkana (TX & AR) water supplies are co-mingled;
- ◆ Significant legal considerations exist for interstate transfers;
- ◆ Industrial users represent a significant portion of overall water demands; and,
- ◆ Riverbend Water Resources District (RWRD) is the local sponsor for available water supply from Lake Wright Patman.



Population Projections



SUSAN ROTH
water and wastewater consulting

Population Projection Methodology

- ◆ **Goal: Estimate population projections for the Project Participants from 2010 through 2070 in 5-year increments**
- ◆ **Data Sources:**
 1. 2016 TWDB Region D Water Plan
 2. 2021 TWDB Draft Population & Water Demands
 3. 2010 U.S. Census
 4. Texas State Data Center (TSDC)
 5. Rice University – Hobby Center for the Study of TX
 6. Arkansas-Texas Council of Governments
 7. Project Participant Data



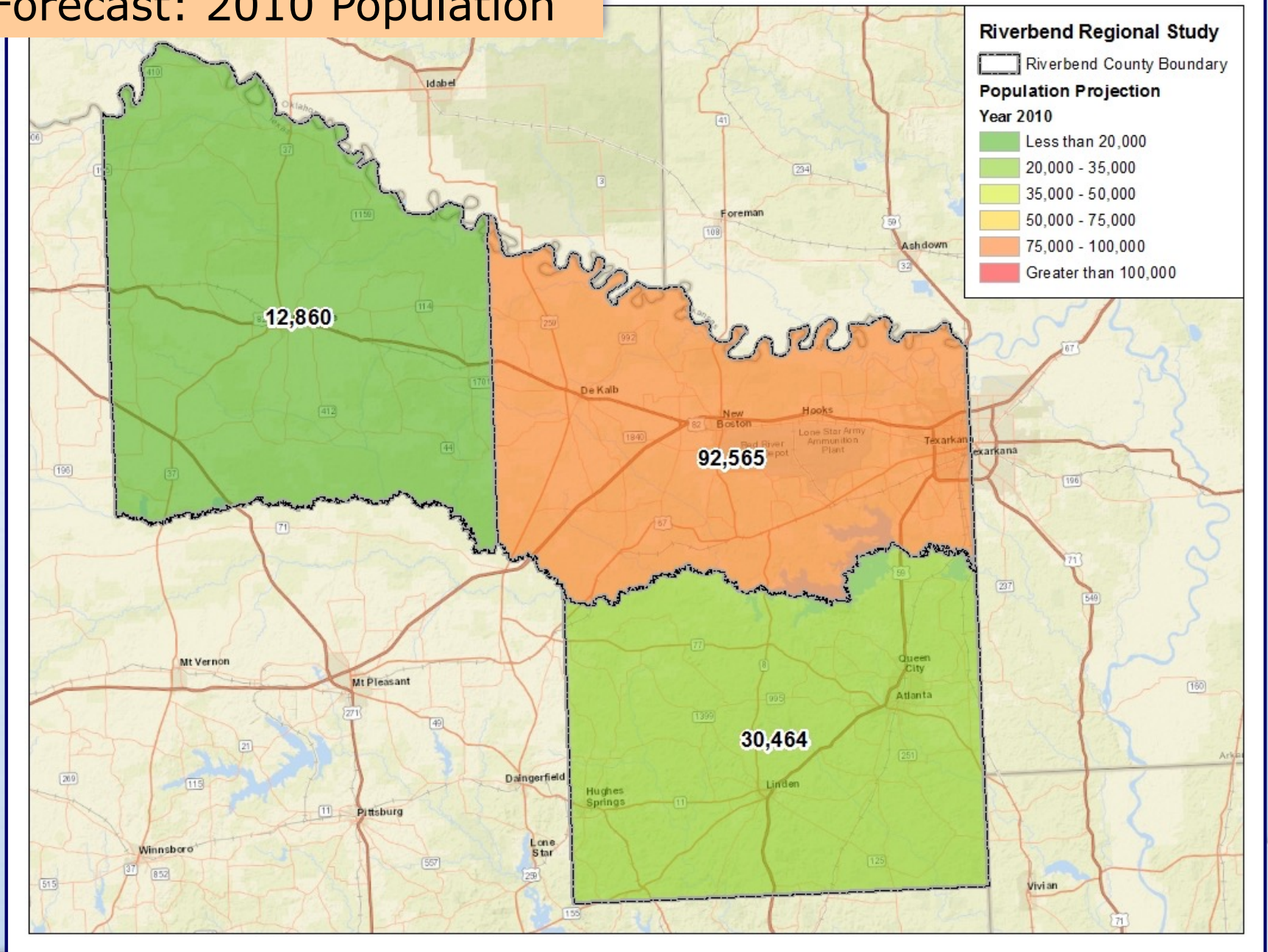
2070 Population Projections

Name of Entity	Entity Data (Pop. & %Annual Growth)*		2016 TWDB (Pop. & %Annual Growth)		TSDC Pop. & %Annual Growth)**	
Central Bowie Co. WSC (Bowie Co.)	13,242	0.91%	7,937	0.64%	6,153	0.21%
City of Atlanta (Cass Co.)	9,709	0.90%	5,818	0.04%	5,918	0.07%
City of Clarksville (Red River Co.)	3,077	-0.10%	3,016	0.02%	2,984	-0.16%
City of Redwater (Bowie Co.)	6,457	3.06%	1,134	0.12%	1,199	0.21%
City of Texarkana (TX) (Bowie Co.)	47,102	0.43%	39,046	0.12%	41,295	0.21%

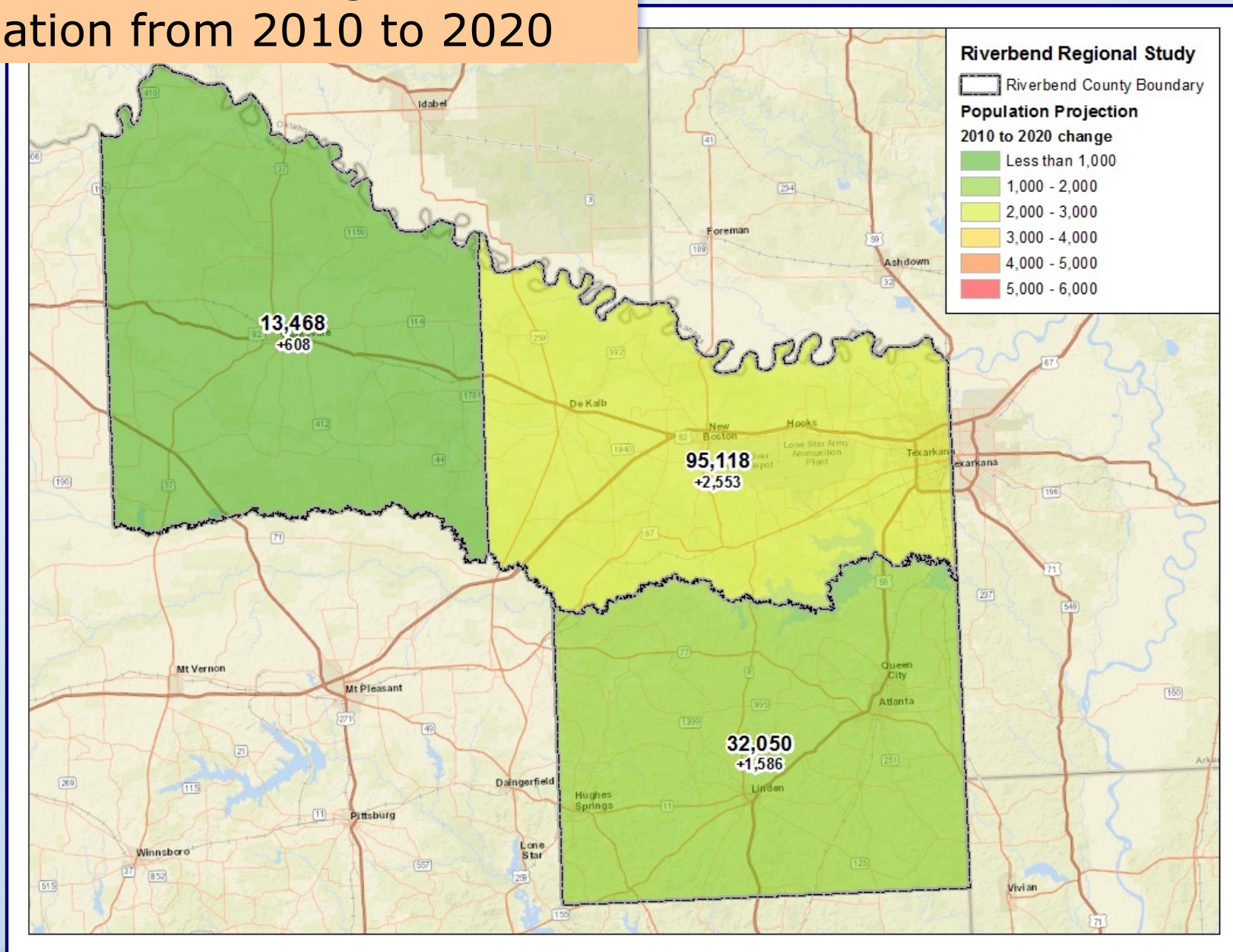
* Data provided by participating entities (draft version)

** TSDC data represents 0.5 Migration Scenario and annual growth rate for County

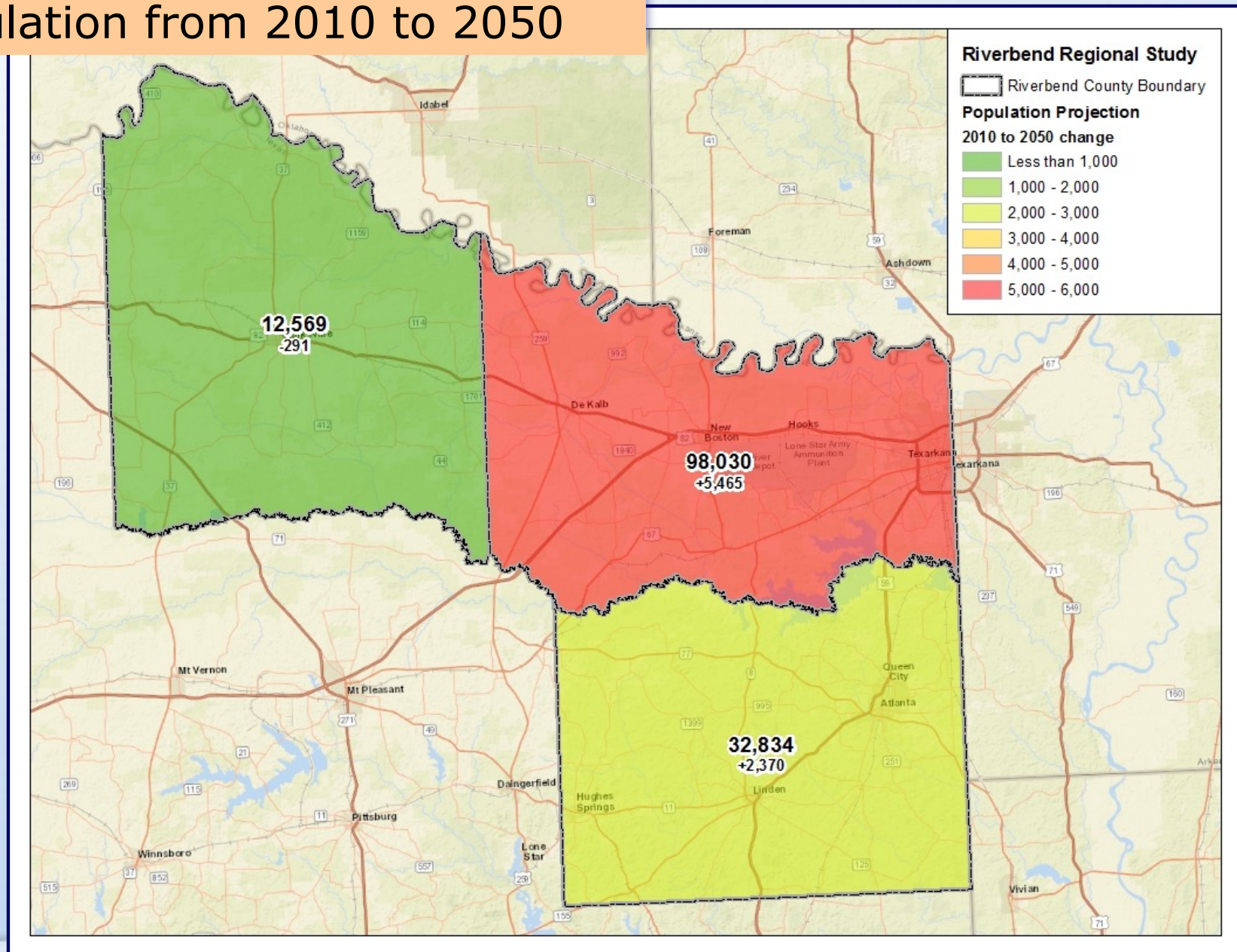
RWRD Counties – U.S. Census Data Forecast: 2010 Population



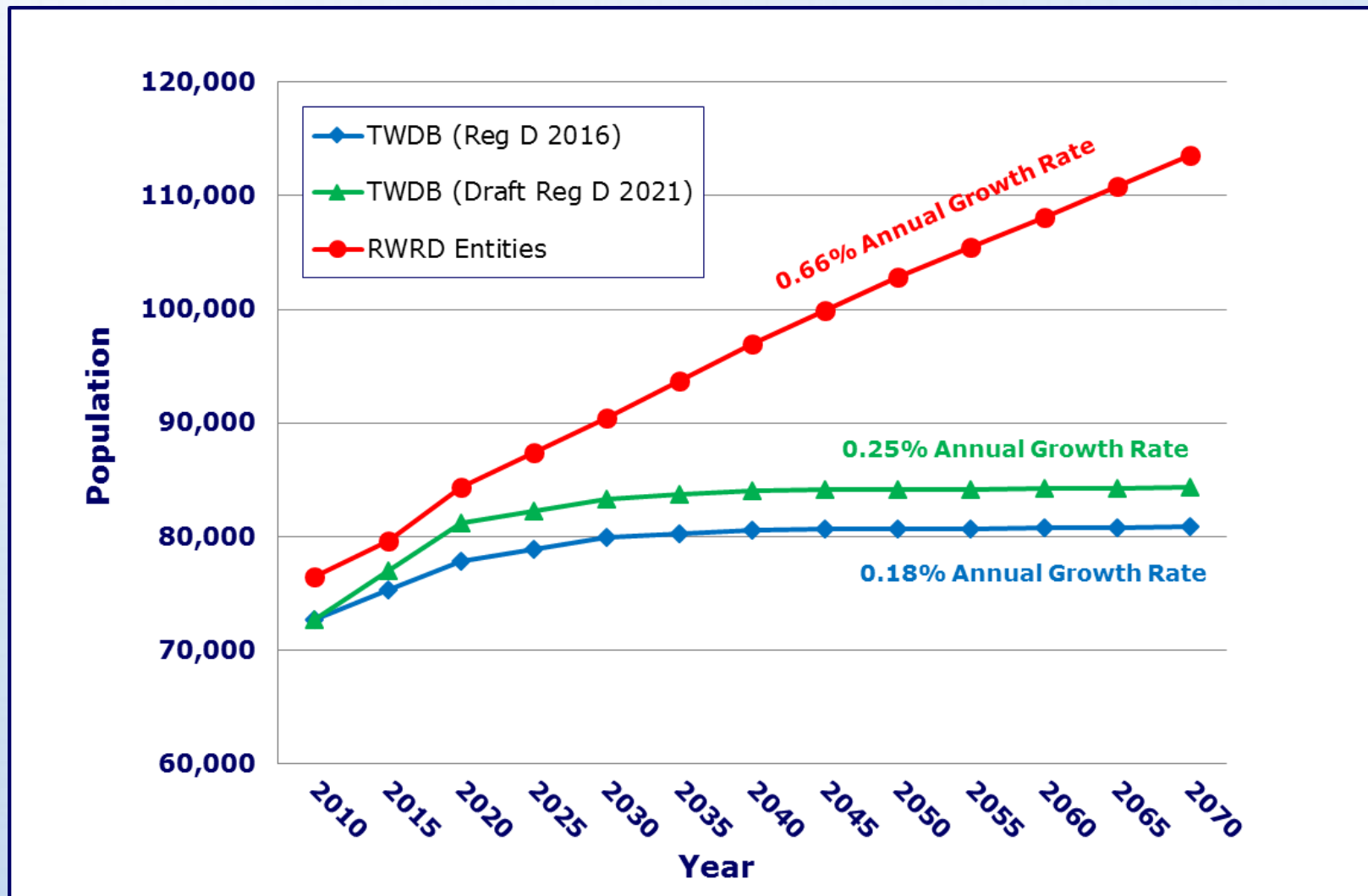
RWRD Counties – U.S. Census Data Forecast: Change in Population from 2010 to 2020



RWRD Counties – U.S. Census Data Forecast: Change in Population from 2010 to 2050



Population Projections: TWDB & Entity Data Comparison



Water Demand Projections



SUSAN ROTH
water and wastewater consulting

Average Annual Water Demand

- ◆ Basis for determining annual water supply needs;
- ◆ Used to determine operational costs;
- ◆ Range of participant's per capita water demand reported in 2014 TWDB Survey: 66 to 292 gpcd
- ◆ Range of participant's per capita water demand reported for study: 74 to 159 gpcd
- ◆ TWDB Water Consumption Goal: 140 gpcd
- ◆ Used TWU's data to calculate Average Day Water Demands for each entity

Maximum Day Water Demand

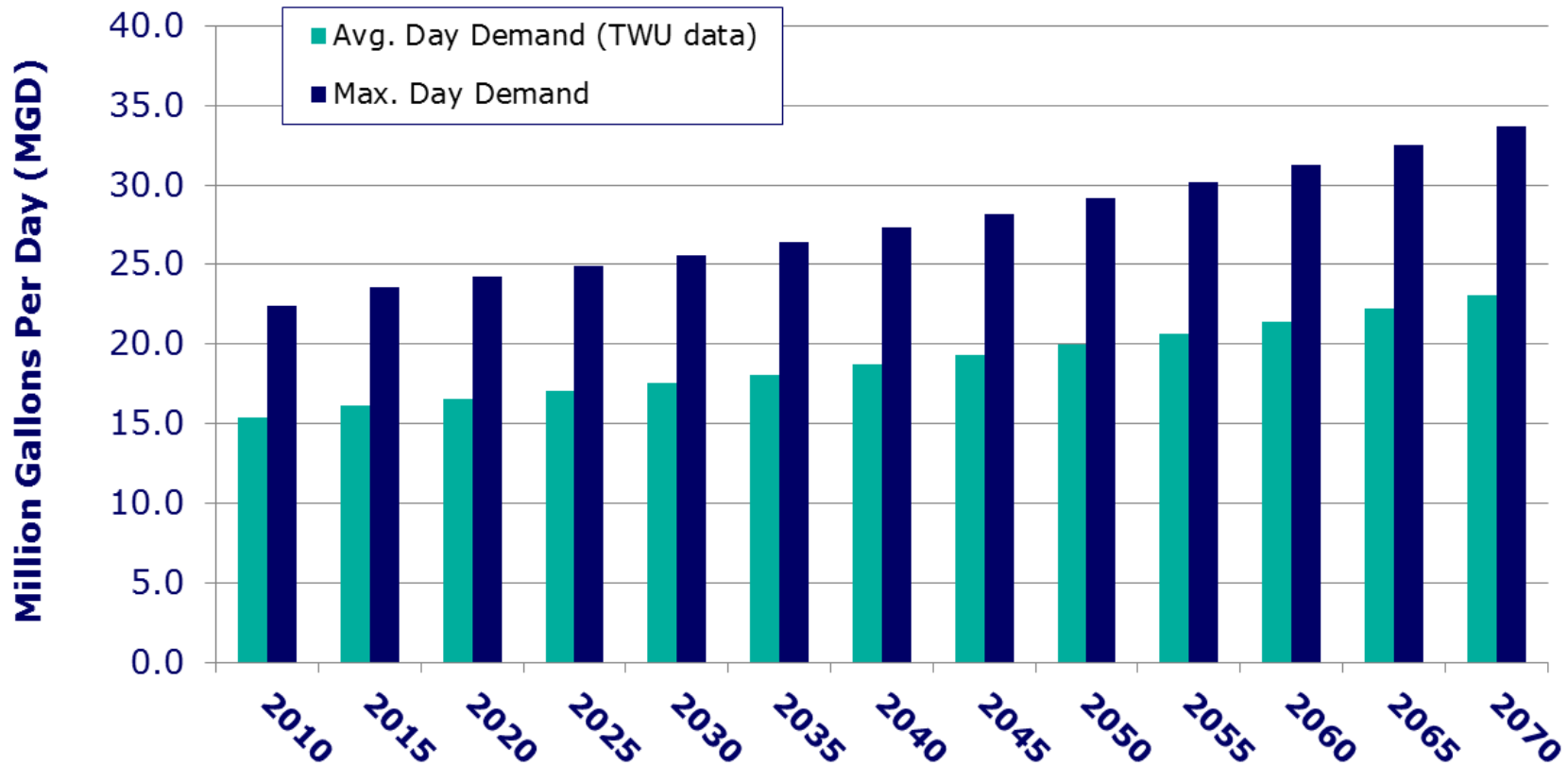
- ◆ Most important criteria for a municipal infrastructure planning project
- ◆ Basis for determining required capacity of intakes, wells and WTPs
- ◆ Basis for sizing transmission mains
- ◆ TCEQ Minimum Criteria: 0.6 gpm/connection
- ◆ Study team will evaluate water system data and compare to TCEQ design criteria
- ◆ Calculated Maximum Day and Average Day Water Demand Ratio for New Boston Road and Millwood WTPs to determine peaking factor to project max water demands through 2070

Additional Design Criteria

- ◆ Minimum transmission main pressure: 35 psi
- ◆ Maximum transmission main pressure: 200 psi
- ◆ Minimum clearwell capacity: 100 gallons per connection or 10% of daily plant capacity (for surface water systems)
- ◆ Design velocity in water transmission mains: 5.0 fps
- ◆ Water storage for booster pumping stations: 30 minutes of storage at the design pumping rate of the booster station



Water Demand Projections of Municipal Participants (2010–2070)



TexAmericas Center vs. Other Similar Industrial Parks

Comparison Factors	TexAmericas Center	Other Similar Industrial Parks
Largest Industrial Park	Texas	Oklahoma
Size of Park (Acres)	9,000	9,000
Distance from Metropolitan Area	Located between the Cities of Dallas (TX) & Little Rock (AR) along I-30 Corridor	Located 30 miles from Tulsa
Origin of Development	Developed in early 1940's as a military ordnance depot; later served munitions production & military vehicle maintenance	Developed by Dept. of Defense in 1940 to serve Ammunitions Facility
Beginning of Growth/ WTP Expansion History	Riverbend WRD acquired wet utilities – May 1, 2016	1978 (20 to 30 MGD Exp.) 1983 (30 to 40 MGD Exp.) Mid 1990s (40 to 50 MGD Exp.)
Number of Industrial Companies at Park	3	80 (initially 3 in 1978)

Other Study Factors

1) Regulatory

- TCEQ Minimum Criteria: 0.6 gpm/connection
- COE Ultimate & Interim Rule Curve

2) Capacity and Demand (Existing & Future)

- Municipal (Current & Potential Member Entities)
- Industrial (IP, TAC)
- Agricultural (Wheat, Soybeans, Timber, Livestock)
- Environmental Flows

3) Conservation and Firm Supply Availability

- TWDB Water Consumption Goal: 140 gpcd



Regional Water Infrastructure and Alternatives



SUSAN ROTH
water and wastewater consulting

1. New Boston Road Water Treatment Plant



*Source: RWRD Phase 3 Report on Water Treatment Plant and Raw Water Intake Site Selection; CH2M HILL (August 29, 2012)

New Boston Road Water System

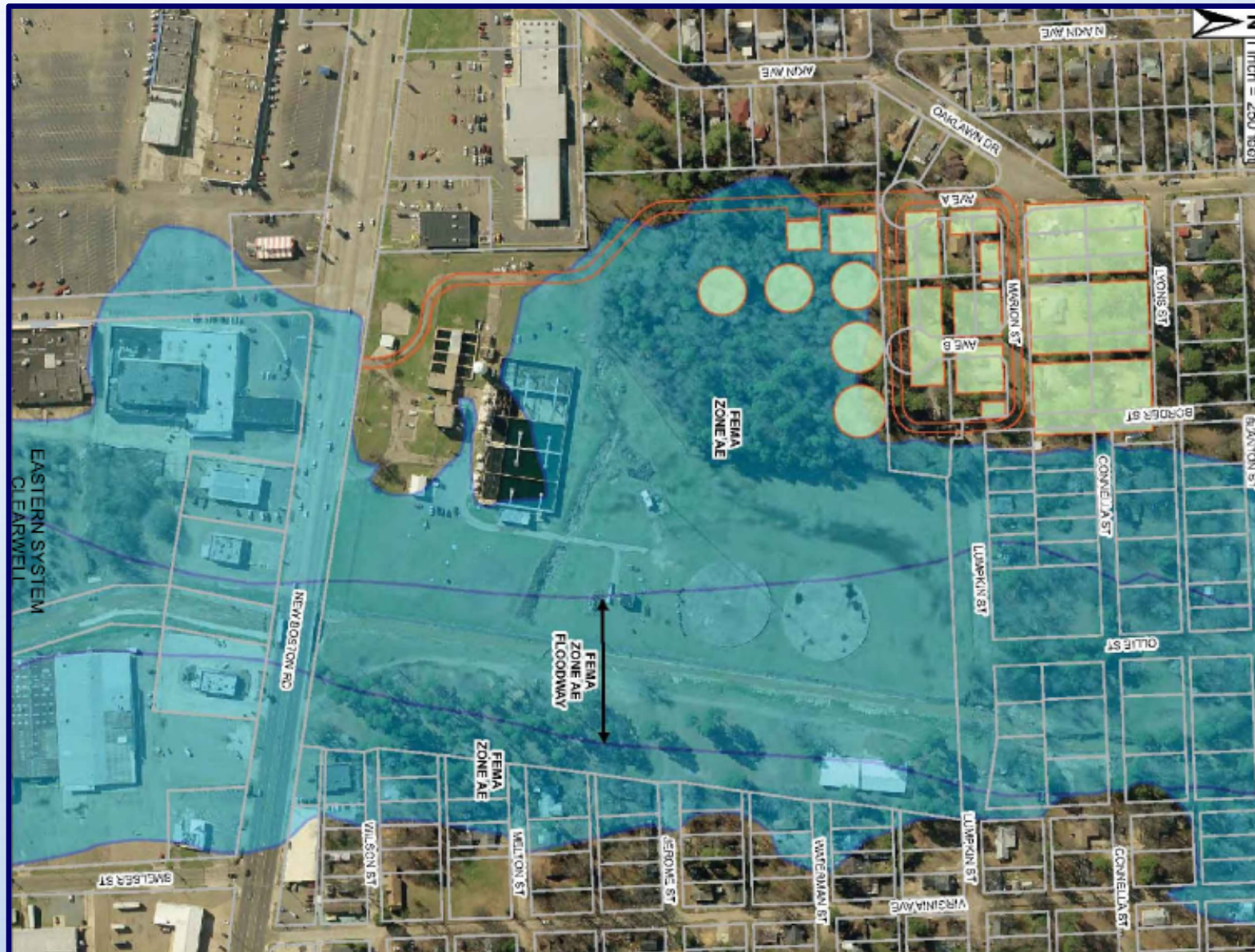
Benefits

1. **Well-maintained; recent upgrades and replacement of equipment**
2. **WTP currently in operation**
3. **Small improvements yield big gain**

Challenges

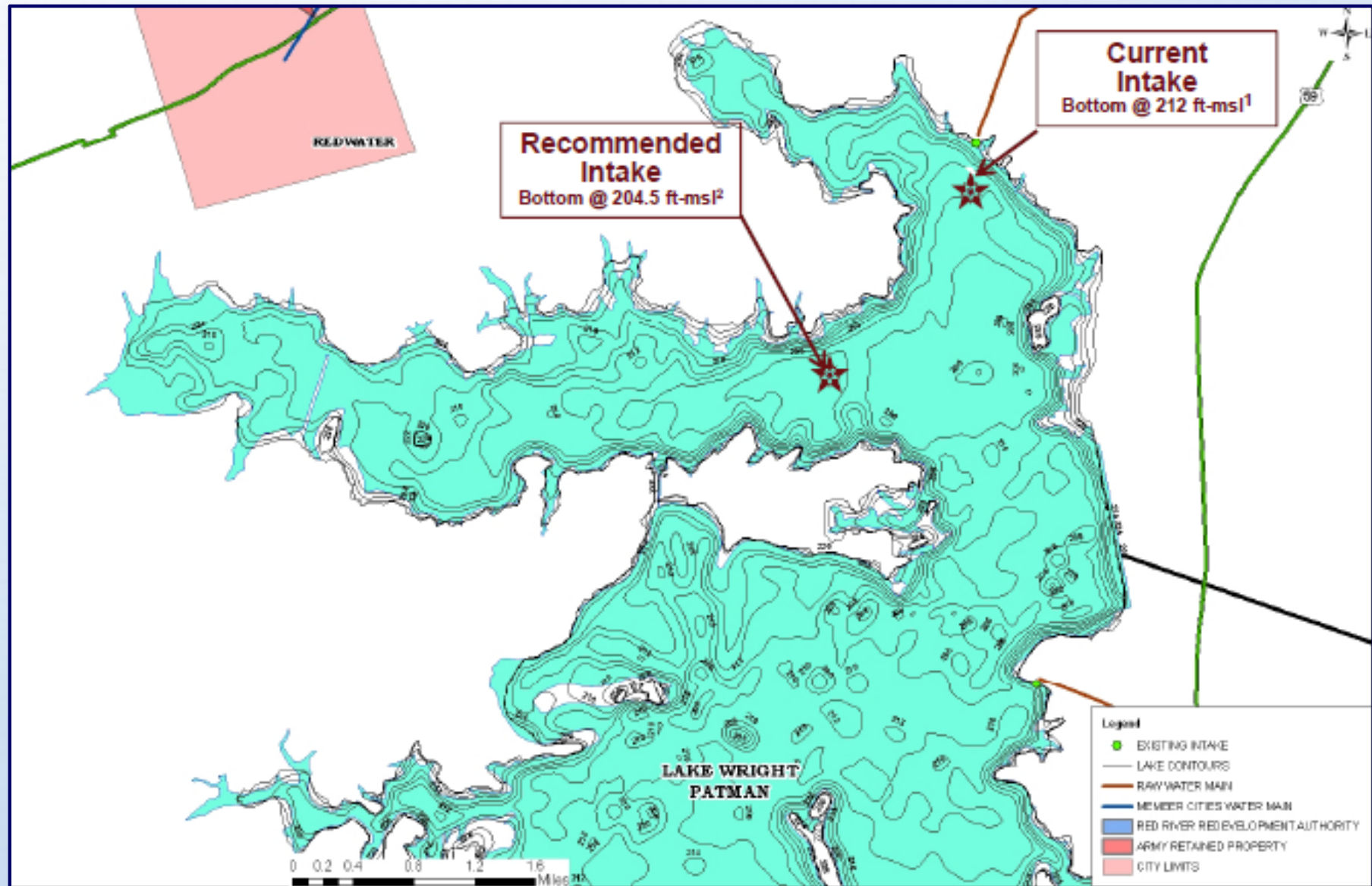
1. **Expansion of WTP**
 - a. WTP located in floodplain
 - b. Limited land available at WTP site
 - c. Capacity to meet future water demands
2. **Issues with Raw Water Delivery System**
 - a. Raw water intake – limiting factor
 - b. Modifications necessary to meet current needs

New Boston Road WTP – Floodplain Limits



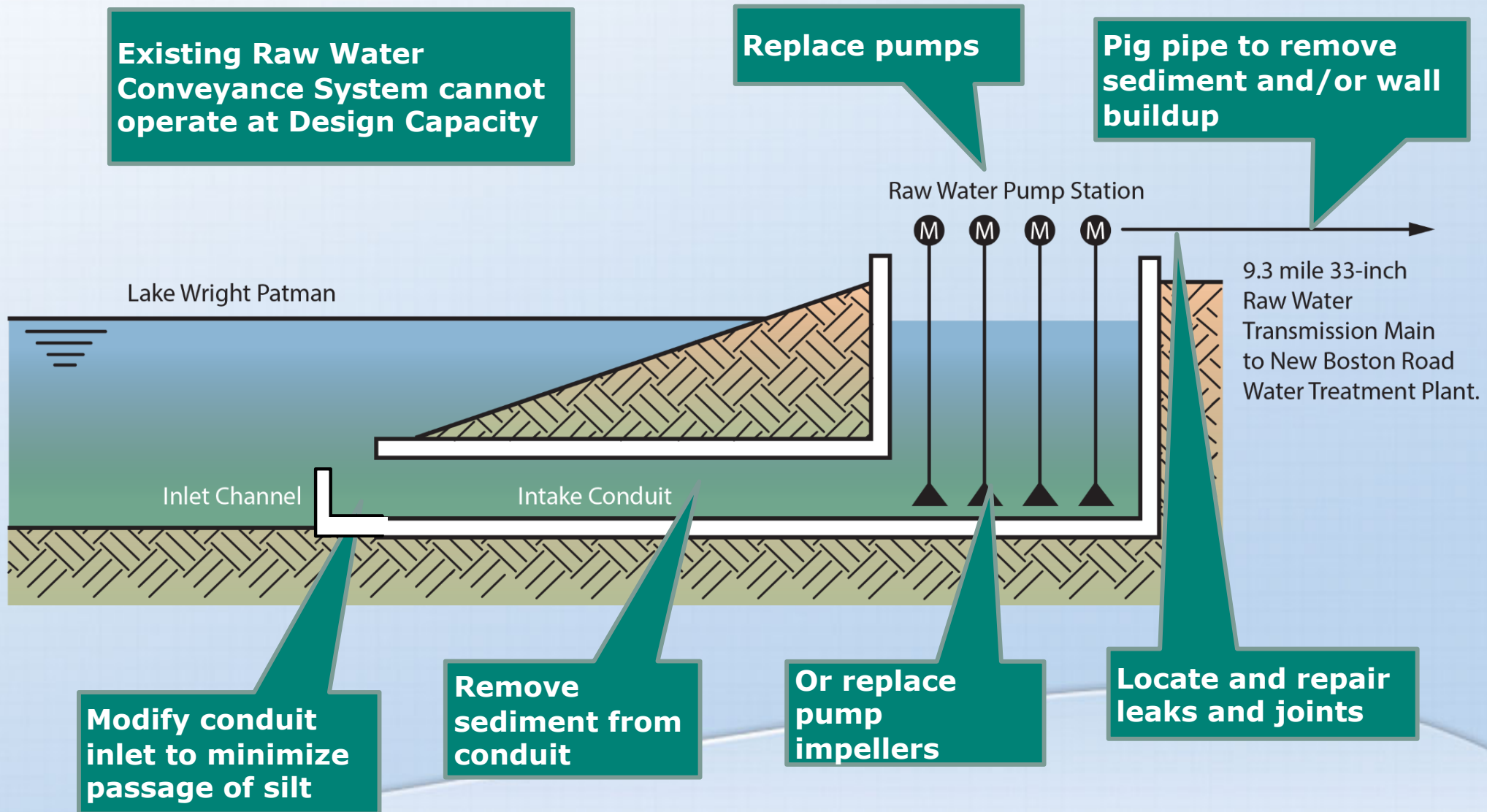
*Source: RWRD Phase 3 Report on Water Treatment Plant and Raw Water Intake Site Selection; CH2M HILL (August 29, 2012)

New Boston Road Raw Water Intake

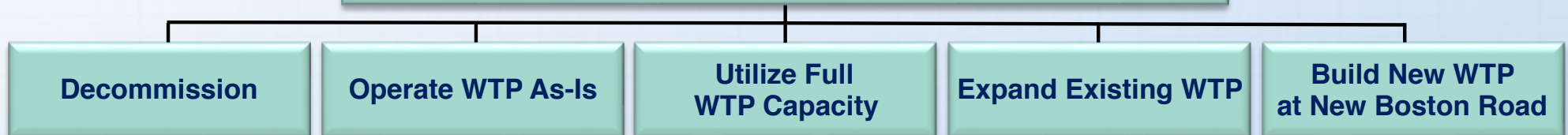


*Source: RWRD Phase 3 Report on Water Treatment Plant and Raw Water Intake Site Selection; CH2M HILL (August 29, 2012)

Potential fixes to recover lost hydraulic capacity



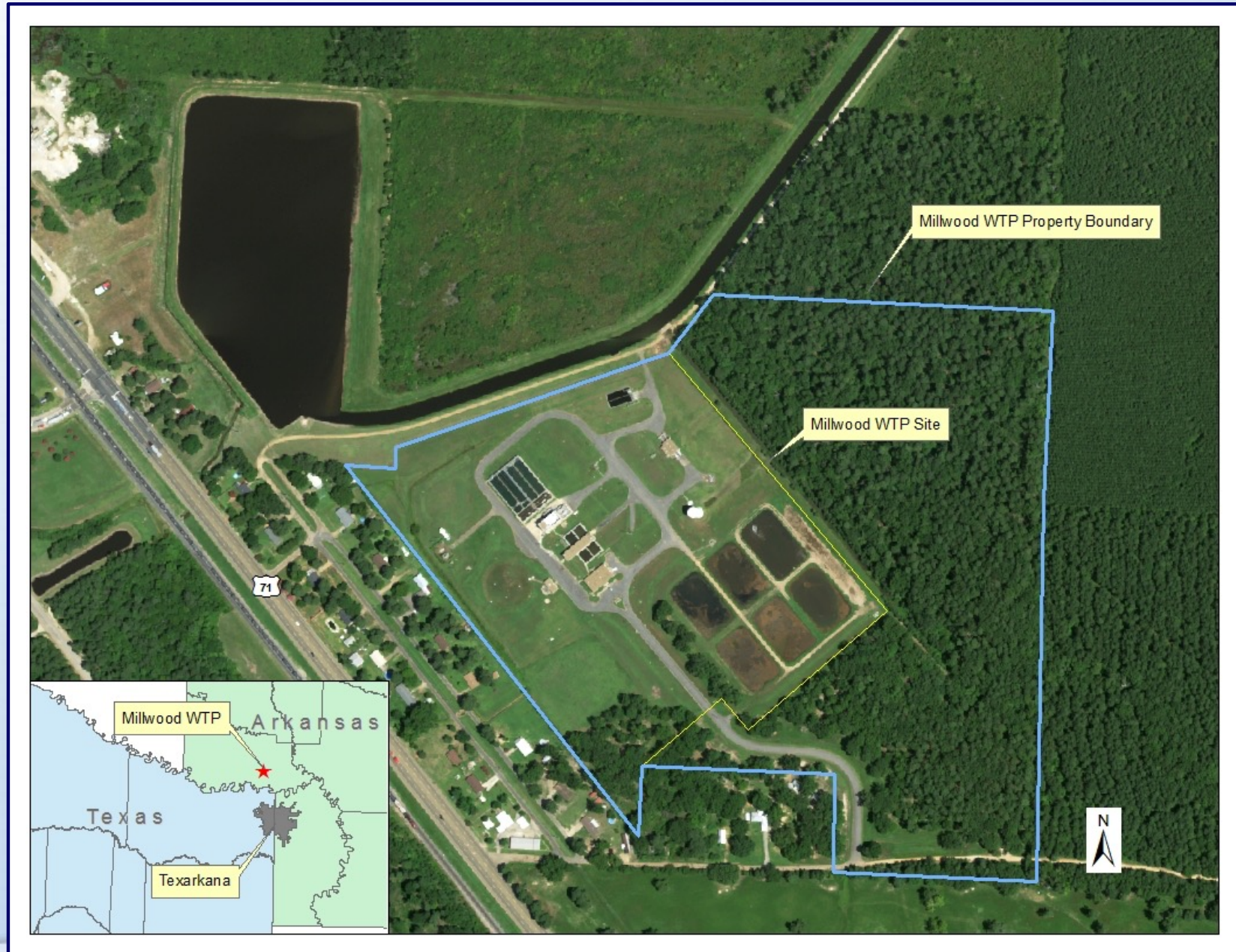
New Boston Road Water Treatment Plant



CONSIDERATIONS

- | Decommission | Operate WTP As-Is | Utilize Full WTP Capacity | Expand Existing WTP | Build New WTP at New Boston Road |
|--|--|---|--|---|
| <ul style="list-style-type: none">▪ Legal/contractual issues | <ul style="list-style-type: none">▪ WTP rated at 18 mgd▪ Operations and maintenance items | <ul style="list-style-type: none">▪ WTP design & 25 MGD permitted capacity▪ Modify raw water delivery system (intake, pump station, pipeline)▪ Operations and maintenance items | <ul style="list-style-type: none">▪ Firm water supply availability▪ Located in flood plain▪ Limited land available▪ Capacity of existing raw water delivery system (modify, parallel, or replace) | <ul style="list-style-type: none">▪ Firm water supply availability▪ Located in flood plain▪ Limited land available▪ Capacity of existing raw water delivery system (modify, parallel, or replace)▪ Large financial commitment |

2. Millwood Water Treatment Plant



Millwood Water System

Benefits

1. **WTP currently in operation**
2. **Ample water supply available**
3. **Plenty of land available for expansion (90 acre site)**
4. **WTP designed for mirror expansion of additional 20 MGD**

Challenges

1. **Significant structural issues**
2. **Water rights - Texarkana (AR) owns 162,200 ac-ft/yr in Lake Millwood**
3. **Funding and ownership of new WTP at Millwood**
4. **Interstate legal considerations**

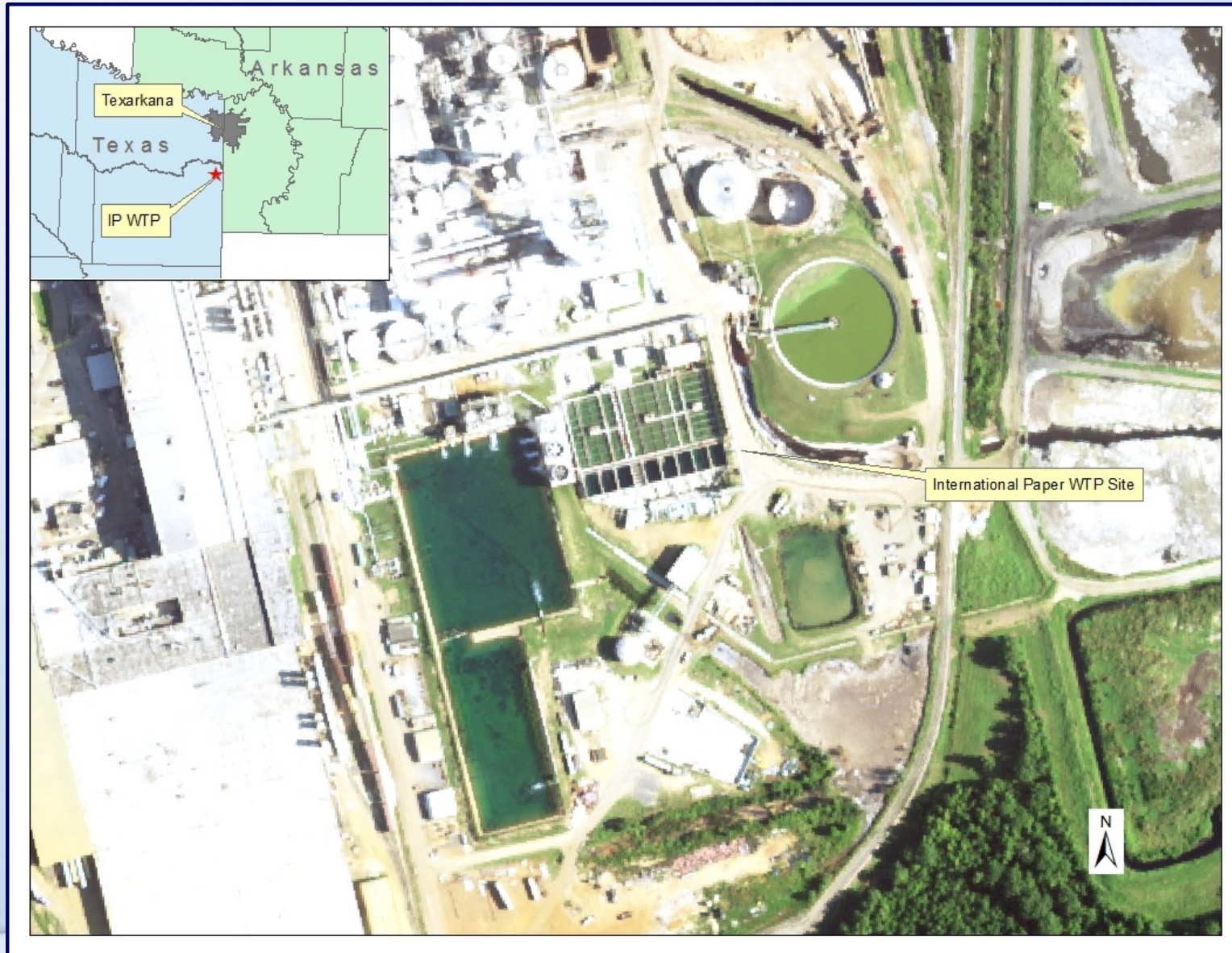
Millwood Water Treatment Plant



CONSIDERATIONS

- | | | | | |
|--|---|--|--|---|
| <ul style="list-style-type: none">▪ Legal/contractual issues▪ WTP serves both Texarkana (TX & AR) | <ul style="list-style-type: none">▪ WTP rated at 15 mgd▪ Structural integrity▪ Operations and maintenance items | <ul style="list-style-type: none">▪ WTP design & 20 MGD permitted capacity▪ Structural integrity▪ Operations and maintenance items | <ul style="list-style-type: none">▪ Original WTP design included plan for 20 MGD expansion▪ Additional land available▪ Interstate legal considerations | <ul style="list-style-type: none">▪ Water rights▪ Large site with plenty of land available▪ Funding and ownership of new WTP▪ Interstate legal considerations▪ Large financial commitment |
|--|---|--|--|---|

3. International Paper Water Treatment Plant



International Paper Water System

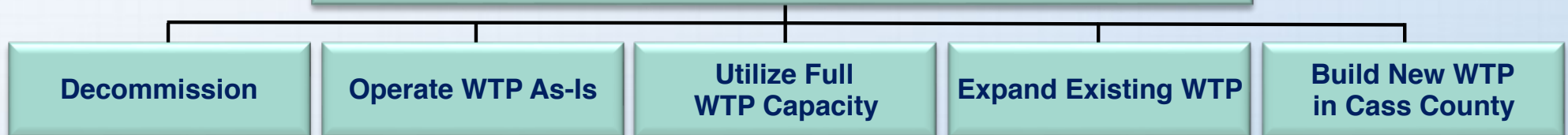
Benefits

1. **WTP currently in operation**
2. **Excess WTP capacity for municipal needs**
3. **Ideal raw water intake location**
4. **Ample contractual water rights available for industrial use**

Challenges

1. **WTP located in middle of process area on 4,000 acre site; limited for expansion due to plant footprint inside process area**
2. **Water rights - IP has a contract w/Texarkana (TX) for 120,000 ac-ft/yr in Wright Patman**
3. **Aging infrastructure**
4. **Funding and ownership of new WTP in Cass County**

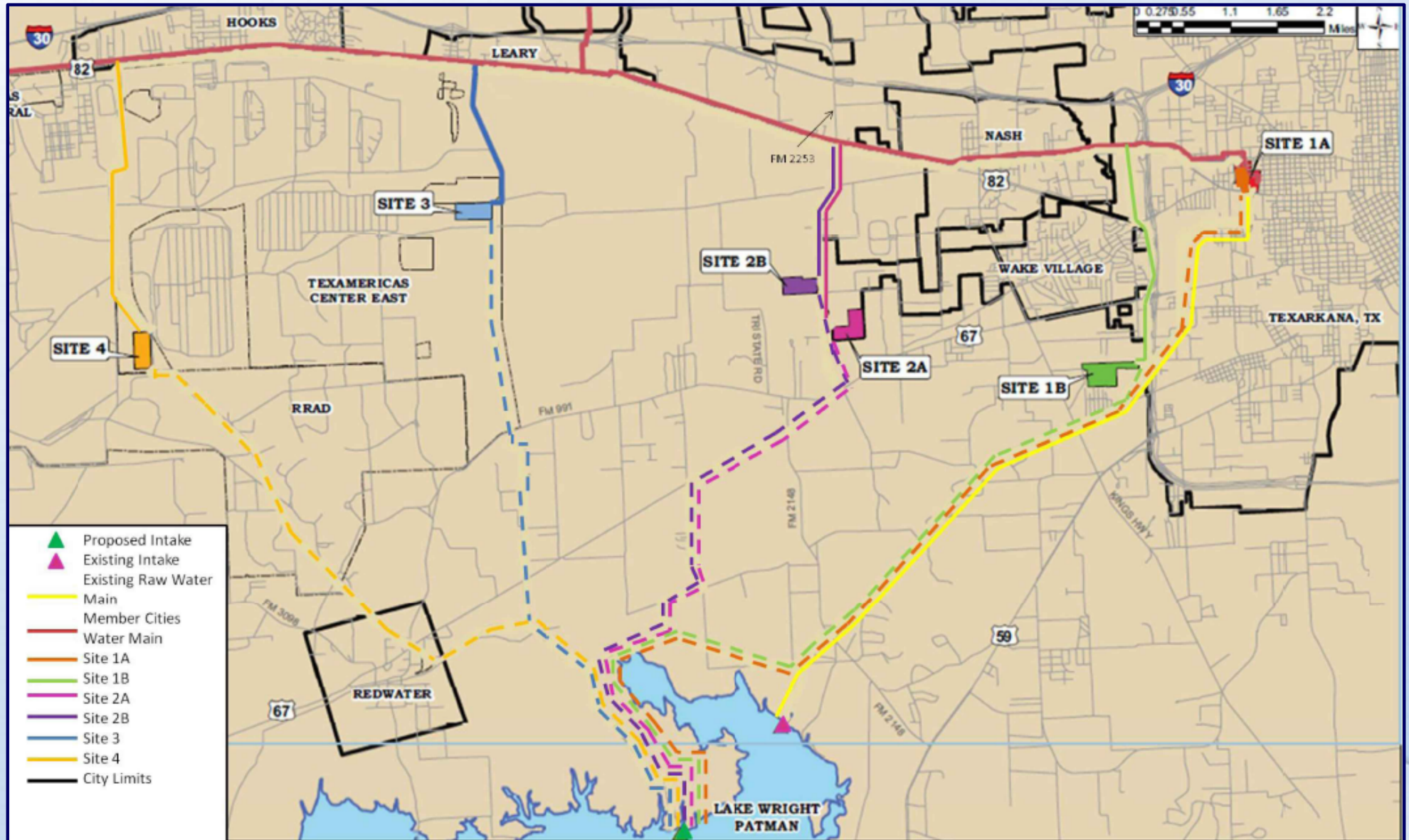
International Paper Water Treatment Plant



CONSIDERATIONS

- | | | | | |
|--|------------------------------------|--|---|---|
| ▪ Legal/contractual issues | ▪ WTP rated at 35 mgd | ▪ WTP 46 MGD permitted capacity | ▪ International Paper (IP) owns 120,000 ac-ft of water rights | ▪ Municipal water rights |
| ▪ WTP serves both industrial and municipal needs | ▪ Operations and maintenance items | ▪ Improvements needed to increase capacity from 35 to 46 MGD | ▪ Existing WTP site constraints | ▪ New WTP located on separate site from IP |
| | | ▪ Operations and maintenance items | ▪ Additional land available on overall IP site | ▪ Funding and ownership of new WTP |
| | | | ▪ Legal/contractual considerations | ▪ New WTP would serve manufacturing and municipal needs in area |
| | | | | ▪ Large financial commitment |

4. New Water Treatment Plant



*Source: RWRD Phase 3 Report on Water Treatment Plant and Raw Water Intake Site Selection; CH2M HILL (August 29, 2012)

New Water Facility

**New Raw Water Intake, Pump Station,
and Pipeline**

New Water Treatment Plant at Alternative Site

CONSIDERATIONS

- Site location and capacity of new raw water intake
- Contractual and environmental issues with COE
- Additional raw water and potable water to meet future regional water demands
- System redundancy and increased reliability
- Phased approach for constructing new WTP; first increment capacity would depend on number of member entities served (proposed 5+ MGD)
- Water rights
- System redundancy and increased reliability
- Revisiting Six Proposed Sites From CH2M Study:
 - Site 1A – New Boston Road WTP
 - Site 1B – Jarvis Parkway Corridor
 - Site 2A – City of Wake Village (FM2148)
 - Site 2B – Property Located North and West of Site 2A
 - Site 3 – TexAmericas Center (Bowie County Parkway)
 - Site 4 – TexAmericas Center (SW corner of former Ammunition Plant)

Q&A Discussion



SUSAN ROTH
water and wastewater consulting

Working Session – Regional Water Infrastructure Discussion

FACILITATORS

- ❖ **New Boston Road Water System (Darryl Corbin)**
- ❖ **Millwood Water System (Tony Smith)**
- ❖ **International Paper Water System (David Harkins)**
- ❖ **New Water Facility (Susan Roth)**

Working Session Format

- ◆ Participants have 30 minutes to visit each of the four infrastructure stations and to mark their top four regional alternatives.
- ◆ Participants will highlight their interest in a particular regional alternative by placing a yellow sticker next to the alternative/option listed at any of the infrastructure decision trees.
- ◆ For additional comments, participants can write them on sticky pads and place them on the designated 'parking lots' next to each infrastructure decision tree.
- ◆ At the end of the exercise, the Roth Team will highlight findings and common feedback themes for each infrastructure station.

Next Steps



SUSAN ROTH
water and wastewater consulting

Project Timeline

- ◆ **Project Kick-off Meeting (July 21, 2016)**
- ◆ **Data Collection Activities (August 31, 2016)**
- ◆ **WTP Site Assessments (October 26-27, November 2 and November 8, 2016)**
- ◆ **Second Meeting (January 31, 2017)**
 - Discuss population/water demand data and various regional water supply, distribution/treatment alternatives
- ◆ **Third Meeting (April 2017)**
 - Discuss preliminary cost analysis and evaluation of final alternatives for regional supply, distribution and treatment
- ◆ **Interim Work Session (July 2017)**
 - Discuss detailed cost analysis of final alternatives selected
- ◆ **Fourth Meeting (September 2017)**
 - Discuss comments on Draft Report
- ◆ **Finalize Report by December 31, 2017**

Project Contacts

Elizabeth Fazio Hale, J.D., LLM.
RWRD, Executive Director
(903) 831-0091
lizfazio@rwrdd.org

Susan K. Roth, P.E.
Susan Roth Consulting, LLC
(512) 796-6692
susan@srothconsulting.com



SUSAN ROTH
water and wastewater consulting