Region C Updates

Trinity-San Jacinto Basin and Bay Area Stakeholders Committee

December 18, 2008

Thomas C. Gooch, P.E.
Region C
A Little History

- January 2001 – RWPGs submitted plans to TWDB
- January 2002 – new statewide water plan
- January 2006 – RWPGs submitted new plans to TWDB
- November 2006 – new statewide water plan
What’s Ahead

- December 31, 2008 – RWPGs draft special studies are due to the TWDB
- April 30, 2009 – RWPGs final special studies are due to the TWDB
- 2009-2011 – RWPGs will prepare 2011 Plans
  - March 1, 2010 – Initially Prepared Plan due to TWDB
  - September 1, 2010 – RWPGs adopted plans due to TWDB
  - January 5, 2010 – final plans due to TWDB
Current Project Status

- **2006 Region C Water Plan** is most recent plan
- Special studies in draft format
  - Conservation and Reuse Study
  - Toledo Bend Study
  - Indirect Reuse Guidance Document
  - Direct Reuse Guidance Document
  - Four County Study (Ellis, Johnson, southern Dallas, and southern Tarrant)
  - Parker-Wise County Study
Basic Steps in Water Planning

- Develop population projections
- Develop water demand projections
- Determine existing supplies
- Determine future surplus or needs
- Evaluate and select water management strategies
Basic Steps in Water Planning

- TWDB resolves of interregional conflicts
- TWDB approves regional water plans
- TWDB develops and adopts State Water Plan
Population and Demand Projections

- Demand projections developed for:
  - Cities with populations greater than 500
  - Non-city water supplier providing at least 0.25 MGD
  - Remaining population absorbed in County-Other
  - Manufacturing
  - Mining
  - Irrigation
  - Livestock
  - Steam electric power
Currently Available Supplies

- TWDB definition – amount of water that can be diverted when considering permitted amounts, water quality, infrastructure limitations, and contract restrictions
- Surface water availability models (WAMs)
- Groundwater availability models (GAMs)
- Total current supply = 1,514,000 AF/Y in 2010
Comparison of Current Supplies to Projected Demands in Region C

Supply in Acre-Feet per Year

2010 2020 2030 2040 2050 2060

Reuse
Groundwater
Run-of-the-River/Local
Surface Water Imports
Region C Reservoirs
Demands
Water Management Strategies Recommended in Region C

- Conservation and reuse
- Connecting existing supplies
- New reservoirs
  - Muenster Lake (construction now complete)
  - Lower Bois d’Arc Creek Reservoir
  - Lake Ralph Hall
  - Marvin Nichols Reservoir
  - Lake Fastrill
Conservation and Reuse Strategies

- Basic Conservation Package
  - Recommended for all water user groups
  - Substantial amount of projected savings, low cost, relatively easy to implement
  - Low-flow plumbing fixture rules, public/school education, increasing water prices, water system audits and leak detection, and federal residential clothes washer standards
Conservation and Reuse Strategies

- Expanded Conservation Package
  - Recommended for large water user groups
  - Substantial savings from reuse, smaller amount of projected savings from conservation, competitive cost, more difficult to implement
  - Water conservation pricing structure, water waste prohibition, coin-operated clothes washer rebate, residential water audit, ICI rebate, ICI water audits, reuse
Conservation and Reuse Strategies

- Non-Municipal Conservation
  - Efficient new steam electric power plants
  - Reuse of treated wastewater
  - Golf course irrigation
  - Manufacturing rebate
  - Recycling of process water for mining

- Total Projected Savings of Conservation and Reuse is 1,245,000 AF/Y in 2060
Conservation and Reuse Strategies

- Large indirect reuse projects (2060)
  - NTMWD East Fork Reuse 102,000 AF/Y
  - DWU Southside 67,253 AF/Y
  - DWU Lewisville 67,253 AF/Y
  - Indirect reuse of return flows above Dallas Lakes 79,600 AF/Y
  - TRWD Cedar Creek reuse 52,500 AF/Y
  - TRWD Richland-Chambers reuse 63,000 AF/Y
Connect Existing Supplies
(2060 Supply)

- Additional Richland-Chambers Reservoir: 37,465 AF/Y
- Additional Cedar Creek Reservoir: 35,800 AF/Y
- Toledo Bend Reservoir: 400,000 AF/Y
- Lake Fork Reservoir: 120,000 AF/Y
- Lake Palestine: 111,000 AF/Y
- Wright Patman Lake: 112,100 AF/Y
- Lake Texoma: 169,500 AF/Y
- Oklahoma water: 115,000 AF/Y
New Reservoirs
(2060 Supply for Region C)

- Muenster Lake (complete)  500 AF/Y
- Lower Bois d’Arc Creek Reservoir  123,000 AF/Y
- Lake Ralph Hall  32,900 AF/Y
- Marvin Nichols Reservoir  489,800 AF/Y
- Lake Fastrill  112,100 AF/Y
Supply and Demand for Region C with the Development of New Supplies

Demand and Supply in Acre-Feet per Year

New Supplies
Existing Supplies
Demand

2010 2020 2030 2040 2050 2060
Recommended Water Management Strategies for Tarrant Regional Water District
Recommended Water Management Strategies for North Texas Municipal Water District

Supply and Demand in Acre-Feet per Year

- Oklahoma Water
- Toledo Bend Phase 1
- Marvin Nichols Reservoir
- Lower Bois d'Arc Creek Reservoir
- New Lake Texoma
- Upper Sabine Basin
- Interim GTUA Supply
- Additional Lake Lavon Yield
- East Fork Reuse
- Wilson Creek Reuse (new)
- Interim DWU Supply
- Conservation
- Lake Bonham
- Wilson Creek Reuse (permitted)
- Lake Chapman
- Lake Chapman (permitted)
- Lake Texoma
- Lake Texoma (permitted)
- Lake Lavon
- Total Currently Available Supplies
- Projected Demands

Decade
- 2010
- 2020
- 2030
- 2040
- 2050
- 2060
Region C Water Management Strategies in 2060

- If all recommended water management strategies are implemented, Region C will have supply of 4.15 million AF/Y
- Demand = 3.1 million AF/Y
- Cost of $13.2 billion
Results from Special Study on Conservation and Reuse

- Return flows can increase with out-of-basin water returned to the basin of use.
- Return flows can decrease when in-basin sources decrease (due to conservation or direct reuse).
Study of Return Flows

- Average return flows (2003-2007) in Region C were 698,000 AF/Y
- Return flows expected to increase to approximately 1.4 million AF/Y by 2060
  - 59% will be needed for implementation of recommended reuse projects
- Results based on net increase of regulated flows at Oakwood gage
- Based on modified version of Trinity WAM
Study of Return Flows

- Net increase to instream flows is lower than values reported in 2006 Region C Water Plan

- Most significant changes
  - Addition of projected return flows across the basin
  - Use of modified area-capacity tables to account for sedimentation
  - Use of firm yield demand instead of the permitted amount
Comparison of the Minimal Annual Flow at Trinity River near Oakwood

![Bar chart showing annual flow comparison]
Study Conclusions

- Overall, regulated flow leaving Region C will decrease until 2030 because proposed reuse projects will use more than the increase in return flows.
- Return flows expected to increase after 2030.
Recent Developments

Reuse Projects

- Significant progress being made
- North Texas likely leads the nation in municipal reuse projects
- Largest supplies from indirect reuse projects
  - TRWD
  - NTMWD
  - Others
- Direct reuse underway as well
- Most rapidly growing source of supply
Questions???