

Memorandum



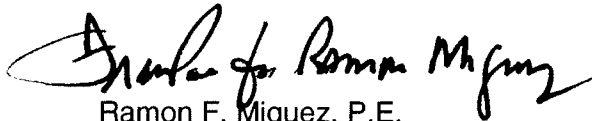
DATE October 10, 2008

TO Honorable Mayor and Members of the City Council

SUBJECT The Path to 2060: Dallas' Water Plan Update – Water Utilities Department

Attached is a briefing that will be presented to the Council on Wednesday, October 15, 2008. This briefing will provide an update on the status of the City's contractual relationship with the Tarrant Regional Water District for the Joint Lake Palestine Transmission System Study and the possible expansion of this relationship to include Oklahoma water.

Please let me know if you have any questions or need additional information.

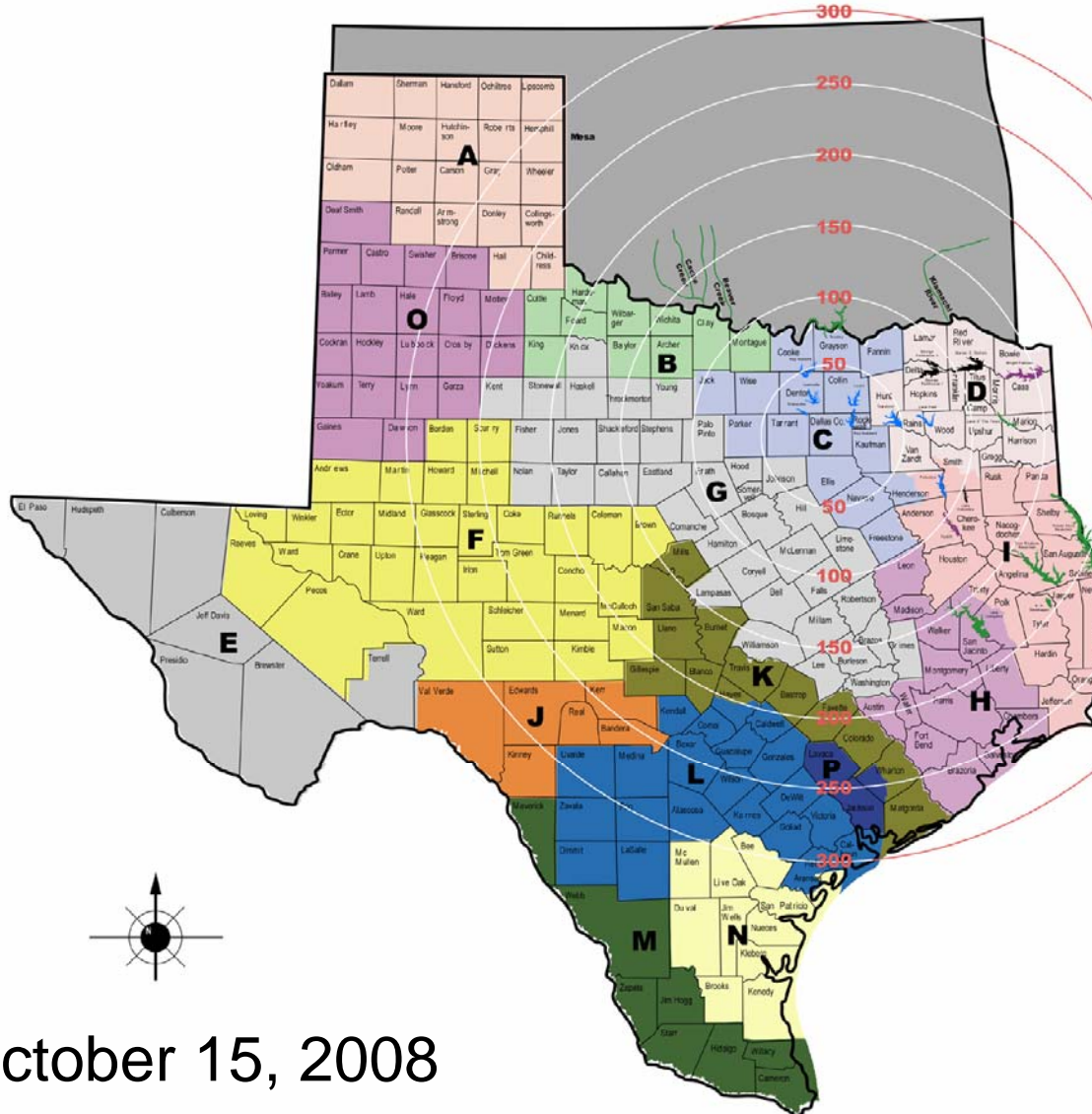


Ramon F. Miguez, P.E.
Assistant City Manager

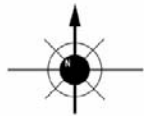
Attachment

C: Honorable Mayor and Members of the City Council
Mary K. Suhm, City Manager
Thomas P. Perkins, City Attorney
Deborah Watkins, City Secretary
Craig Kinton, City Auditor
Ryan S. Evans, First Assistant City Manager
David O. Brown, Interim Assistant City Manager
A.C. Gonzalez, Assistant City Manager
Jill A. Jordan, P.E., Assistant City Manager
David K. Cook, Chief Financial Officer
Jeanne Chipperfield, Director of Budget & Management Services
Jo M. Puckett, P.E., Director, Dallas Water Utilities

The Path to 2060: Dallas' Water Plan Update



The State's 16 Regional Planning areas are identified by the letters A to P. Dallas is in Region C.



October 15, 2008



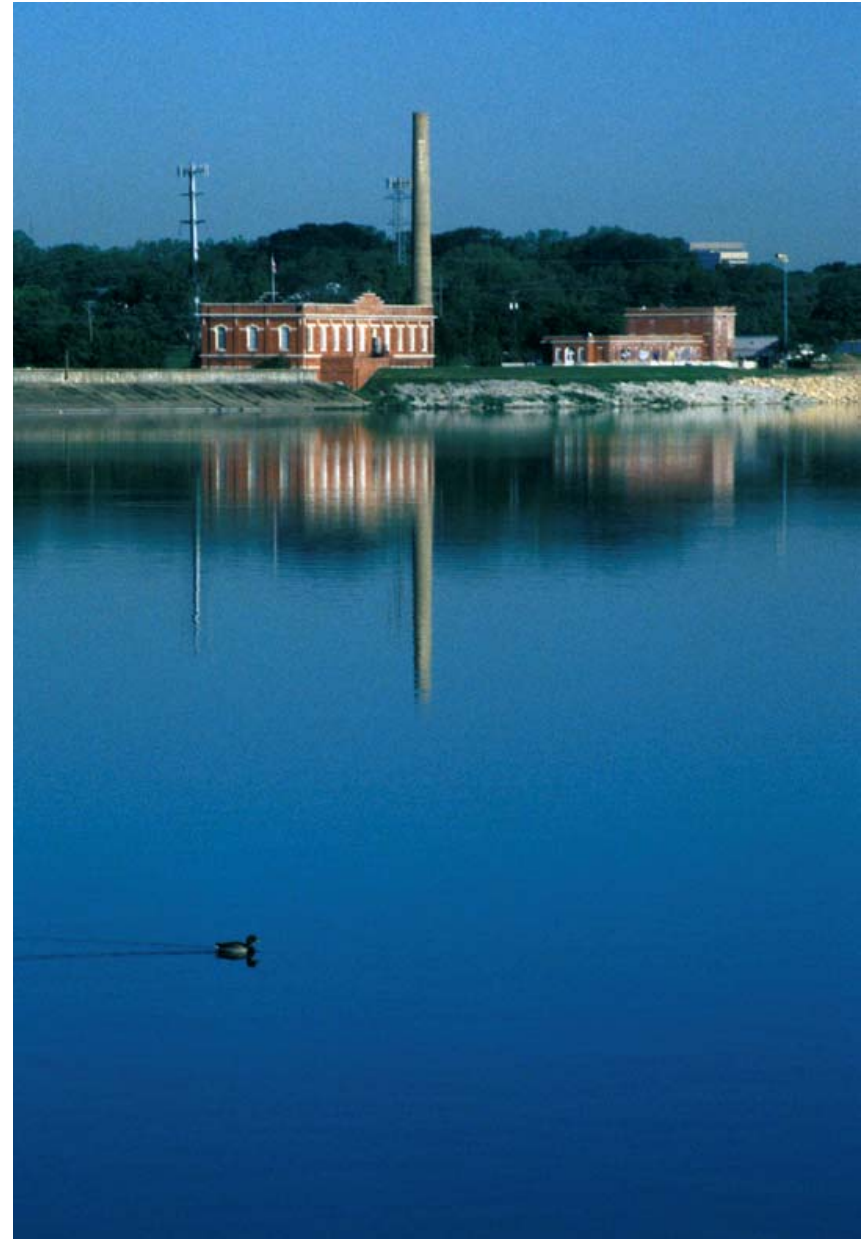
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Purpose of Briefing

- Provide an update on Dallas' contractual relationship with Tarrant Regional Water District and progress on the Joint Lake Palestine Transmission System Study and discuss enhancing the contractual relationship to include Oklahoma water

Outline

- Recap of previous briefing
- Lake Palestine Joint Transmission Study
- Oklahoma Water Supplies
- Upcoming and Future Dallas City Council Agenda Items
- Appendix



Executive Summary

- Dallas Water Utilities has been working with Tarrant Regional Water District (TRWD) to evaluate a joint transmission system from Lake Palestine
- TRWD and other North Texas water providers have applied for water rights in Oklahoma
- TRWD filed a federal lawsuit against Oklahoma claiming its moratorium on the sale of water out of the State violates the Interstate Commerce Clause
- Dallas and TRWD are interested in expanding their relationship to work together in acquiring Oklahoma Water

February 2008 Briefing Recap

- Lake Fork on track to be connected by Jan 2009
 - Final segment of pipeline complete, pump station under construction, and tie-in to existing line being made
 - Additional capital construction needed for full utilization of water
- City Council approved a study in 2006 to evaluate additional water supply in Lake Ray Hubbard; permit amendment has been filed with the State
- Lake Palestine currently scheduled to be connected by 2015; additional water from Lake Ray Hubbard could allow us to defer connection until 2020
- Implementation of the 2005 5-year water conservation strategic plan is ongoing, increasing our conservation efforts; next 5 year plan to be developed in 2009
- Direct reuse pipeline is currently under design

February 2008 Briefing Recap (continued)

- Will contract for return flows with multiple cities, including the larger cities around Lake Lewisville and other Denton County cities (implementation begins in 2010)
- Texas Commission on Environmental Quality (TCEQ) approved Dallas' reuse permits in October 2006; working with NTMWD to implement this strategy; currently negotiating for 24 MGD of reuse water with a goal to complete by late 2008
- Work continues on Wright Patman floodpool reallocation in 2035, as well as the proposed Lake Fastrill for 2045
 - Lawsuit ongoing against US Fish and Wildlife Service regarding location of National Refuge and the Fastrill reservoir site
- With added strategies, a Reservoir Optimization model is needed to assist Dallas staff in the decision making process
 - Model will facilitate efficient use of available water supply sources
 - Improve system operations
 - Maximize existing resources
 - Reduce operating costs

The Path to 2060 – Water Supply of 1,040.57 MGD

Current	Underway	Likely	Unsecured	Total Need (MGD)
<ul style="list-style-type: none"> • Ray Roberts/Lewisville • Grapevine • Ray Hubbard • Tawakoni • Elm Fork of Trinity 	<ul style="list-style-type: none"> • Lake Fork - 2009 (107.00 MGD) • Lake Palestine - 2015 (100.00 MGD) • Conservation - various dates (47.40 MGD) • Direct Reuse - various dates (18.25 MGD) 	<ul style="list-style-type: none"> • Contract for Return Flows - various dates (71.02 MGD) • Ray Hubbard Indirect Reuse - permitted - 2012 (60.00 MGD) • Lewisville Indirect Reuse - permitted - 2022 (60.00 MGD) 	<ul style="list-style-type: none"> • Wright Patman Flood Pool - 2035 (100.00 MGD) • Fastrill - 2045 (100.00 MGD) 	
376.90	272.65	191.02	200.00	1,040.57

- Our water supply in 2060 totals 1040.57 MGD 1040.57 (need)
 - Currently we have 376.90 MGD connected - 376.90 (current)
 - We are reasonably assured of an additional 272.65 MGD (underway) - 272.65 (underway)
 - An additional 191.02 MGD is likely - 191.02 (likely)
 - Wright Patman and Fastrill, totaling 200 MGD, are yet to be secured = 200.00
-
- 80 percent of 2060 water needs are reasonably assured, which meets Dallas' water needs through the year 2035

Lake Palestine Joint Transmission Study

Interlocal Cooperation Contract with Tarrant Regional Water District (TRWD)

- On September 26, 2007 the City Council approved an Interlocal Cooperation Contract with TRWD that:
 - Allows Dallas to share the cost of water transmission from distant sources
 - Provides the framework for increasing the reliability of water supplies for Dallas
 - Provides for the ability for Dallas to obtain interim and emergency water supplies

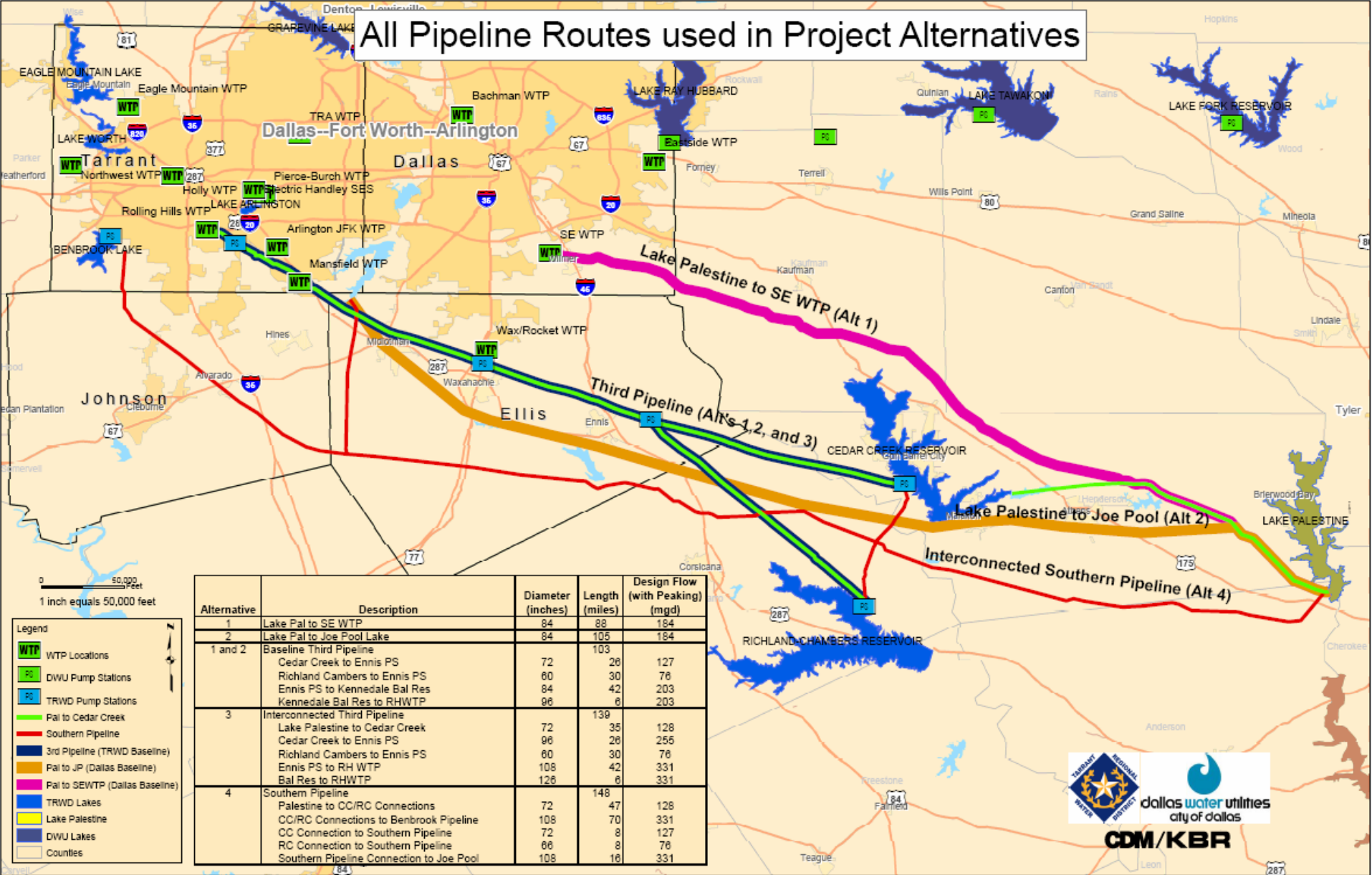


Lake Palestine Joint Transmission Study

- The initial phase of the study was designed as a “Fatal Flaw and Business Case Analysis” for the joint project
 - The fatal flaw analysis considered
 - water quality,
 - water treatment,
 - permitting, and
 - facility siting
 - The conclusion of fatal flaw analysis was that there did not appear to be any hindrances in joint development
 - The Business Case analysis evaluated the capital and life cycle cost of the project
 - The conclusion of the business case was that joint development would result in significant cost savings over the life of the project
- Additionally the consultants were asked to consider the feasibility of delivering Lake Palestine water to Dallas’ Bachman Water Treatment Plant
 - The Bachman WTP analysis resulted in the determination of initial pipeline routes and costs



All Pipeline Routes used in Project Alternatives



Lake Palestine Next Steps

- The continuation of Phase 1 will:
 - Determine the location of the pipeline corridor and associated cost,
 - Determine the implementation phasing schedule
 - Develop and evaluate the financial, legal and institutional issues associated with the City and TRWD working together
- At the conclusion of this additional work Dallas will have:
 - A single joint transmission system alternative to move forward to final design
 - A MOU with TRWD that will serve as the foundation for the contractual agreement for the design, construction, funding and operation of the transmission system
 - A construction schedule for the implementation of the joint transmission system
- October 22, 2008 Council agenda will have an item requesting additional funds to continue the work described above
- Study costs for the continuation of Phase 1 work will be split with TRWD on a 50-50 basis

Oklahoma Water Supplies

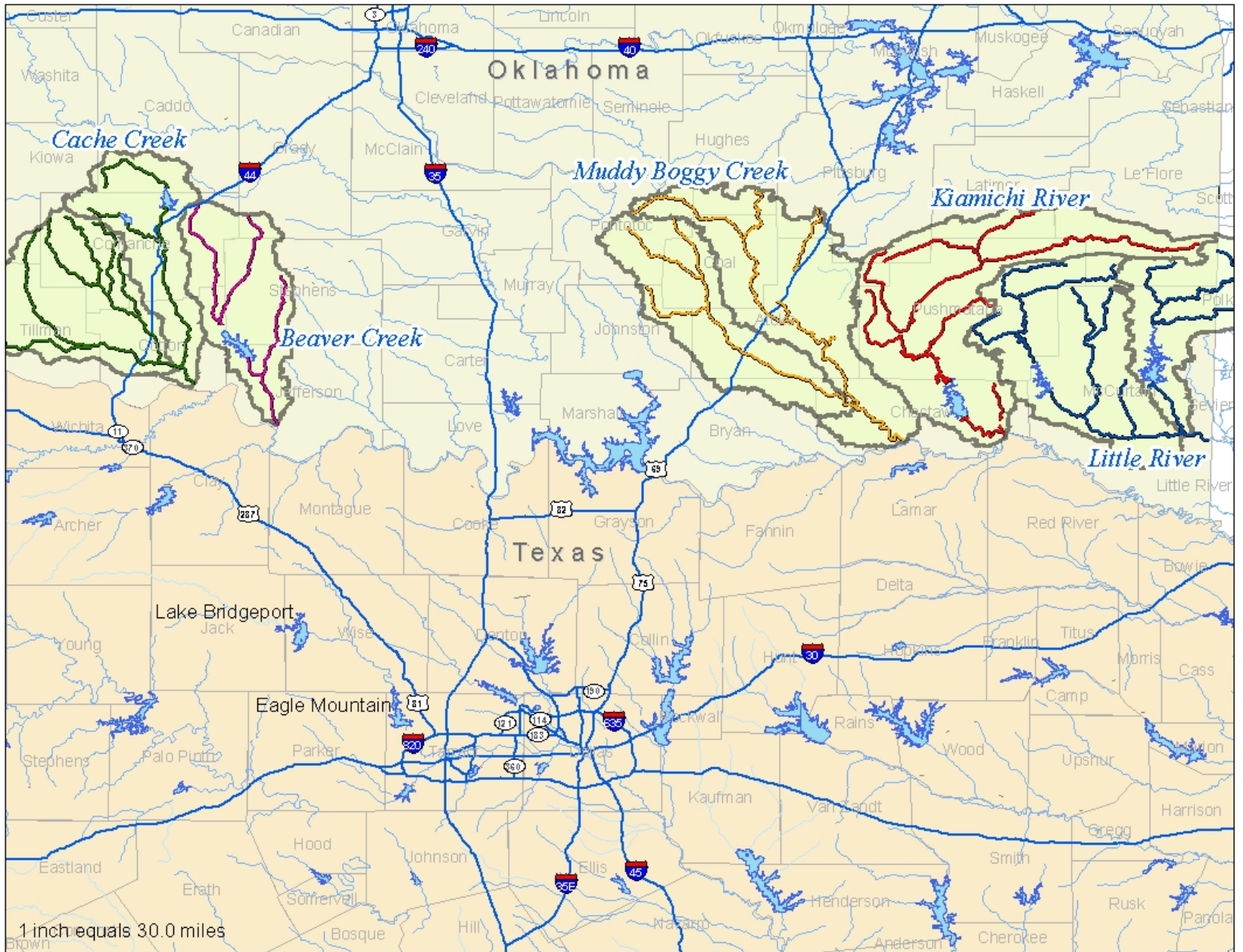
The Oklahoma Gulfbound Water Opportunity



Produced by Tarrant Regional Water District

Oklahoma Water

- Several North Texas entities have applied for water rights in Oklahoma
 - Tarrant Regional Water District
 - 460,000 ac-ft/yr
 - From the Kiamichi, Cache and Beaver River Basins
 - Filed Federal Law Suit
 - North Texas Municipal Water District
 - 750,000 ac-ft/yr
 - From the Kiamichi and the Muddy Boggy River Basins
 - Upper Trinity Regional Water District
 - 230,000 ac-ft/yr
 - From the Kiamichi and the Muddy Boggy River Basins
 - City of Irving
 - Water Sales and Purchase with Hugo, OK
 - Initial Project 25,000 ac-ft/yr
 - Right to purchase an additional 100,000 ac-ft/yr



Oklahoma Water (continued)

- Dallas has not applied for a water rights permit for Oklahoma Water
- Dallas' Interlocal Cooperation Contract (ICC) with TRWD dated September 26, 2007 includes a provision for Dallas and TRWD to jointly work together on "...delivering water supply from East Texas and **other areas...**"
- In order to reinforce the ICC, Dallas and TRWD have been discussing an amendment to the ICC regarding Oklahoma water that would:
 - Define the relationship between Dallas and TRWD during the Federal lawsuit and during subsequent negotiations for Oklahoma water
 - Allow Dallas to participate in the engineering, legal and lobbying cost to obtain Oklahoma water
 - Establish the methodology for Dallas to determine the amount of water it will receive from Oklahoma resources
 - TRWD current legal, engineering and lobbying cost to develop Oklahoma water is approximately \$2.7 million
 - Ongoing costs for the development of Oklahoma Water are dependent on the pending Court of Appeals decision
- North Texas Municipal Water District (NTMWD) has entered into a companion agreement with TRWD
- TRWD, NTMWD and Dallas will likely work together to obtain Oklahoma water
- Dallas' cost is likely to be on a pro rata basis

Upcoming City Council Agenda Items

- Consideration of the continuation of the Joint Transmission Study with TRWD to:
 - Refine the corridor location and associated cost;
 - Investigate the implementation phasing of the transmission system; and
 - Develop and evaluate the financial, legal and institutional issues associated with the City and TRWD working together on the joint project.
 - October 22 Council Agenda
- Consideration of Amendment to the Interlocal Cooperation Contract with TRWD that would:
 - Define Dallas' and TRWD relationship during the course of TRWD Federal Law Suit;
 - Allow Dallas to participate in the negotiations of the potential sale or lease of Oklahoma water;
 - Allow Dallas to participate in the engineering, legal and lobbying cost to obtain Oklahoma water; and
 - Allow Dallas to develop water supplies and transmission with TRWD from Oklahoma.
 - Proposed Addendum Item on October 22 Council Agenda

Appendix

- State Water Planning Effort
- Water Supply Activities Update
- Legislative Update
- Dallas' Recommended Water Management Strategies
- Dallas' Current Water Supply Strategies
- Dallas' Alternative Strategies
- Water Supply Risk Management
- Challenges to Water Supply Strategies

State Water Planning Effort

- Senate Bill 1 passed by the 1997 Legislature
- “Bottom Up” water planning process, with a report every 5 years
- Texas Water Development Board
 - Adopted water planning rules
 - Established 16 planning regions
 - Dallas is in Region C
- The State has begun the third round of regional planning
 - Regional Planning Groups to submit initial plans on 3/1/10
 - Regional Planning Groups to submit adopted plans on 9/1/10 for Board approval
 - State approved plan to be issued in January 2012



Water Supply Activities Update

Lake Ray Hubbard Additional Yield

- Council approved a hydrological study of this lake in 2006 to determine if additional water is available
- Amount of water may be as much as an additional 67 MGD, and at a minimum it will be 27 MGD
- Additional water is due to additional runoff due to urbanization of area around lake
- Added yield requires permitting from the State
 - Permit was filed in July 2007
- Discussions are underway with the TCEQ, North Texas Municipal Water District, Trinity River Authority, Tarrant Regional Water District and the City of Houston to move this permit forward
- Additional water from Lake Ray Hubbard could allow Dallas to defer the Lake Palestine connection until around 2020

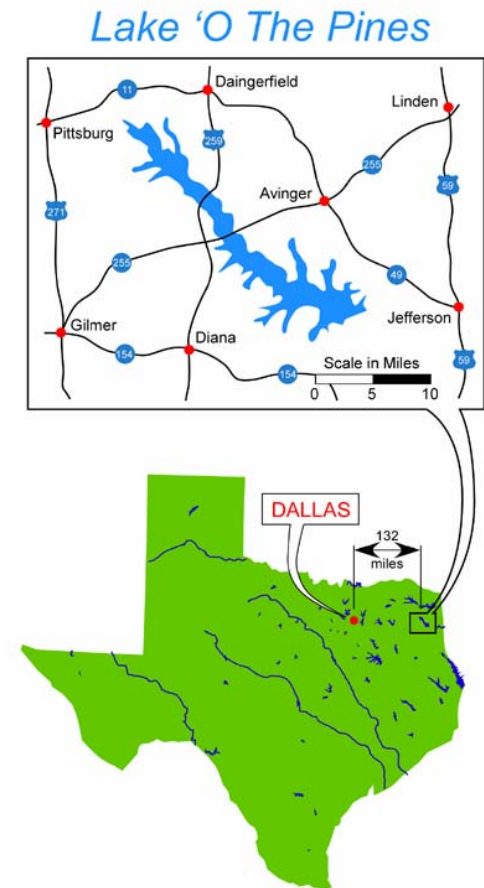
Return Flows and Reuse

- The City has been negotiating with the North Texas Municipal Water District (NTMWD) to exchange return flows in Lake Ray Hubbard
- NTMWD has permitted return flows in Lake Ray Hubbard
- NTMWD has constructed a wetland on the East Fork of the Trinity River near the main stem of the Trinity River.
- Dallas has permitted return flows along the main stem of the Trinity River
- NTMWD Contract will:
 - Exchange Dallas' return flows from Central and/or Southside for a like amount of NTMWD return flows in Lake Ray Hubbard
 - Exchange Dallas' return flows from Central and/or Southside for a like amount of NTMWD return flows in Lewisville Lake
 - Pass NTMWD return flows through Lake Ray Hubbard until facilities can be constructed to provide NTMWD with Dallas' Central and/or Southside return flows at NTMWD's wetland
 - Contract will be presented to Council for approval in an upcoming Council meeting in 2008



Lake O' the Pines

- The Northeast Texas Municipal Water District published a notice of “Available Water and Opportunity to Express Interest”
- Dallas responded to the opportunity to Express Interest in May 2008
- There is approximately 100,000 ac-ft of water available in Lake O' the Pines with an estimated additional 70,000 ac-ft if the level of the lake could be raised
- Hydrologic studies to accurately quantify the amount of water currently available and potentially available in the future will be needed



Sabine River Basin Additional Supply

- Have begun contract negotiations with Sabine River Authority to:
 - Secure water supply in Toledo Bend Reservoir
 - Develop run-of-the-river supplies upstream of Toledo Bend closer to Dallas
 - Overdraft existing reservoirs (Lakes Tawakoni and Fork)
 - Provide replacement water supplies to offset existing SRA contracts in Lakes Tawakoni and Fork in order to make supplies available to Dallas

Future City Council Agenda Items

- Consideration of the Pass Through Agreement with NTMWD to:
 - Exchange Dallas' return flows from Central and/or Southside for a like amount of NTMWD return flows in Lake Ray Hubbard;
 - Exchange Dallas' return flows from Central and/or Southside for a like amount of NTMWD return flows in Lewisville Lake; and
 - Pass NTMWD return flows through Lake Ray Hubbard until facilities can be constructed to provide NTMWD with Dallas' Central and/or Southside return flows at NTMWD's wetland.
 - Late 2008

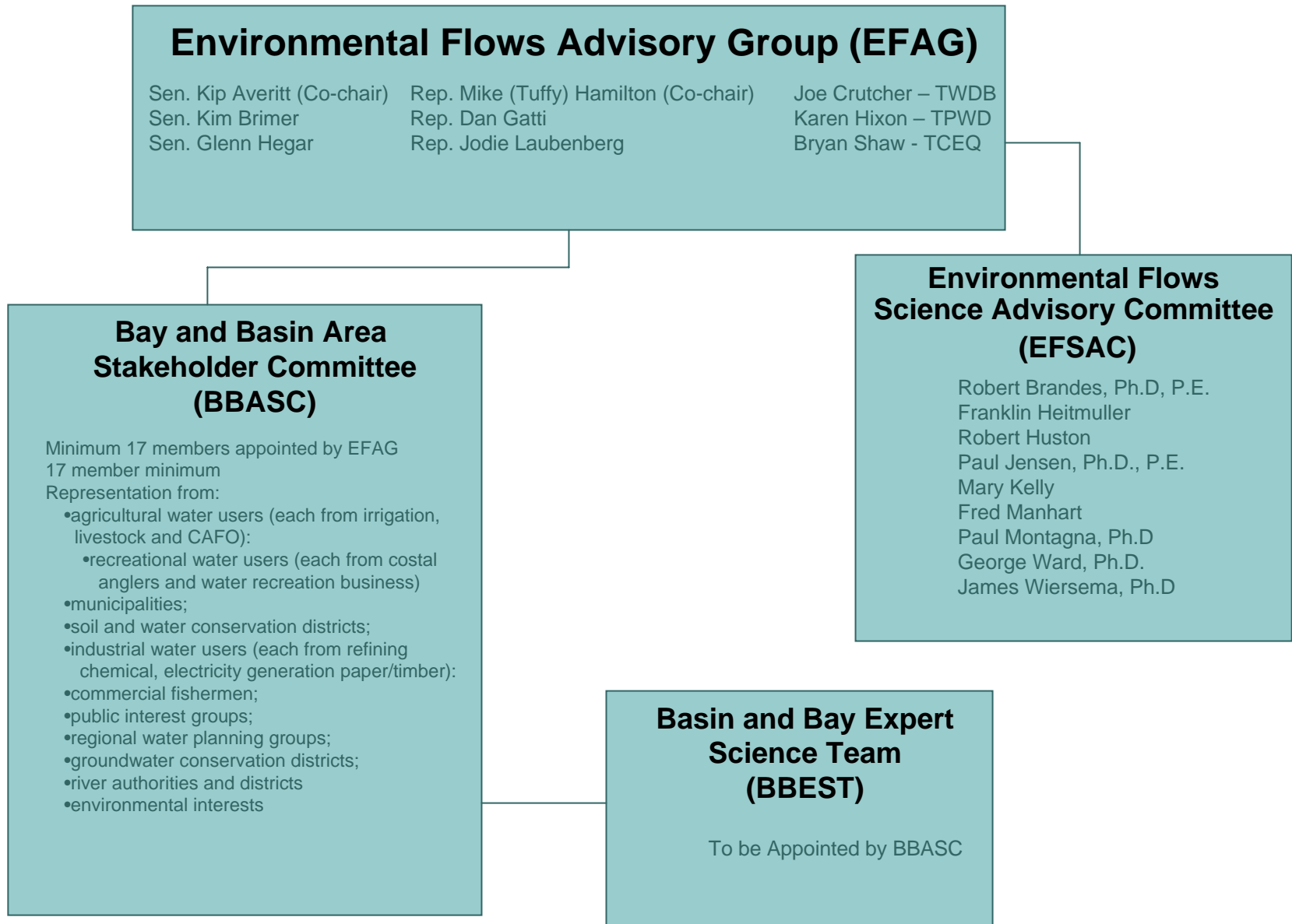
- Consideration of a Sabine River Basin Water Supply Contract with the Sabine River Authority that would:
 - Secure water supply in Toledo Bend Reservoir;
 - Develop run-of-the-river supplies upstream of Toledo Bend closer to Dallas;
 - Develop new reservoir site(s);
 - Allow for the overdrafting of existing reservoirs (Lakes Tawakoni and Fork); and
 - Provide replacement water supplies to offset existing SRA contracts in Lakes Tawakoni and Fork in order to make supplies available to Dallas
 - Early 2009

Legislative Update

State of Texas Legislative Activities

- With SB 3, HB 3 and HB 4 passed into law, containing overarching provisions regarding Environmental Flows and Water Conservation
 - The Environmental Flows Advisory Group has been appointed
 - The Science Advisory Committee has been appointed
 - The Trinity and San Jacinto River and Galveston Bay Basin and Bay Area Stakeholders Committee (BBASC) has been appointed and contains representation from the City of Dallas
 - The Trinity and San Jacinto River and Galveston Bay Basin and Bay Expert Science Team is to be appointed by the BBASC
 - The Sabine and Neches River Basins and Sabine Lake Bay BBASC has been appointed and contains representation from the City of Dallas
 - The Sabine and Neches River Basins and Sabine Lake Bay Basin and Bay Expert Science Team is to be appointed by the BBASC
- Water Conservation Advisory Council to monitor the development and implementation of water conservation strategies in regional water plans has been appointed
 - Workgroups have been established:
 - Awareness & Public Recognition;
 - Metrics & Trend;
 - Regional Plan Implementation;
 - Resource Library & BMPs; and
 - Certified Training
- Legislation also established a Study Commission composed of 3 members from Region C and 3 members from Region D to review water supply alternatives available for Region C
 - Study Commission has been appointed
 - Alternatives to be reviewed include Wright Patman Lake, Toledo Bend reservoir, Lake Texoma, Lake O' the Pines, other existing and proposed reservoirs, and groundwater
 - Report from this commission is due by December 1, 2010

Environmental Flows Committee Structure



Environmental Flow Activities

- Interlocal Agreement between City of Dallas, TRA, NTMWD, TRWD and City of Houston through TRA (5 Party Group)
- Technical review of the water availability in the Trinity River Basin has shown that when the State Methodology is tested against an independent data set, it fails to reproduce comparable output.
- Continuation of Work
 - The 5 Party Group continues to work toward improving knowledge as to the extent freshwater inflow influences Galveston Bay by:
 - Utilizing improved representations of:
 - Abundance – Usage of TPWD Coastal Fisheries Data that is scientifically sampled versus catch data reported by commercial fisherman.
 - Inflow – Rather than rigid calendar periods, the hydrology of watersheds is characterized by identifying the flow patterns the Bay responds to (i.e. the spring and fall pulses of flow).
 - Investigating various statistical methods (linear, non-linear) to attempt to find better relations between marine life and inflow
 - Ultimately, this study's objective is to develop a statistical flow distribution to *maintain* Galveston Bay's ecological health

Dallas' Current Water Supply Strategies

Current Dallas Water Supply Strategies

(Included in the State's 2007 Water Plan)

- Strategies were adopted by the City Council in March 2005
- Connect existing supplies to Dallas' system
 - Lake Fork by late 2008/early 2009
 - Lake Palestine by 2015
- Recommended Strategies
 - ✓ Water Conservation
 - Contract for return flows
 - Additional direct reuse
 - Lake Ray Hubbard and Lake Lewisville indirect reuse
 - Lake Wright Patman floodpool reallocation
 - Construct Lake Fastrill

✓ = ongoing

Recommended Water Management Strategies

Progress Report

Water Management Strategies	Projected Supply (MGD)	Progress	Project Status
Conservation	47.40	<ul style="list-style-type: none"> - Conservation program underway - Average annual savings are currently estimated to be approximately 32 MGD 	Underway
Return Flows	71.02	<ul style="list-style-type: none"> - Obtained approximately 12 MGD of return flows as part of the Lewisville Lake Reuse permit 	Underway
Lake Ray Hubbard Reuse	60.0	<ul style="list-style-type: none"> - Negotiating with NTMWD for reuse swap (Approx. 40 MGD) - Contract in final draft and anticipated to be executed by the end of 2008. 	Contract Negotiations
Lewisville Lake Reuse	60.0	<ul style="list-style-type: none"> - Negotiating with NTMWD for reuse swap (Approx. 36 MGD) - Contract in final draft and anticipated to be executed by the end of 2008. 	Contract Negotiations
Direct Reuse	18.25	<ul style="list-style-type: none"> - Cedar Crest golf course currently using direct reuse water - Plans are underway to add additional facilities 	Underway
Lake Fork	107.0	<ul style="list-style-type: none"> - Pipeline construction is scheduled to be complete by January 2009 	Construction
Lake Palestine	100.0	<ul style="list-style-type: none"> - Study with Tarrant Regional Water District to determine feasibility of a Joint Transmission System 	Corridor Study
Wright Patman Flood Pool Raise	100.0	<ul style="list-style-type: none"> - Region C and D Study Committee appointed by the Legislature - Awaiting outcome of report due to Legislature and Governor by Dec. 1, 2010 	Legislative Study
Fastrill Reservoir	100.0	<ul style="list-style-type: none"> - Wildlife Refuge established in footprint of reservoir site - Dallas and TWDB filed Federal lawsuit - Federal lawsuit currently in Court of Appeals 	Litigation

Alternate Water Management Strategies

Progress Report

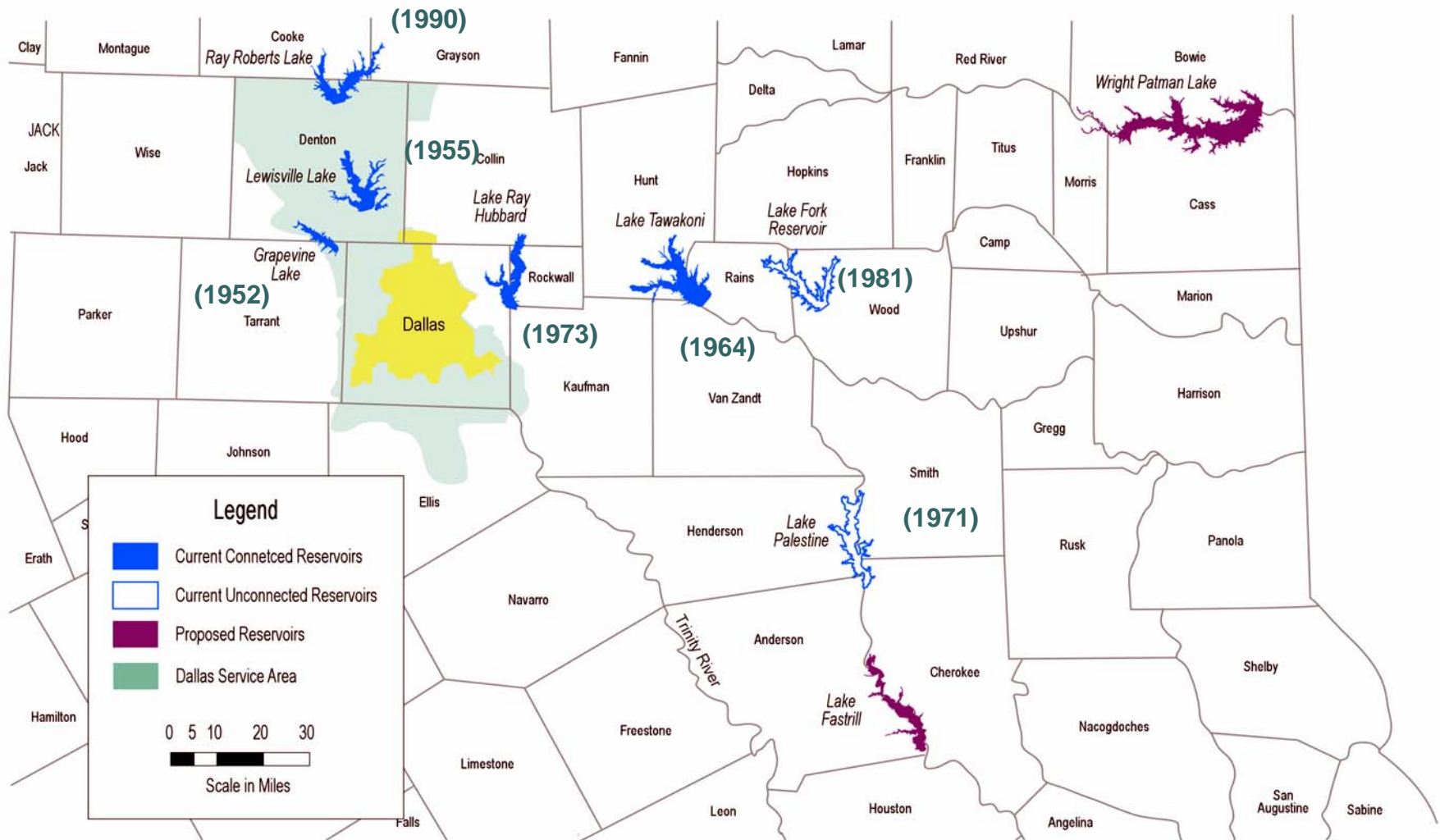
Water Management Strategies	Projected Supply (MGD)	Progress	Project Status
Toledo Bend Reservoir	200	<ul style="list-style-type: none"> - Sabine River Basin Supply contract negotiation underway with Sabine River Authority - Scope of work being developed for Sabine River Basin Hydrologic Study 	Contract Negotiations
Lake Texoma	100	<ul style="list-style-type: none"> - No progress reported 	Hold
Lake O' the Pines	80	<ul style="list-style-type: none"> - The Northeast Municipal Water District sent out a notice for the "Expression of Negotiation Interest" - Dallas Responded to "Expression of Negotiation Interest" in May 2008 	Letter of Interest
Lake Livingston	100	<ul style="list-style-type: none"> - No progress reported 	Hold
Sam Rayburn / B.A. Steinhagen	100	<ul style="list-style-type: none"> - No progress reported 	Hold
Mesa Groundwater	100	<ul style="list-style-type: none"> - Recent news reports state that Mesa Water and the Roberts County Freshwater Supply District suspended plans to pipe water from beneath Roberts County to a major city with water shortfall. 	Hold
Marvin Nichols Reservoir	100	<ul style="list-style-type: none"> - Designated Unique Reservoir Site - Region C and D Study Committee appointed by the Legislature - Awaiting outcome of report due to Legislature and Governor by December 1, 2010 	Legislative Study
Lake Columbia	35	<ul style="list-style-type: none"> - Designated Unique Reservoir Site - Reservoir Permitted - ANRA searching for Sponsors 	Hold
George Parkhouse	100	<ul style="list-style-type: none"> - Region C and D Study Committee appointed by the Legislature - Awaiting outcome of report due to Legislature and Governor by December 1, 2010 	Legislative Study
Oklahoma Water	100 +	<ul style="list-style-type: none"> - Negotiating agreement with TRWD to define relationship during lawsuit and settlement negotiations 	Interlocal Agreement Negotiations

Additional New Alternatives

Progress Report

Water Management Strategies	Projected Supply (MGD)	Progress	Project Status
Lake Ray Hubbard Yield Increase	67	<ul style="list-style-type: none">- Dallas filed a water right amendment with TCEQ for additional yield in Lake Ray Hubbard (27 to 67 MGD)- Application has been declared administratively complete by the State- Notice is projected to be published week of October 12	Permitting
Conjunctive Use	TDB	<ul style="list-style-type: none">- Ideas being considered	Conceptual

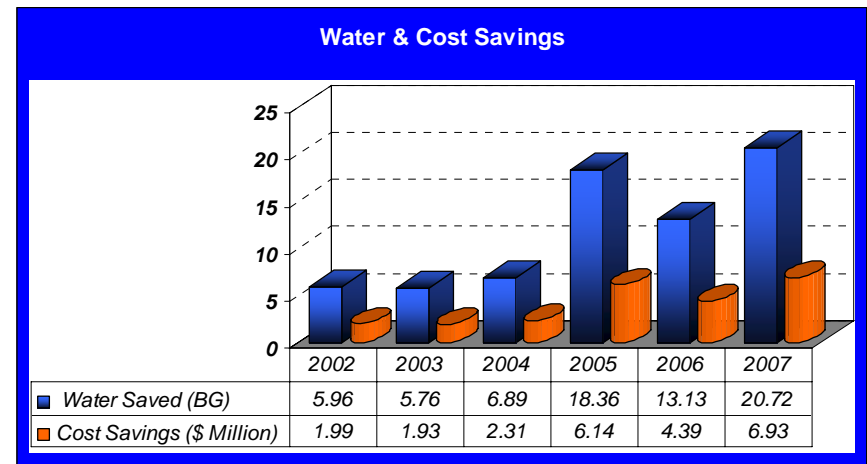
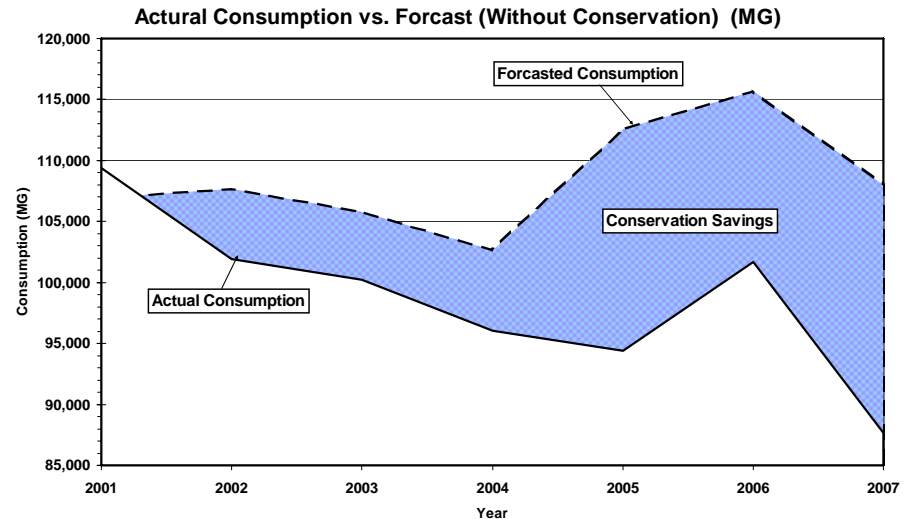
Dallas' Current and Proposed Reservoirs



Dallas has water rights in 7 lakes, 2 (light blue) are unconnected. The 2 reservoirs (purple) are in the Long Range Water Supply Plan. The dates in parentheses are the dates the lakes were completed.

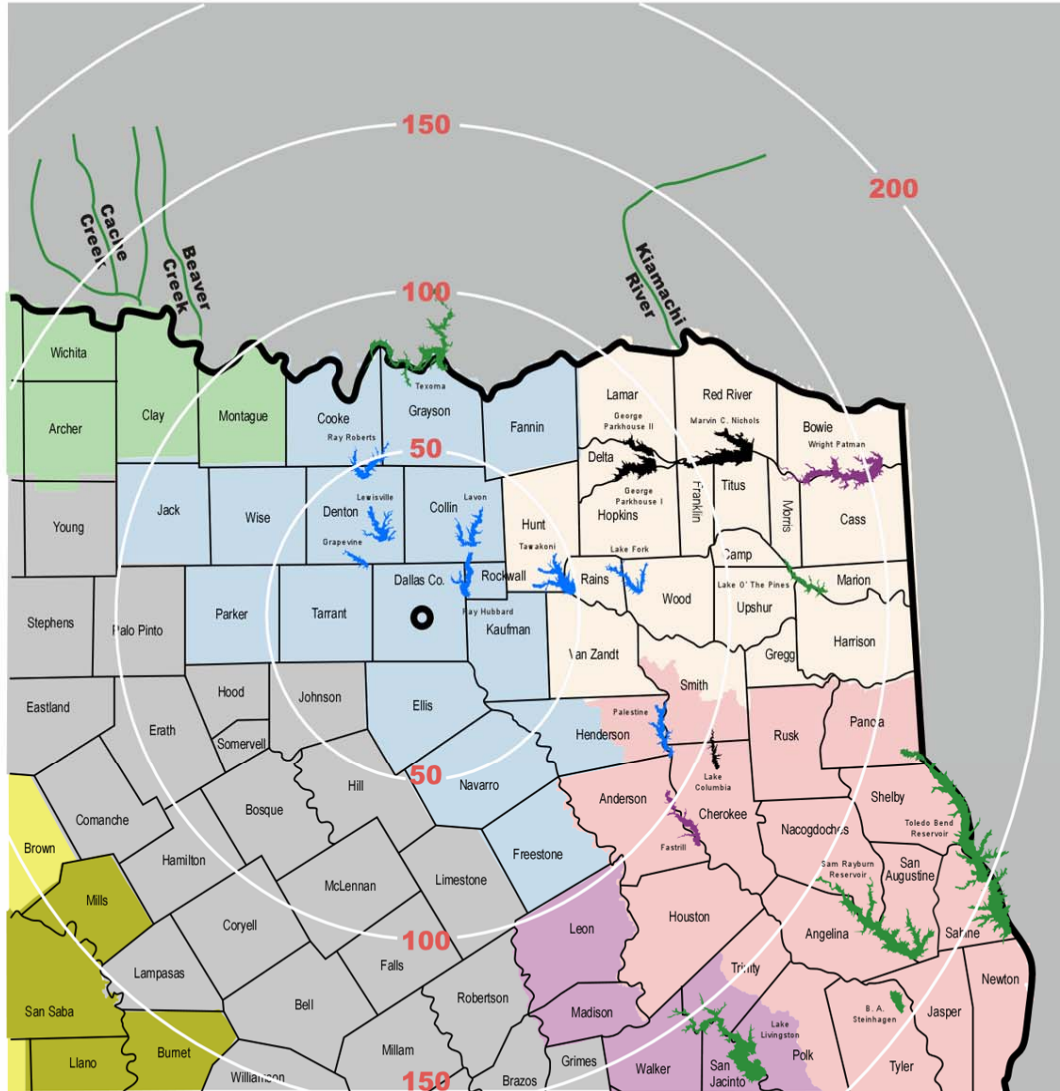
Conservation Efforts

- Dallas continues to aggressively pursue conservation strategies
 - Time-of-day watering restrictions extended from April 1 to October 31 annually
- State Updates & Five-year Plan Revised
 - November 2008
 - Agenda item to hire consultant to help update plans
 - State requires Conservation and Drought Contingency Plans by May, 2009
 - Agenda item to hire consultant to help update Five-year Strategic Plan
 - Review and revise Plan (2009-2014)
- Rebate & Incentive Programs
 - November 2008
 - Agenda item to expand ICI programs
 - Rebates for soil moisture sensors and high efficiency sprinkler heads
 - Expand toilet/urinal replacement efforts to include hotels, schools, office complexes



- 70 billion - gallons saved between 2002 and 2007
- \$3 million - annual costs of implementing conservation program
- \$6 million - annual savings related to implemented conservation measures
- \$1 invested = \$2 savings in operational costs

Dallas' Alternative Strategies



LAKES LEGEND

- Existing Dallas Reservoir (7)
- Proposed Dallas Reservoir (2)
 - 1 reservoir to be constructed
 - 1, an expansion of existing reservoir
- Alternate Dallas Strategy (7) (existing reservoirs)
- Alternate Dallas Strategy (4) (non-existing reservoirs)

Previously Identified Alternative Water Strategies for Dallas

- Alternate strategies within 100 miles
 - George Parkhouse I and II (not yet built) 100 MGD
 - Marvin Nichols (not yet built) 100 MGD
 - Lake Texoma 100 MGD
- Alternate strategies within 150 miles
 - Lake Columbia (not yet built) 32 MGD
 - Oklahoma water 100 MGD
 - Lake O' the Pines 80 MGD
- Alternate strategies within 200 miles
 - Toledo Bend Reservoir 100-200 MGD
 - Lake Livingston Reservoir 100 MGD
 - Sam Rayburn/B. A. Steinhagen 100 MGD
- Alternate strategies within 300 miles
 - Ogallala (Mesa) water 100-200 MGD

Additional detail in the Appendix

Alternative Strategies within 100 Miles

- George Parkhouse I and II (located in the Sulphur River Basin and not yet built) - 100 MGD
 - These 2 proposed reservoirs were not included in the State's list of recommended reservoirs, therefore unlikely to be built
 - Comment – not a recommended alternative strategy at this time
- Marvin Nichols (located in the Sulphur River Basin and not yet built) - 100 MGD
 - Included in the State's recommended reservoir list
 - Still much controversy surrounding the lake
 - Comment – not a recommended alternative strategy at this time
- **Lake Texoma - 100 MGD**
 - All of Texas' municipal water in Texoma has been allocated
 - Additional municipal water would require congressional action
 - Some water may be available from NTMWD, but high salt content
 - **Comment – pursuing feasibility as a possible alternative strategy**
- **Lake Ray Hubbard – Total MGD yet to be determined**
 - **Comment – pursuing as a primary strategy**

Alternative Strategies within 150 Miles

- Lake Columbia (not yet built) - 32 MGD
 - Included in the State's list of recommended reservoirs
 - Relatively small reservoir, but near to Lake Palestine
 - Comment – not a recommended alternative strategy at this time
- **Oklahoma water - 100 MGD**
 - Tarrant Regional Water District recently filed a lawsuit against Oklahoma and Oklahoma's moratorium until 2011 on water sales outside of their state
 - May be possible to partner with other Dallas area water providers to access Oklahoma water
 - Comment – Under review
- **Lake O' the Pines - 80 MGD**
 - Met with the Northeast Texas Municipal Water District on purchasing water in Lake O' the Pines
 - More than 60 MGD may be available, but will require additional study by the Corps of Engineers
 - Potentially part of the SRA Toledo Bend Phased Implementation Proposal
 - **Comment – pursuing feasibility as a possible alternative strategy**

Alternative Strategies within 200 Miles

- **Toledo Bend Reservoir - 100-200 MGD**
 - Large existing reservoir; in same river basin as Tawakoni and Fork
 - Due to distance, may require other partners to share in cost
 - Because of other lakes in the basin, may be opportunities to reduce cost
 - Discussed preparing a Phased Implementation Proposal with SRA
 - **Comment – pursuing feasibility as a possible alternative strategy**
- **Lake Livingston - 100 MGD**
 - Located in the Trinity River Basin, same as Dallas
 - Due to distance and cost, may require other partners to pursue
 - Water source used by Houston, may face resistance to obtaining water
 - Comment – not a recommended alternative strategy at this time
- **Sam Rayburn/B. A. Steinhagen – 100 MGD**
 - No water is available in Sam Rayburn due to electrical generation
 - After water is released, flows through B. A. Steinhagen and may be available
 - Due to distance and cost, would likely need partner to pursue
 - Comment – not a recommended alternative strategy at this time

Alternative Strategies within 300 Miles

- Ogallala (Mesa) water – 100-200 MGD
 - Underground water from the Ogallala aquifer
 - Price of water is very expensive
 - Have reviewed several proposals from Mesa regarding the water, with talks ongoing
 - May face some controversy since moving the water from arid West Texas
 - Comment – requires additional analysis to evaluate feasibility, but not a recommended alternative strategy at this time

Recommended Alternative Water Supply Strategies for Dallas - Ranked

<u>Primary Alternative Strategies</u>	<u>Amount (MGD)</u>	<u>Capital/ Source Cost (Mil)</u>	<u>Capital/ Conveyance Cost (Mil)</u>	<u>Annual O&M Cost (Mil)</u>	<u>Pre-Amort Costs/1000 gals</u>	<u>Post-Amort Cost/1000 gals</u>
Lake Ray Hubbard Additional Yield	TBD	\$ 2.00	\$ -	\$ 0.20	\$ 0.02	\$ 0.02
Sabine River Basin - Toledo Bend <i>(may include Lake 'O the Pines in Phased Implementation Proposal)</i>	179	\$ -	\$ 1,715.4	\$ 32.3	\$ 2.40	\$ 0.49
Lake O' the Pines (may be included in Toledo Bend Phased Implementation Proposal)	80	\$ -	\$ 490.9	\$ 12.0	\$ 1.63	\$ 0.41
Lake Texoma (includes addtl treatment)	100	\$ 300.0	\$ 129.6	\$ 34.9	\$ 1.82	\$ 0.97
Total	359					
<u>Other Alternative Strategies</u>						
Oklahoma water (pending outcome of Federal lawsuits)	100		\$ 494.6	\$ 11.8	\$ 1.81	\$ 0.33
Ogallala groundwater (Mesa)*	179	\$ 739.3	\$ 964.6	\$ 38.6	\$ 2.71	\$ 0.59
Lake Columbia	40	\$ 73.8	\$ 73.1	\$ 3.2	\$ 0.95	\$ 0.22
George Parkhouse I and II	100	\$ 206.4	\$ 239.5	\$ 10.4	\$ 1.22	\$ 0.85
Marvin Nichols	100	\$ 89.2	\$ 293.6	\$ 12.1	\$ 1.11	\$ 0.33
Lake Livingston	100	\$ -	\$ 706.8	\$ 16.5	\$ 1.86	\$ 0.45
Sam Rayburn/B.A. Steinhagen	100	\$ -	\$ 1,287.6	\$ 22.4	\$ 3.18	\$ 0.61
Total	719					

*Ogallala water does not include a Risk Recovery Fee that Mesa will likely charge.

- Recent news reports state that Mesa Water and the Roberts County Freshwater Supply District suspended plans to pipe water from beneath Roberts County to a major city with water shortfall.

Risk Management

- Our plan is designed to meet a 7 year drought of record
- Assumption of plan is that we will run out of water at the end of the 7th year, and then we will have rain that will refill reservoirs starting the next day
- Risks concerning water supply include:
 - Long lead time to acquire and connect new water source
 - Changes in weather patterns, population growth, local economy, natural disasters, and catastrophic events

Challenges to Water Supply Strategies

- Competing land uses
- Competition for water supply
- Impact of other State and Federal agencies
- Environmental flows
- Required coordination with other agencies and approval process
- Permitting delays
- Costs