

Memorandum



DATE September 27, 2007

TO Honorable Mayor and Members of the City Council

SUBJECT The Path to 2060 and Beyond - Dallas' Water Plan Update – Water Utilities Department

Attached is a briefing that will be presented to the Council on Wednesday, October 3, 2007, which will provide an update on the status of the City's long range water supply strategies to the year 2060.

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



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Assistant City Manager

Attachment

c: Mary K. Suhm, City Manager
Deborah Watkins, City Secretary
Thomas Perkins, City Attorney
Craig D. Kinton, City Auditor
Judge Jay Robinson
David K. Cook, Chief Financial Officer
Ryan S. Evans, First Assistant City Manager
Charles W. Daniels, Assistant City Manager
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Purpose of Briefing

- Provide information on Dallas' existing and alternative water supply strategies to meet the City of Dallas' water needs to the year 2060 and beyond

Outline

- Dallas' Current Water Supply Strategies
- Possible Alternative Water Supply Strategies
- Recommended Alternative Strategies
- Summary and Next Steps
- Appendix



Executive Summary

- While ensuring adequate water supply, minimizing costs to our customers has been a guiding principle
- Generally close-in sources are the least expensive
- Dallas projected water supply in 2060 is 1040.57 MGD—80 percent of this need can be reasonably met by current strategies
 - Dallas is reasonably assured of 840.57 MGD by 2035
 - After 2035, Dallas has a 200 MGD water supply requirement that is yet to be secured
 - Dallas is actively pursuing Fastrill and the Wright Patman floodpool reallocation as well as alternative strategies to meet this requirement
 - 25% of future water requirements will be met by conservation and reuse
- Dallas is partnering with other regional water providers to reduce costs of future water supplies

Dallas' Current Water Supply Strategies

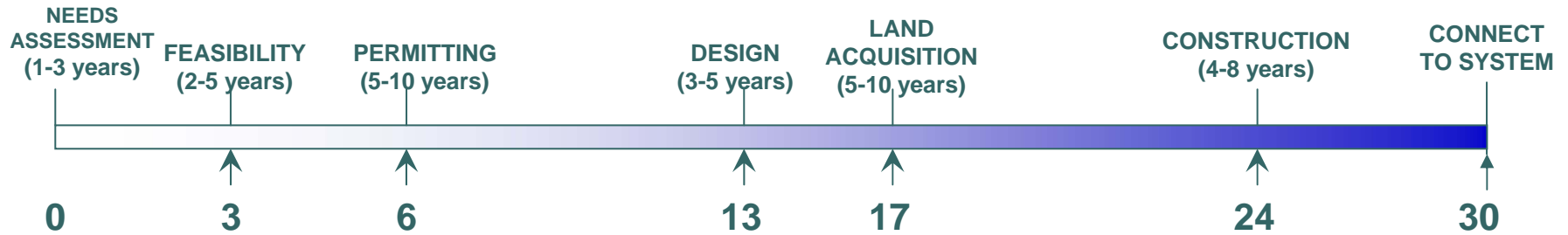
Planning Guidelines

- Dallas' ranking for planned new water supply sources has been based on:
 - Costs – capital construction and power
 - Efficiency
 - Environmental impact
 - Likelihood for development
- Water located closer to the City is generally less expensive
 - Lower infrastructure costs due to shorter pipelines
 - Lower pumping (energy) costs—a recurring, annual expense
- Dallas is included in Region C as part of the Statewide water planning effort
- Working with other area water providers to achieve greater economies of scale and thus reduce costs

Components of Water Supply Planning



New Water Source Timeline Examples



- Lake Ray Roberts took 25 years to build
 - The U.S. Congress authorized construction in 1965
 - Permits granted in June 1976
 - In June 1987, the gates of the dam were closed
 - The reservoir filled in May 1990
- Lake Fork, existing source, was acquired in 1981
 - Total time will be 28 years to connect to Dallas' system
 - City paid debt service until 2005
 - Right of way acquisition began in the late 1980s, construction of pipeline and pump station began in October 2000
 - Projected time for construction to be completed is January 2009
 - Additional capital expenditures will be needed to allow Dallas to fully utilize the Lake Fork water

State Water Planning Effort

- Senate Bill 1 passed by the 1997 Legislature
- Spurred by 1996 drought
- “Bottom Up” water planning process, with a report every 5 years
- Texas Water Development Board
 - Adopted water planning rules
 - Set out 16 regions for planning
 - **Dallas is in Region C**
- The State of Texas has just begun the third round of regional planning, with the report to be issued in January 2012



State of Texas Legislative Activities

- Legislative Session ended May 28, 2007
- SB 3, HB 3 and HB 4 passed into law, containing overarching provisions regarding Environmental Flows and Water Conservation
 - Environmental Flows Advisory Group to be appointed with 3 Senators, 3 Representatives, and TCEQ, TWDB, and TPWD
 - Environmental Flows stakeholder committees for priority river basins (includes Trinity, Sabine and Neches Rivers) to be appointed by November 1, 2007
 - Water Conservation Advisory Council to monitor the development and implementation of water conservation strategies in regional water plans has been appointed
- 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
 - 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 Dec 1, 2010

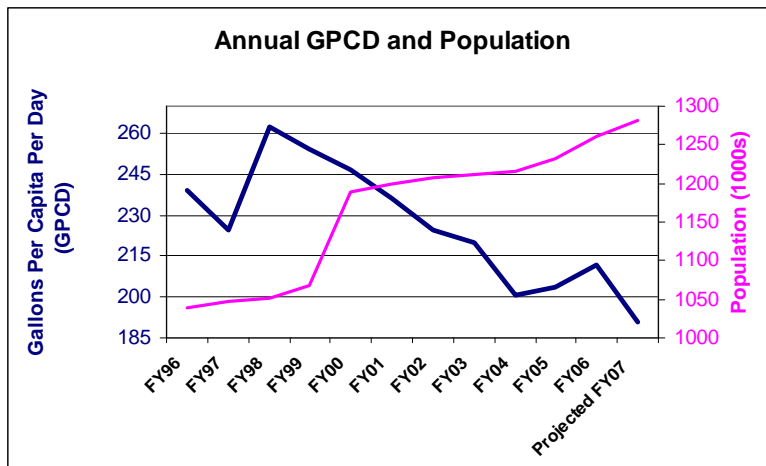
Current Dallas Water Supply Strategies

(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

Conservation Efforts



- Dallas continues to aggressively pursue conservation strategies
 - Time-of-day watering restrictions extended from April 1 to October 31 annually
 - Previously, time-of-day watering restrictions were June 1 – Sep 30 annually
 - Council approved toilet rebate program in April 2007
- 25% of future water requirements will be met by conservation and reuse
- Conservation measures adopted by the Council in Oct 2001 have been positive
 - Dallas saved an estimated 44 billion gallons of water since 2001
 - GPCD has been reduced approximately 27% from FY98 to FY07
 - As a result, Dallas has been able to mitigate the impact of recent drought weather conditions on water supply

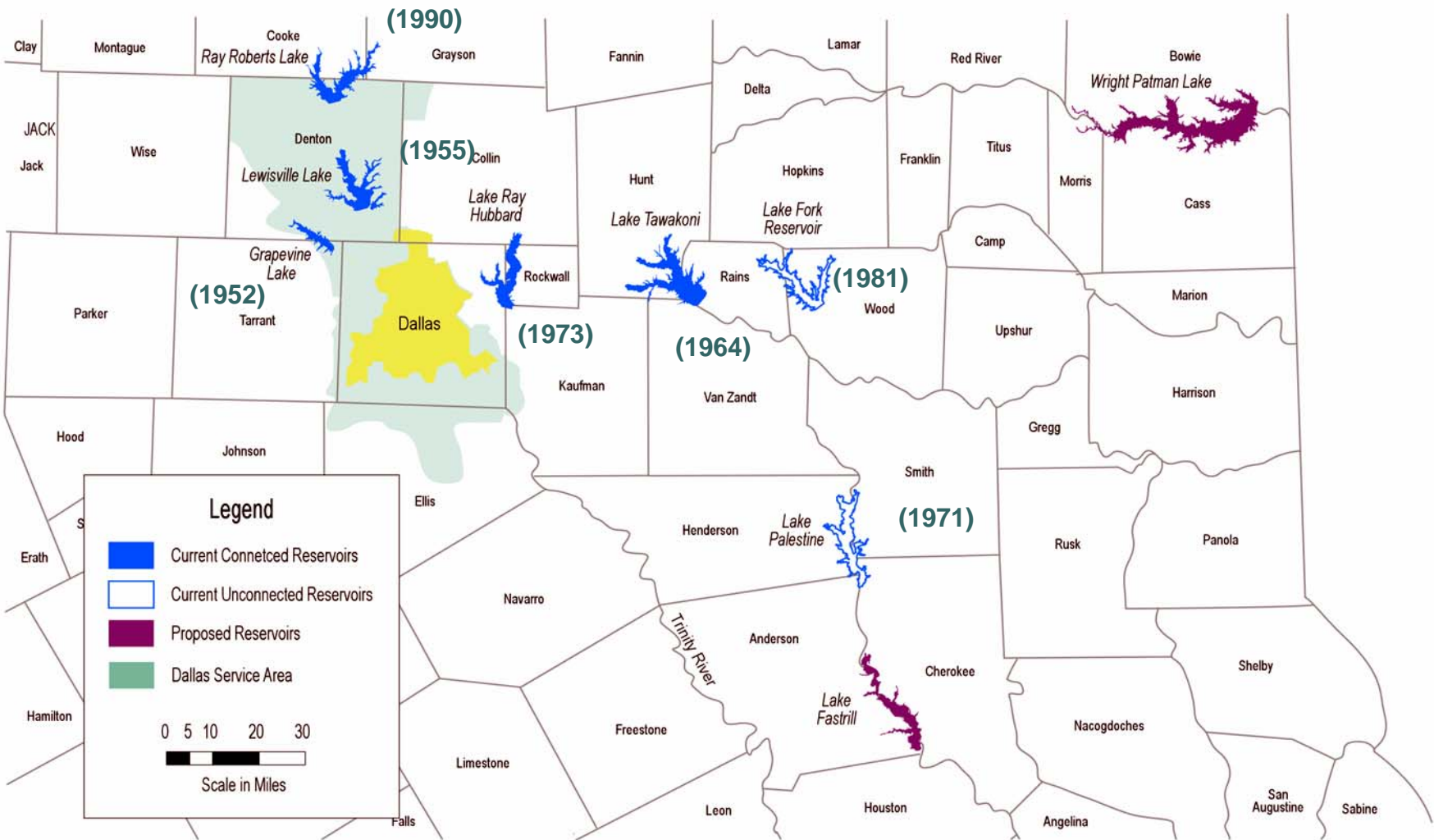
Risk Management

- 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

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.

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

Current Actions Underway on the Path to 2060

- 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
- 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
- Negotiating for 24 MGD of reuse water for Lake Ray Hubbard, with a goal to complete by late 2008

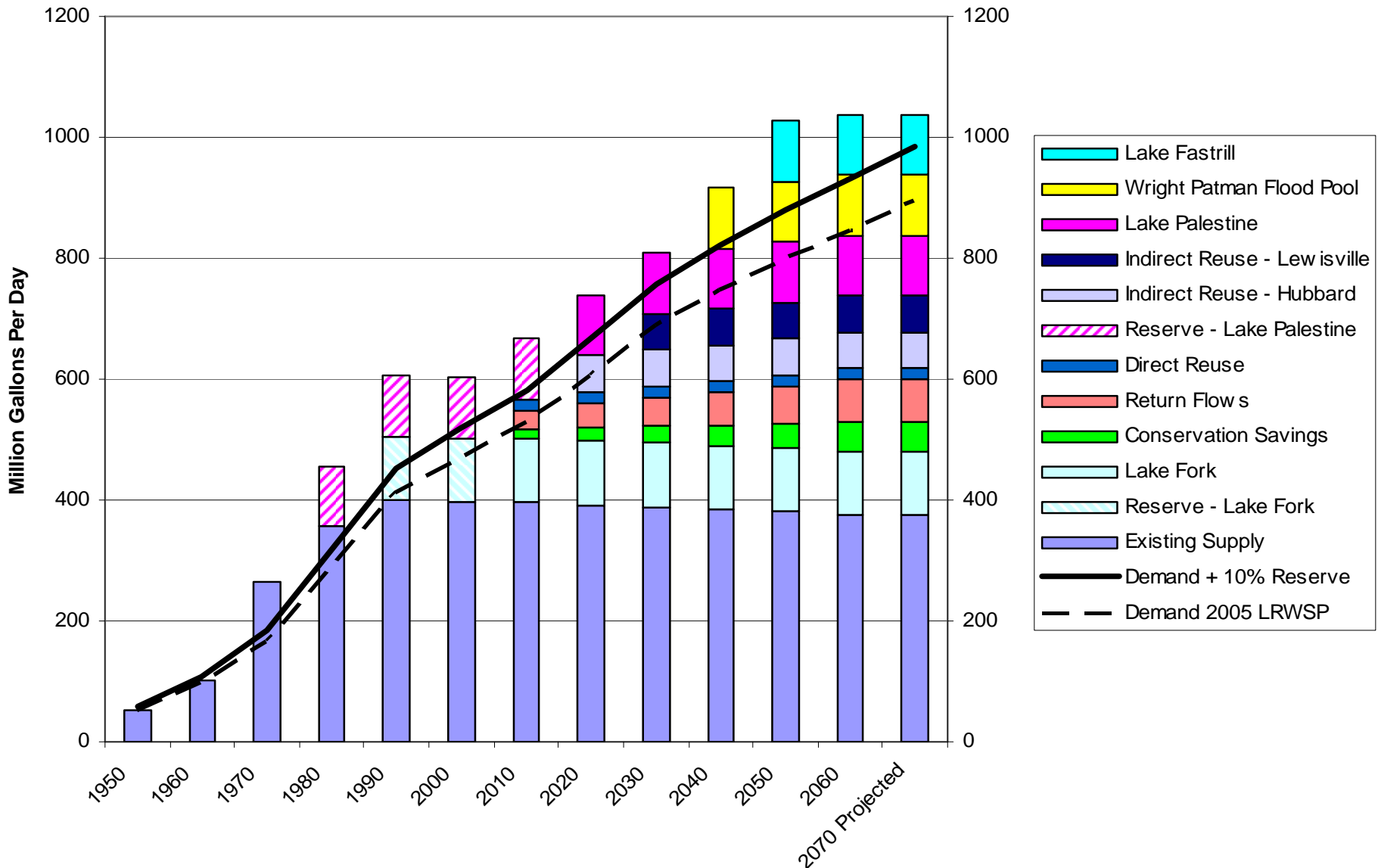
Current Actions Underway on the Path to 2060 (cont'd)

- 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
- 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

Newly Identified Strategy - Lake Ray Hubbard

- 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

Recommended Water Management Strategies for Dallas Water Utilities



Dallas' water supply barely met demand in 1950, and failed to meet demand during the 1950s' drought. As shown, it took several decades to "catch up" where water supply exceeded demand.

Estimated Costs for Major Water Supply Projects

- Additional capital expenditures are needed to fully utilize existing water resources
- These costs will continue to drive future rate increases
- Capital costs are shown in the table below:

<u>Major Project</u>	<u>FY08-FY10</u>	<u>FY11-FY15</u>	<u>FY16-FY22</u>	<u>Total</u>
Eastside Water Treatment Plant (ESWTP) to SW Dallas pipeline	\$ 92.0	\$ 135.0	\$ -	\$ 227.0
New LF/Tawakoni pipeline, Expand Balancing Reservoir	\$ 2.2	\$ 213.5	\$ 187.0	\$ 402.7
New SE/SW Water Treatment Plant	\$ -	\$ 18.0	\$ 94.0	\$ 112.0
Lake Palestine Connection	\$ 4.2	\$ 17.5	\$ 692.4	\$ 714.1
Total	\$ 98.4	\$ 384.0	\$ 973.4	\$1,455.8

Regional Cooperation

- Dallas water rights were obtained based on serving the needs of Dallas and its customer cities (wholesale customers)
- Dallas shares costs with our customer cities and has had a successful relationship with these cities for more than 50 years
- Both Dallas and customer cities enjoy lower water rates because of a regional approach to water acquisition and supply
- The Memorandum of Agreement that defines how Dallas recovers its costs from the customer cities is slated for renegotiation in 2009
 - Agreement has been in place since 1979, and has a 30 year term
 - The renegotiation process will include a review of the existing rate methodology, and incorporate any agreed upon changes by Dallas and the customer cities
 - Dallas has retained an expert with the firm HDR to assist us in this process
- Dallas and other area water agencies looking to 2060 for possible water sources
 - Regional approach for new water sources
 - Funding for new water sources is more cost effective when it is a collaborative effort
 - Examples of cooperation include water resources from the Sulphur River Basin, Toledo Bend, Oklahoma water, and reuse

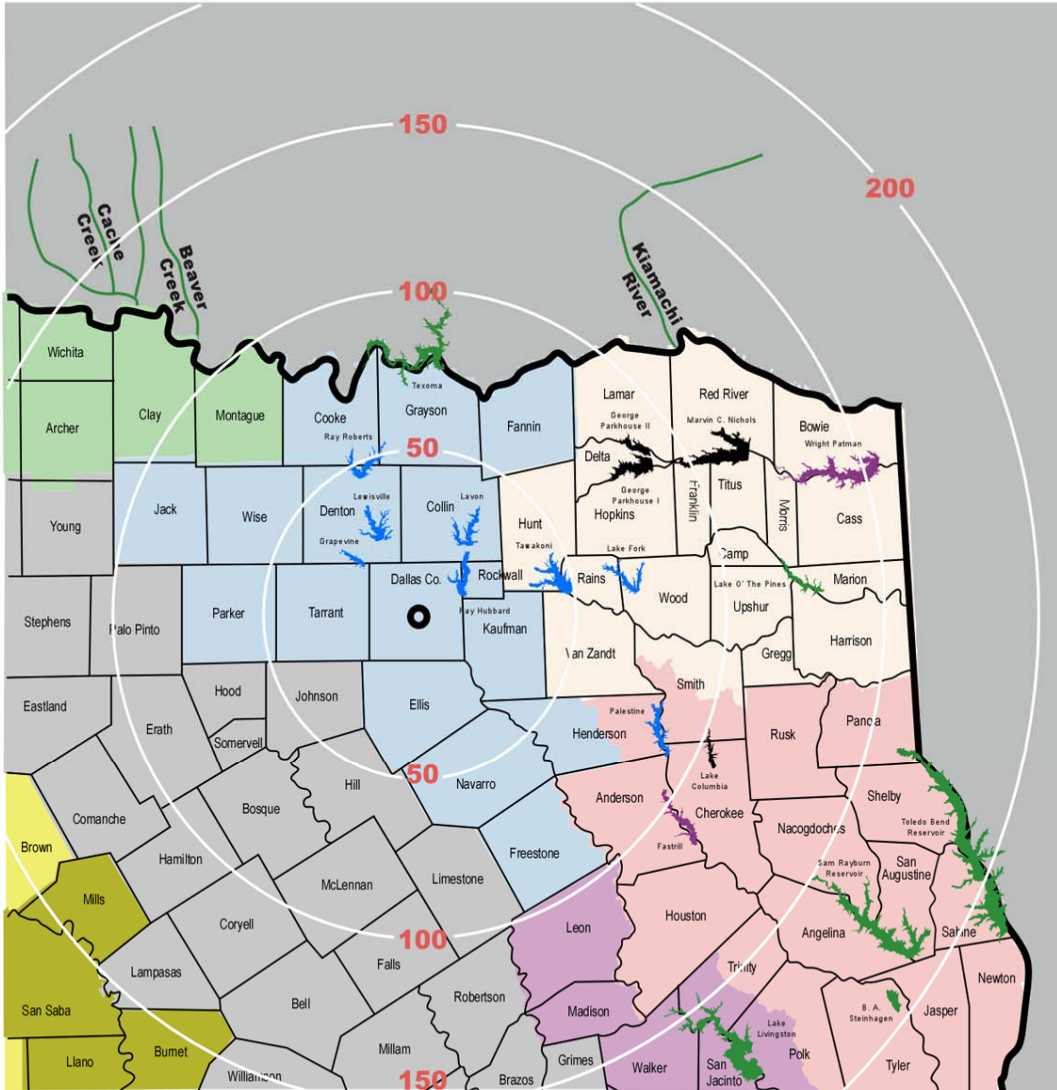
Dallas' Actions with Other Entities - Metroplex

- Tarrant Regional Water District
 - Council approved study of possible sharing cost of water transmission this year
 - Provides the framework for increasing the reliability of water supplies for Dallas
 - Provides the ability for Dallas to obtain interim and emergency water supplies
- North Texas Municipal Water District
 - Talks are underway to share the cost of reclaimed water transmission
 - Provides the framework for possible interim sale of water
 - Provides for reciprocal connections for emergencies
- Trinity River Authority
 - TRA treats a portion of Dallas' wastewater currently
 - Discussions underway on Lake Ray Hubbard permit, and Joe Pool Lake possibilities

Dallas' Actions with Other Entities – East Texas

- Sabine River Authority
 - Water reservoirs include Lake Tawakoni, Lake Fork, and Toledo Bend
 - In negotiations for the price for Lake Fork water in 2014
 - Developing agreements for SRA to provide right of way maintenance, security and emergency operations of the Lake Fork pump station and pipeline
 - Dallas may provide transmission of SRA water from Lake Fork to Lake Tawakoni
 - Final agreements may include water from Lake O' the Pines
- Upper Neches River Municipal Water Authority
 - Water reservoirs include Lake Palestine and proposed Lake Fastrill
 - Worked with Upper Neches on Lake Fastrill feasibility study, with additional engineering work for alternative wildlife refuge sites
 - Possible agreement to manage Lake Palestine pump station and pipeline construction
- Northeast Texas Municipal Water District
 - Water reservoirs include Lake O' the Pines
 - May be a possibility to obtain water from this lake
- Sulphur River Basin Authority
 - Council approved Dallas to participate in the Sulphur River Basin study in April 05
 - Our participation requires a contract with the Sulphur River Basin Authority, and we have not yet been able to agree to the proposed terms of the contract

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 Water Strategies Being Pursued

- Alternate strategies within 100 miles
 - Lake Ray Hubbard 27+ MGD
 - Lake Texoma 100 MGD
- Alternate strategies within 150 miles
 - Lake O' the Pines 80 MGD
- Alternate strategies within 200 miles
 - Toledo Bend Reservoir 100-200 MGD

Summary and Next Steps

Summary

- While assuring adequate water supply, minimizing costs to our customers has been a guiding principle
 - The Memorandum of Agreement between Dallas and our customer cities that governs the rate setting methodology ends in 2009, and is in the renegotiation process
- Dallas is pursuing multiple alternative strategies to meet the water needs to the year 2060 and beyond, including significant conservation and reuse
 - Dallas' projected water supply in 2060 is 1040.57 MGD; 80 percent of this need can be reasonably met by current strategies to the year 2035
 - After 2035, Dallas has a 200 MGD water requirement that is yet to be secured
 - Dallas is partnering with other regional water providers to reduce costs of future water supplies
- Staff plans to seek assistance to develop a Reservoir Optimization model that will minimize costs to operate our system as we add more and diverse water supply sources

Next Steps

- Staff will continue to:
 - Move forward on the Lake Ray Hubbard application
 - Anticipate permit decision in 2009
 - Pursue Lake Fastrill and Wright Patman water strategies
 - Additional information on feasibility in 2008
 - Research challenges, meet with other entities, update costs, and finalize alternative strategies

Alternate Strategy

Timeframe

- Toledo Bend/Lake O' the Pines
- Lake Texoma

2008/09

2008/09

- Remain an active participant in upcoming regional planning efforts as well as monitoring and participating in the State's Environmental Flows and Water Conservation activities

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.