NORTH TEXAS MUNICIPAL WATER DISTRICT

EAST FORK RAW WATER SUPPLY PROJECT

Denise Hickey
Agenda

- NTMWD Background
- Water Planning
- East Fork Raw Water Supply Project Overview
- Benefits
- Nature Center
NTMWD BACKGROUND
NTMWD Treated Water Service Area

• **13 Member Cities**
  - Allen
  - Farmersville
  - Forney
  - Frisco
  - Garland
  - McKinney
  - Mesquite
  - Richardson
  - Plano
  - Princeton
  - Rockwall
  - Royse City
  - Wylie

• **49 Customer Cities, Towns, and Entities**
History of NTMWD

- 1956 - First Delivery of Treated Water
- 1970s - Expanded to Wastewater Service
- 1980s - Expanded to Solid Waste Service
WATER PLANNING
Regional Water Planning

16 areas identified by the letters A to P
Region C

- Region C represents the Metroplex and surrounding area
- All or part of 16 counties
- About ¼ of Texas’ population
- 90% of water use for municipal
- 90% is surface water
Figure ES.7
Sources of Water Available to Region C as of 2060

- Current Surface Supplies: 33%
- Connect Existing Sources: 26%
- Conservation and Reuse: 23%
- New Reservoirs: 15%
- Groundwater Supplies: 3%
Figure 4E.8
Recommended Water Management Strategies for North Texas Municipal Water District

<table>
<thead>
<tr>
<th>Year</th>
<th>Oklahoma</th>
<th>Toledo Bend Phase 1</th>
<th>Marvin Nichols</th>
<th>Additional Lake Texoma</th>
<th>Lower Bois d'Arc Creek Res.</th>
<th>Main Stem PS</th>
<th>Renewed Interim GTUA</th>
<th>Conservation (Wholesale Customers)</th>
<th>Upper Sabine Basin</th>
<th>Interim GTUA</th>
<th>East Fork Reuse</th>
<th>Lake Bonham</th>
<th>Wilson Creek Reuse</th>
<th>Lake Chapman</th>
<th>Lake Texoma</th>
<th>Lake Lavon</th>
<th>Currently Available Supplies - Losses</th>
<th>Projected Demands + Losses</th>
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<tbody>
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Projected Water Needs

Lavon Lake Yield: 104,000 ac-ft/yr (93 MGD)

Next 5 Decades:
Equivalent of Additional Lavon Lake Yield for Every Decade
East Fork Raw Water Supply Project

- Authorization of Project by Board – Aug. 2003
- 81,000 - 102,000 ac-ft/yr
- Estimated Project Cost - $246 million
- Project Completed – 2009
East Fork Raw Water Supply Project Schematic

Major Existing/Proposed WWTP
Diversion Point
Future Transfer Pathway

Lake Texoma Inflow
Chapman Lake Inflow
Lavon Lake
Wilson Ck
Rowlett Ck
Muddy Ck
Duck Ck
South Mesquite Ck

Lake Ray Hubbard
Trinity River
Constructed Wetland

East Fork
Raw Water Supply
Project Schematic
East Fork Raw Water Supply Project Location

Lavon Lake

Lake Ray Hubbard

Constructed Wetland Project Site
East Fork Raw Water Supply Project

- 1,840 acre constructed wetland (largest in country)
- Provides polishing treatment of diverted East Fork Water
- Improves water quality
- Maximizing supplies during drought and while Texoma supplies off-line due to invasive species
Project Site Characteristics

- Wetland easement (2000 acres)
- East Fork of Trinity
- Direction of flow
- 1.4 miles
- 3.7 miles
- FM 3039
- US 175
Five Major Components

- Diversion Pump Station & Diversion Structure
- Constructed Wetland
- Conveyance Pump Station
- Electrical Substation
- Conveyance Pipeline & Outfall Structure
Diversion Pump Station  
& Diversion Structure
Diversion Structure

- Withdraws and lifts water from the East Fork of the Trinity River into the constructed wetland
Diversion Pump Station

- Pumps river water into the sedimentation basins
- 165 mgd
- Vertical turbine pumps
  - 2 - 250 HP
  - 2 - 500 HP
  - Future 500 Hp
Constructed Wetland
Constructed Wetland

- Sedimentation basins
  - 3 basins
  - average detention time 24 hours
  - Remove suspended solids

- Wetland cells
  - 24 cells
  - average detention time 7 to 10 days
  - Remove numerous constituents

- Shallow water depth: 12 inches– 18 inches

- Deepwater zone depth: 5 feet to 10 feet
Constructed Wetland

- Sedimentation Basins (3)
- North wetland cells (3)
- Central wetland cells (11)
- South wetland cells (10)
- Conveyance Pump Station
- Holding Pond
Constructed Wetland Plants

- Planted with more than 20 selected emergent wetland species
- Plant diversity achieves water treatment required
- Plant diversity also beneficial to wildlife
- Plant stock grown & propagated in on-site nursery
Structured Wetland Nurseries

Phase 1 Nursery
(Completed Oct. 2004)

18 acres
16,000 plant plugs
8 species
Planting Phase I - Area A (October 2004)
Phase 1 Nursery
18 acres
16,000 plant plugs
8 species

Phase 2 Nursery
190 acres
225,000 plant plugs
12 species

Full Scale Wetland
1,560 acres marsh area
1,800,000 plant plugs
16 species

(Begin planting Jan 2007)
Water Quality

Trinity River before treatment

Water after wetland treatment
Conveyance Pump Station
Conveyance Pump Station

- 150 mgd peak capacity
- 110 mgd interim capacity
- Vertical Turbine Pumps
  - 3 – 3000 Hp
  - 2 – future 6000 Hp
- Equipped with SCADA system
Electrical Substation
Electrical Substation

- Provides power to the Conveyance Pump Station
- Power is approximately 60% of annual operating budget
- Power supplied by Trinity Valley Electric Cooperative
- Incoming power 138 kV reduced to 5 kV
Conveyance Pipeline
Conveyance Pipeline

- Transfers polished water to outfall structure at Lavon Lake
- Pipeline divided into 3 segments
  - Northern
  - Central
  - Southern
- 84” diameter pipeline
  - Cement-mortar lined steel with polyurethane coating
  - Pipe protection is galvanic anode cathodic system
  - Joints have full circumferential internal welds
Conveyance Pipeline

- 43.5 miles long
- Travels north through Kaufman, Rockwall and Collin counties
- Construction included stream, railroad, highway, and utility crossings
## Easements Acquired

<table>
<thead>
<tr>
<th>East Fork Project - Conveyance Pipeline</th>
<th>Southern Segment - Kaufman County</th>
<th>Central Segment - Rockwall County</th>
<th>Northern Segment - Collin County</th>
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<tbody>
<tr>
<td>Total Easements Acquired by NTMWD</td>
<td>58</td>
<td>83</td>
<td>48</td>
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Total easements = 189
Outfall Structure
Lake Lavon Yield: 104,000 ac-ft/yr (93 MGD) + East Fork Water Supply Project: 102,000 ac-ft/yr (91 MGD) = Total Yield: 206,000 ac-ft/yr (184 MGD)
Project Benefits

- Use of a natural system to supply water to the region served by NTMWD
- Efficient use of resources
- Provides wildlife habitat that is a major environmental benefit
- Agency support
  - Texas Parks and Wildlife
  - Corps of Engineers
- Public acceptance
John Bunker Sands Nature Center
• Partnership
  – Rosewood
  – NTMWD

• Nature Center
  – $1.5 M Budget

• Baylor University research participant
John Bunker Sands Nature Center

Provides Water and Environmental Education & Research Opportunities
Contact Information:

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