The Interconnection of the East and West Bank Water Supplies

St. Charles Parish Department of Waterworks

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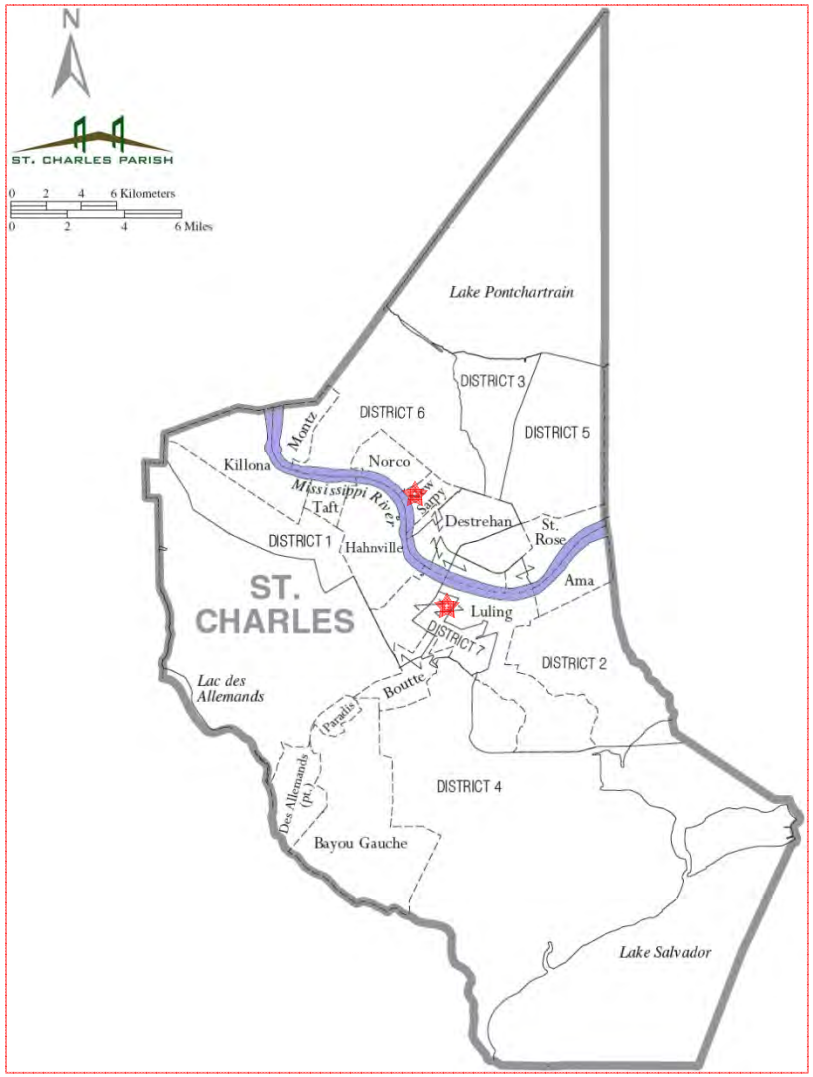

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St. Charles Parish Waterworks Districts

- Eastbank Waterworks District One
  - Created on November 17, 1949
- Westbank Waterworks District Two
  - Created on November 21, 1949
- Department of Waterworks
  - Created on November 6, 1989

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WATER TREATMENT CAPACITY

- **EastBank Production Capacity - 7 MGD**

A Plant Built in 1950 (1.5 MGD)
B Plant Built in 1965 (1.5 MGD)
C Plant Built in 1978 (4 MGD)

- **WestBank Production Capacity - 9 MGD**(+30%)

A Plant Built in 1950 (1 MGD)
B Plant Built in 1963 (2 MGD)
C Plant Built in 1973 (3 MGD)
D Plant Built in 1983 (6 MGD) 3 MGD Filter Capacity

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District #1 and #2 Consolidated November 1989

- Under the River Connection first conceived shortly after consolidation
  - Directional Boring & HDPE still new to water industry
  - Deemed Cost Prohibitive
- Last Expansion of the East Bank Production Facilities was completed in 1978.
  - "C-Plant" Responsible for more than ½ of Daily Water Demand on the East Bank of St. Charles
  - Could not be taken out of service for long enough to repair without running out of water (approx. 18 hrs)

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Katrina Effect

- Began Plant Expansion Engineering in 2003
- Hurricane Katrina caused extensive wind damage but no loss of water system
  - All leaks repaired in first weeks
  - No catastrophic flooding
  - Refugees from surrounding areas (60% increase on EB)
- Decide on two pronged approach to Capacity
  - Complete Design of Plant Expansion ($$$)
  - Interconnection of East and West Bank Water (120)

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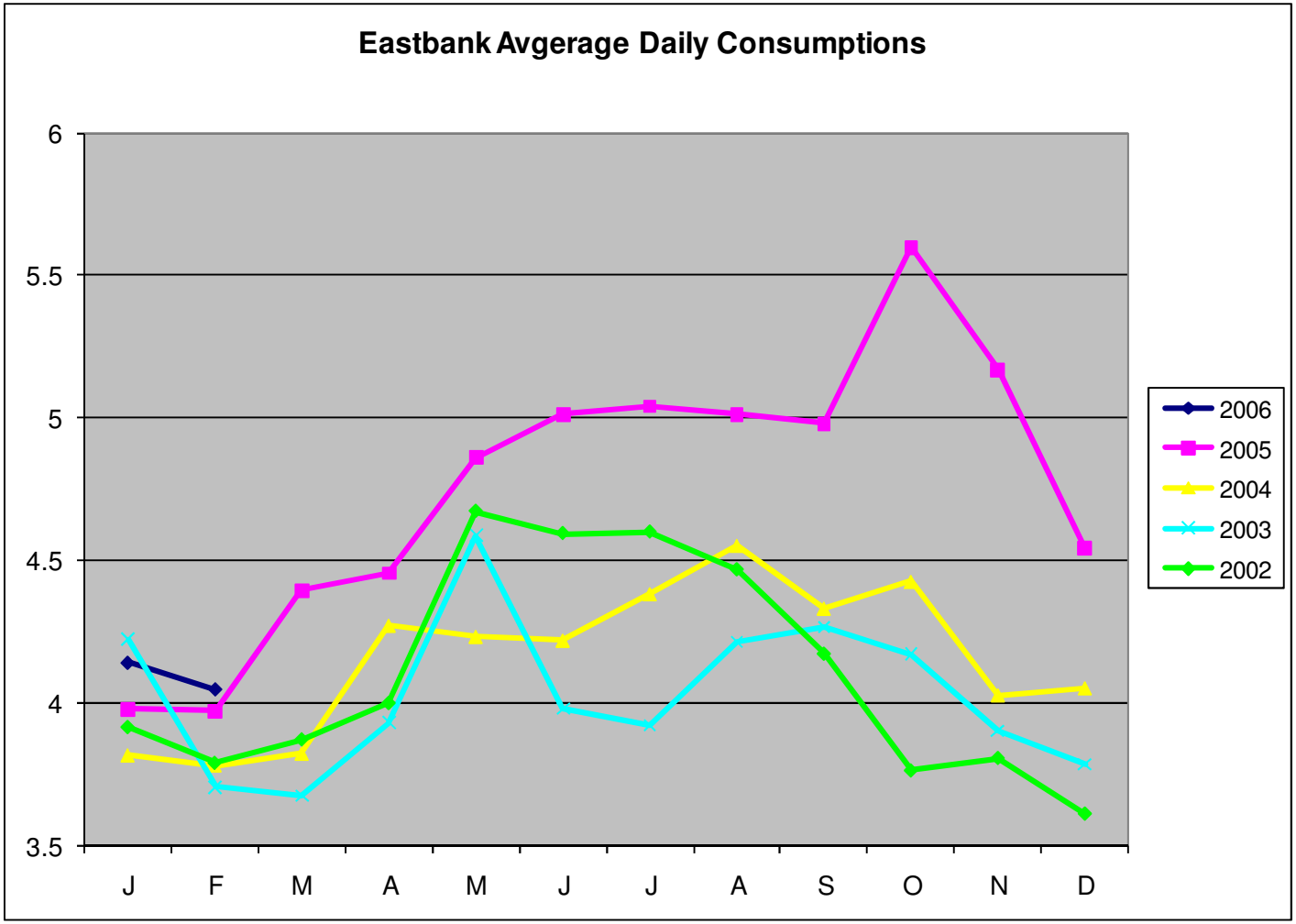
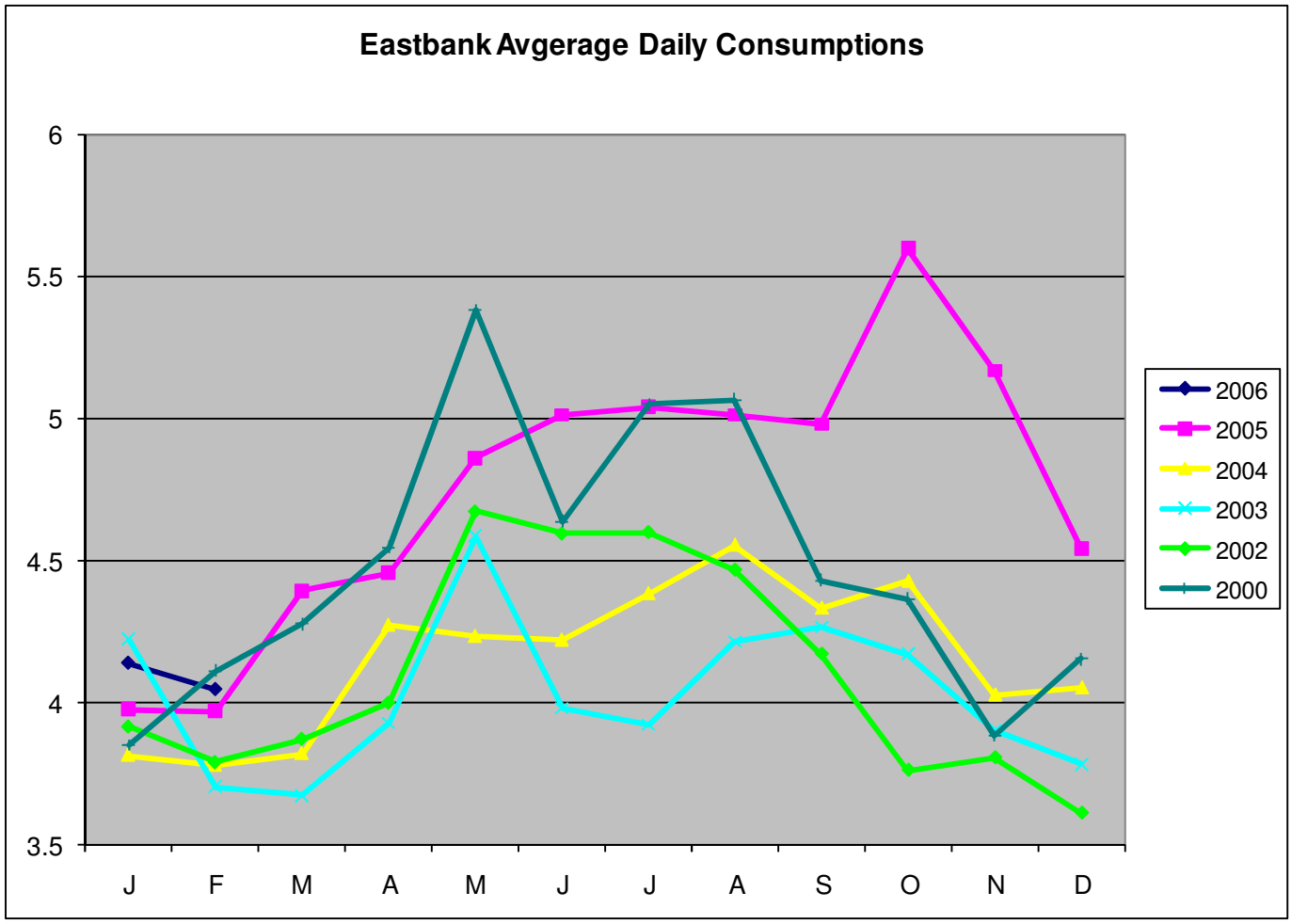
Water Consumption



Water Consumption



Water Consumption

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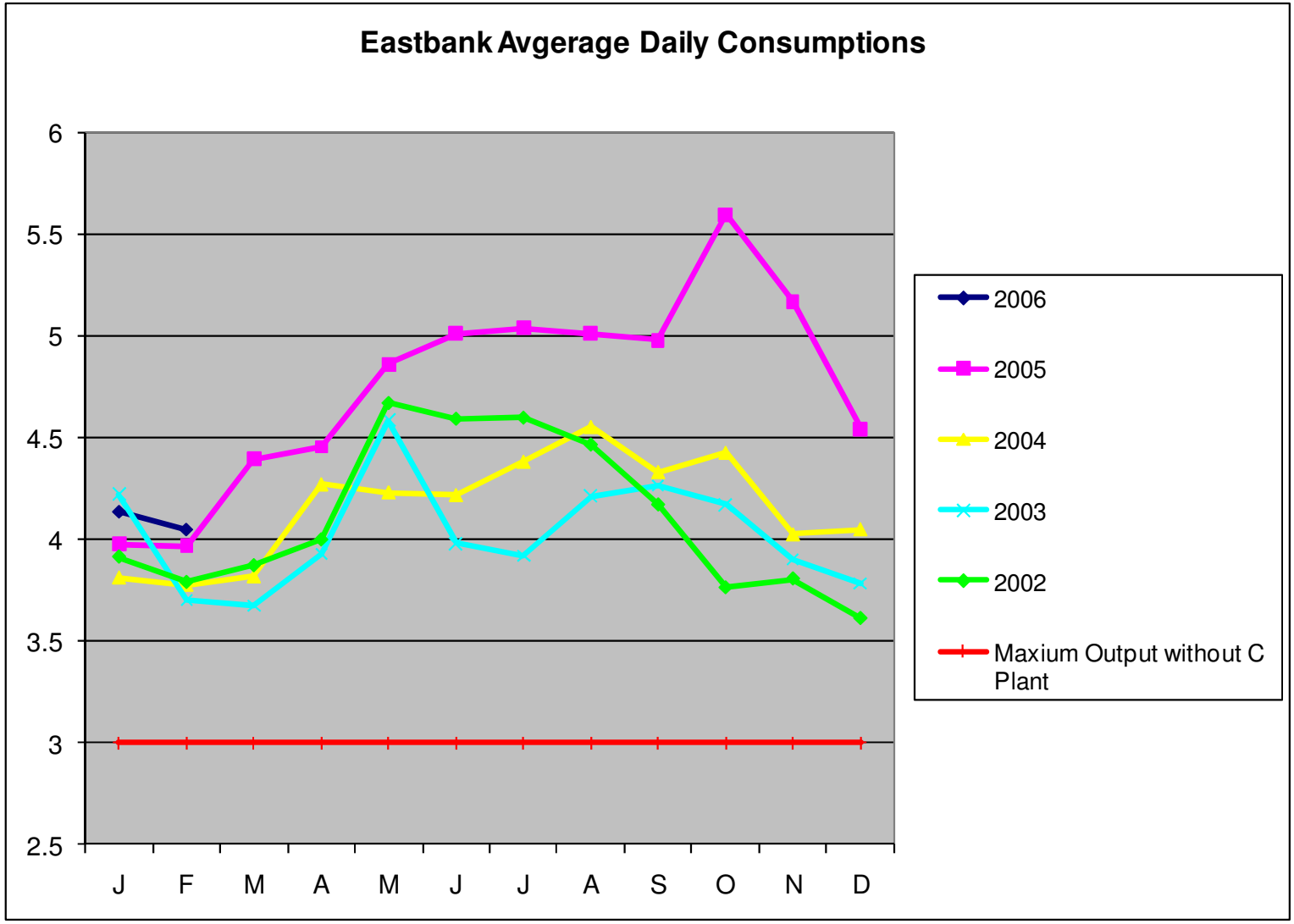

Design Criteria

- Proper Sizing of the Two Lines
  - Internal Pressures on Pipe –DR9 (150~156 lbs)
  - Over Burden Pressure (Service Load Condition 130 lbs)
  - Pulling Strength
- Proximity to Treatment Plant / Large Mains
  - Plants located 5 miles apart on river
  - #1 connected 16” EB main at Plant to 10” WB main
  - #2 connected 10” WB main to 12” EB main (16”WB south of UPRR)
- Sufficient Room for Layout
  - #1 - 3350 feet (.63 miles) #2 - 2957 feet (.56 miles)

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Design Criteria

- Levee Slope Stability Control Line / Batture
  - WB of Crossing #1 had batture > 1900 ft. (permitted)
  - 30 ft from Toe of Levee
  - 25 ft below River Bottom
- Landowners / Servitudes
  - Multiple Owners
  - Business Impact Mitigation
- Soil Conditions
  - Hydrographic Survey for River Bottom Profile
- Distance Across River / Crossing Angles
- Temporary Access Roads / Weight Loading on Levee

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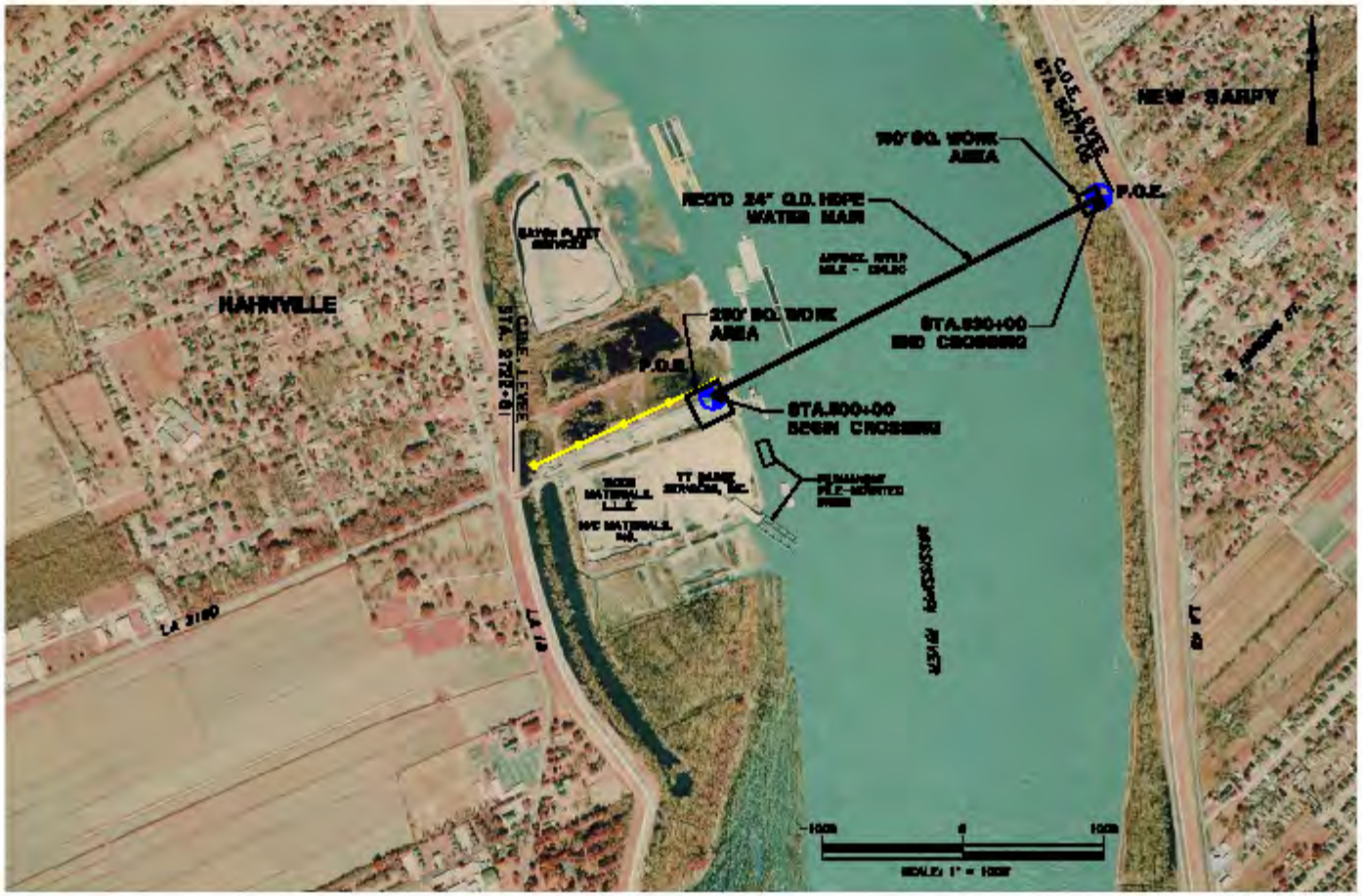
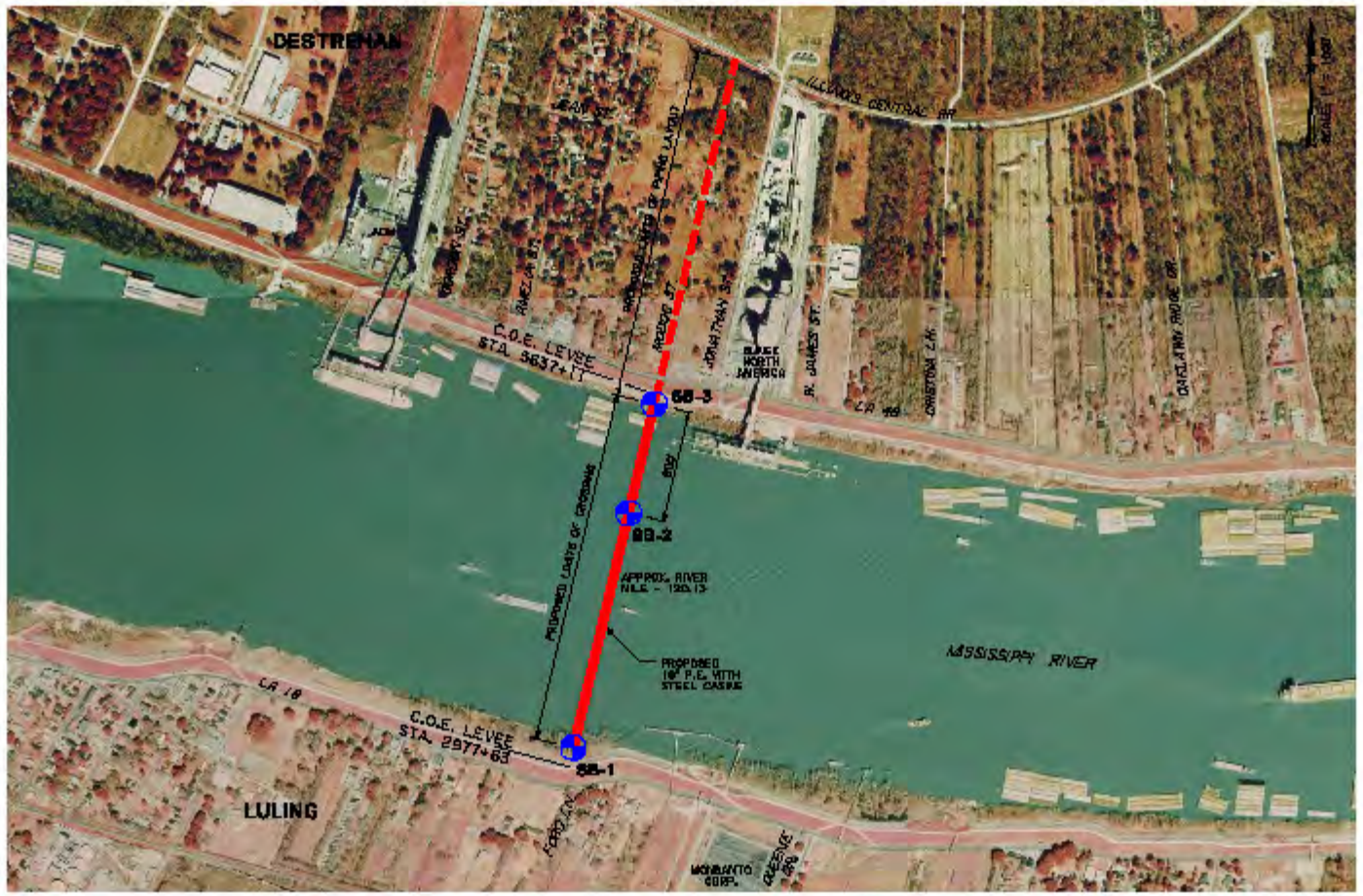


OCTOBER 2006

SHREAD-KUYRKENDALL & ASSOC. ENGINEERS-SURVEYORS-PLANNERS BATON ROUGE, LOUISIANA	ST. CHARLES PARISH SUB-AQUEOUS CROSSING NO. 1	VICINITY MAP ST. CHARLES PARISH, LOUISIANA



MAY 2006

SHREAD-KUYRKENDALL & ASSOC. ENGINEERS-SURVEYORS-PLANNERS BATON ROUGE, LOUISIANA	**MISSISSIPPI RIVER SUB-AQUEOUS CROSSING NO. 29**	**BORING SITE PLAN** **ST. CHARLES PARISH, LOUISIANA**

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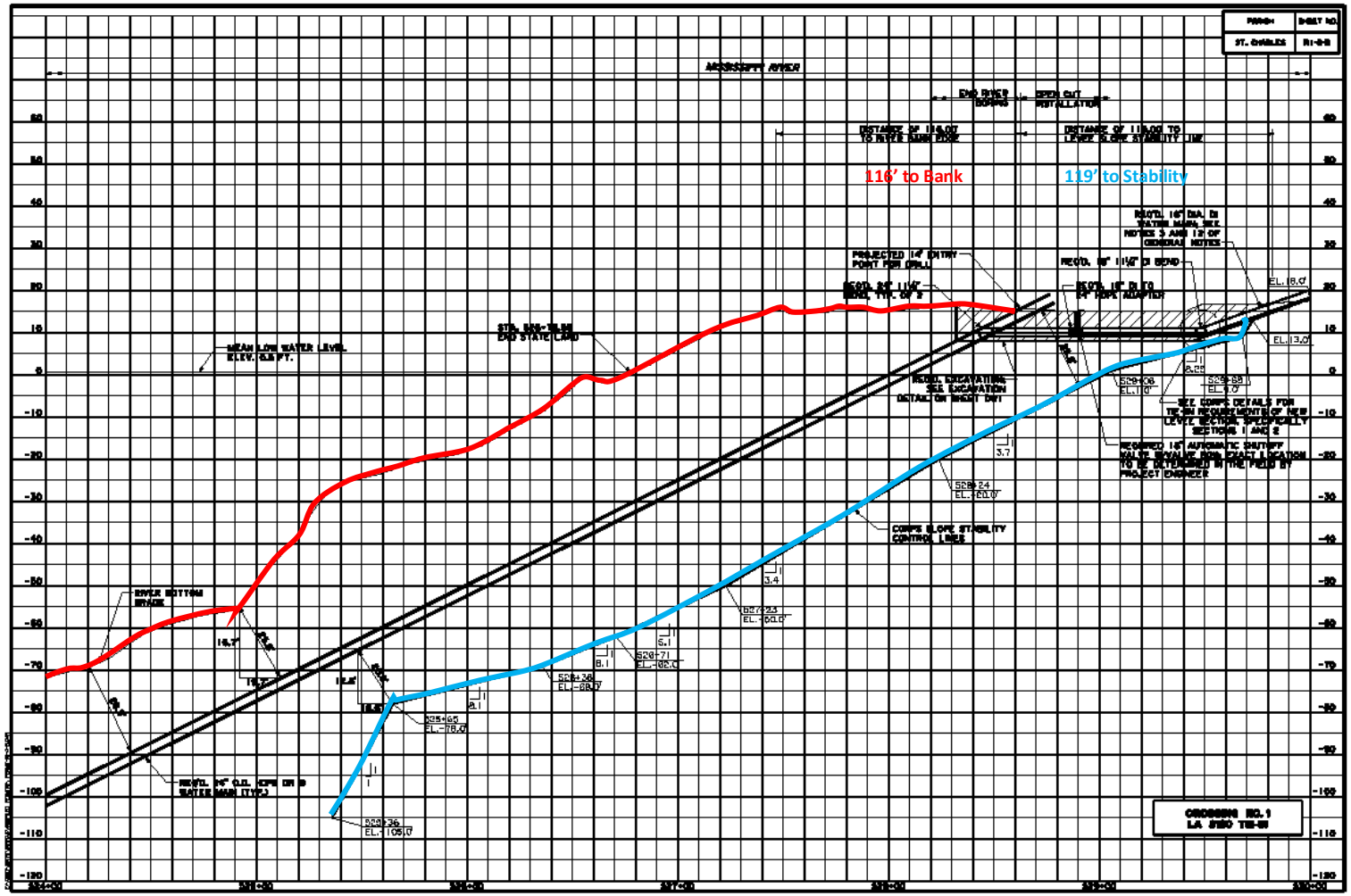

Permitting, etc.

- Louisiana Department of Transportation
  - Crossing LA 18 / LA 48 on both crossings
  - LA 3160
- Railroad Right of Way Permits
  - Illinois Central (Crossing #2a)
  - Union Pacific (Crossing #2b)
- Louisiana Department of Health and Hospitals
  - Office of Public Health
- Louisiana State Land Office (>$10,000)
- U. S. Coast Guard

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Permitting, etc.

- U.S. Army Corps of Engineers
  - Permits
  - Technical
  - Geotechnical Engineering
  - Structural Engineering
  - Mitigation
- Department of Natural Resources
  - Wetland Mitigation $7K for #1 - $36K for #2
- Pontchartrain Levee District
- Lafourche Levee District
- River Stage > 11 ft NGVD at Carrolton Gage
- Air Release / SCADA Controlled Valves / Flow Meters

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Construction of Crossing #1

- Construction
  - Vermeer 330x500 directional drilling rig was used
  - 8” pilot hole took 4 1/2 days averaging 733 ft/day (11”)
  - Backreaming pass made with 24-inch fly cutter
  - Second pass made with 36-inch fly cutter (16 Days)
  - Pullback of the Pipe took 10 hours (Max depth 150 feet)
  - Contained a compound curve of 6 degrees to the left and 9 degrees to the right to stay within acquired property
- Layout / Impact to State Highway (66 Joints of Pipe)
- Pressure Testing of High Density Polyethylene
  - Utilizing Air versus Water
  - Above / Below Ground

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Vermeer
GMC


VOLVO
VOLVO

Passing Bacteriological Testing

- Debris in Line
  - Pigging Line to remove debris (Used 93)
  - Fused Joints (66 Total on Crossing #1)
  - Elevation / Slope of Pipe
- "Timing" samples to ensure complete Disinfection of water main
  - AWWA recommends sample taps ever 1000'
- Videoing Interior of the Main

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MH inlet near
TO
MH middle of
10/01/2008
14:08
Joint 3
Camera Underwater
250.1 FT


MH inlet near
10/01/2008
TO
MH middle of
14:10
General Photo
250.1 FT

Rejecting / Redesign of Crossing #2

- Mississippi River Levee Slope Stability Line
- Acquiring land / Servitude
  - Land Purchase
    - Multiple Owners (11) with pipe at 45 degrees to property
- New Permits (Starting the Process Again)
  - USACOE
  - Pontchartrain and Lafourche Levee Boards
  - LDOTD
  - DNR
  - Louisiana State Land Office
  - LDHH

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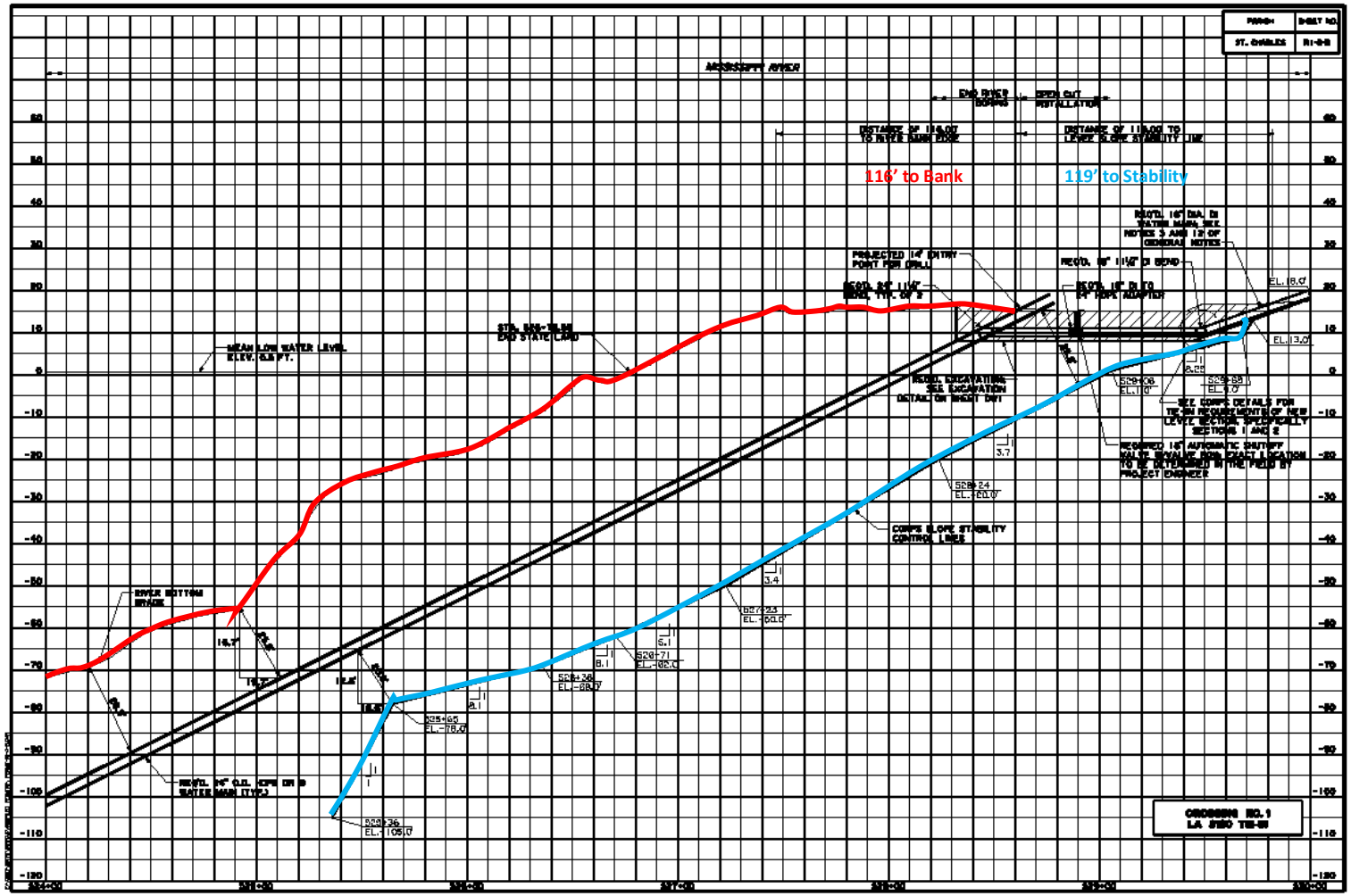

SHREAD-KUYRKENDALL & ASSOC. ENGINEERS-SURVEYORS-PLANNERS BATON ROUGE, LOUISIANA	MISSISSIPPI RIVER SUB-AQUEOUS CROSSING NO. 2	VICINITY MAP ST. CHARLES PARISH, LOUISIANA

Constructing Crossing # 2

- Construction
  - 8” pilot hole took 3 days averaging 1000 ft/day (4”)
- Backreaming pass made with 24-inch fly cutter
- Second pass made with 36-inch fly cutter (14 Days)
- Pullback of the Pipe took 8 hours (Max depth 165 feet)
- Avoiding Construction Delays / Damages
- Fusible Pulling Head
- Filling the Line with Water Prior to Pull
- Gashes in Pipe Wall / What is acceptable? 10%
- Road Closures and their impact on community
- Impacts to the Environment (Historic Oak Trees)
- Impacts to local residents / businesses (RR Luling)

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VOLVO


VOLVO


VOLVO

Benefits of Connections
Anticipated

- Reduce / Eliminate Dependence on outsiders
- Redundancy of Water Intakes
- Increasing Water Pressure / Flows
- Ability to use excess Capacity on West to Supplement East in the events that demand exceeded design capacity or with failure of East Bank C Plant
- Freeze Event (1.5 MGD to East)

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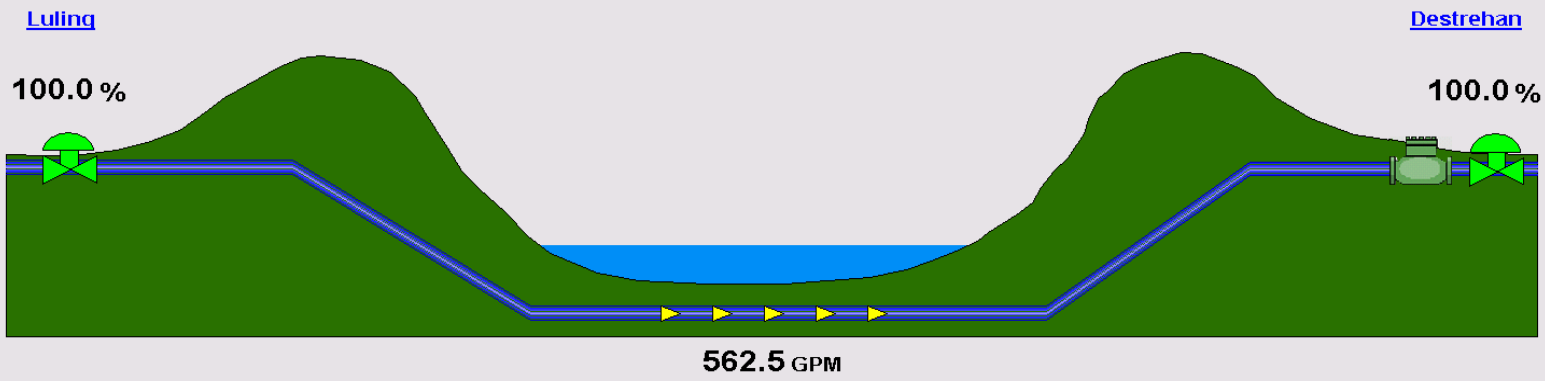
Westbank Plant | Flow Trends

South Tranfer Line

2:08:11 PM
4/13/2010

ST
SR
MZ
BG
DA
T
NT

Daily Positive Flow	516722 GALLONS
Daily Negative Flow	-141 GALLONS
Weekly Positive Flow	2874256 GALLONS
Weekly Negative Flow	-141 GALLONS



Ack	Time In	Tagname	Status	Value	Description
✓	14:30:04.328	B3_4FILTER_LEVEL	LO	10.7	Filter B-3/4 Level
✓	13:47:51.820	DA_SYSTEM_DISARMED	CFN	DISARM	Des Allemands Security Alarm System On
✓	08:29:43.300	DISTNW	LOLO	1	Distribution Water Flow North West
✓	08:09:45.968	FRONT_GATE_CONTACT	CFN	GATE OPEN	
✓	07:23:51.810	TANK3	LOLO	-0.3	Storage Tank Level
✓	06:54:28.300	RAWA	LO	93	Raw Water Flow A Plant

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Benefits

More than Anticipated

- Ability to Balance Flows from Each Unit to Increase Efficiency
- WB D-Plant out of service at Peak Demand Season
- EB Distribution Mains at Plant rerouted with no issues to customers
- Changes throughout both Distribution Systems
- River Crossings vs. Storage Tanks
  - (1 Million Gallons = 4.8 Hours)

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Questions or Comments?

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