

The Prefect Storm – Zebra Mussels and Drought Lead City to Restore Reservoir

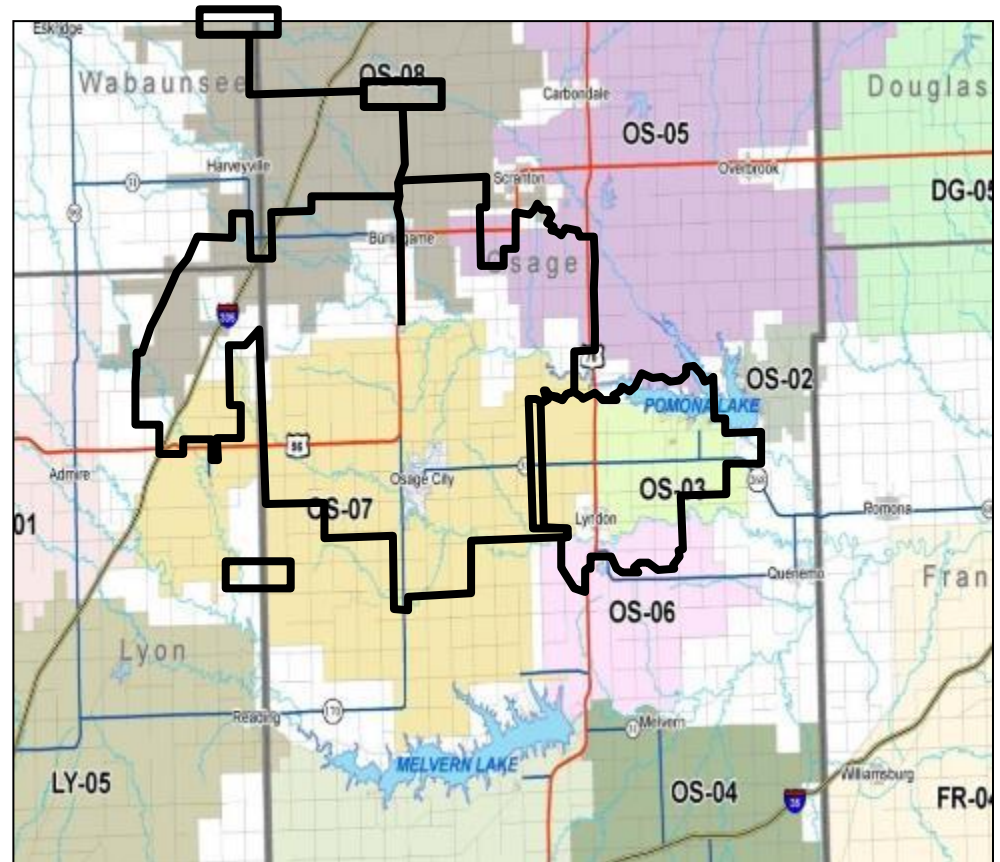
Oklahoma Clean Lakes and
Watersheds Conference
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Rick Besancon

Osage City Reservoir Restoration Project

Osage City Service Area

- ▶ Wholesale Customers
 - Reading, KS
 - Harveyville, KS
 - Burlingame, KS
 - RWD No. 6
 - RWD No. 7
 - Osage City, KS



Osage City Reservoir Restoration Project

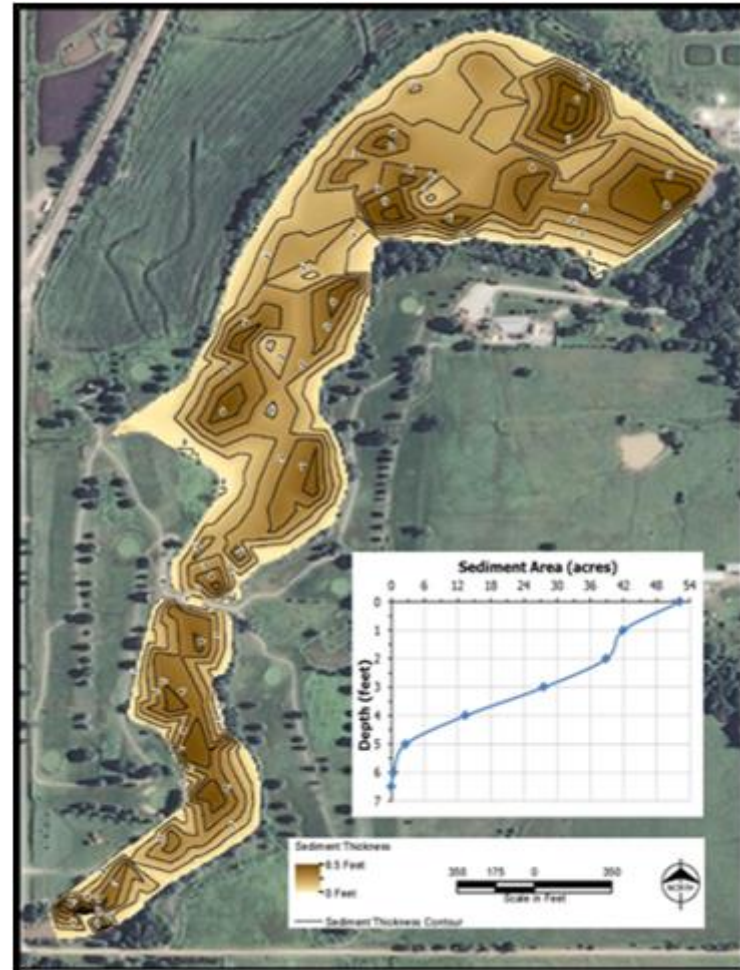
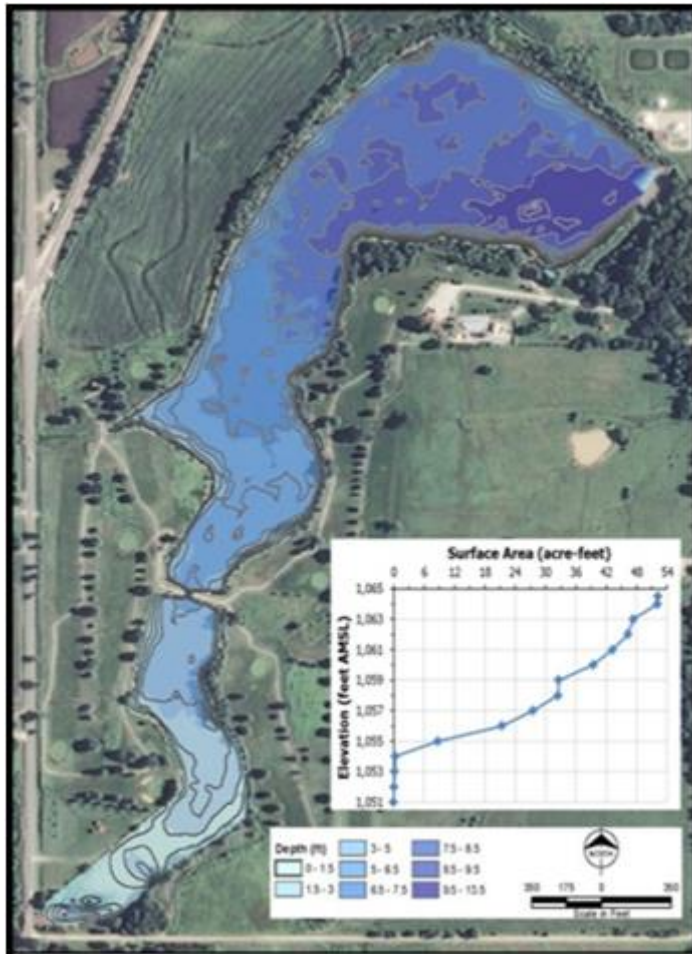
Site Investigation

- ▶ Osage City Reservoir
 - ▶ 52 acres
 - ▶ 350 acre feet
- Design Capacity
 - ▶ 499 acre feet or 805,000yds³
- Sediment Volume
 - ▶ 149 acre feet or 240,400 yds³
- Sediment Concentrations
 - ▶ Phosphorous - 300 to 500 mg/kg
 - ▶ Nitrogen – 50 to 90 mg/kg



Osage City Reservoir Restoration Project

Data Collection



Osage City Reservoir Restoration Project

Restoration Goals

- ▶ Reservoir
 - Increase Water Storage Capacity
 - ▶ Removal of 100,000 cubic yards
 - ▶ Construct Two Forebays
 - Trap Sediment
 - Enhance Vegetative Growth (wetlands)
 - ▶ Removal of Nutrients
 - ▶ Enhance Water Based Activities



Perfect Storm

MISSION CRITICAL (April 2012)

- Melvern Lake Supply Line
 - ▶ Plugged by Zebra mussels
 - ▶ Off-line for over 75 days
 - ▶ Rehabilitated supply line



Perfect Storm

Drought Intensified Drawdown

- Pumped up to 931,000 gallons per day
- 45 Million Gallons Total
- Typically 7 Million Gallons Per Year
- Intense User Demand
- Osage City Reservoir Dropped 10 Feet

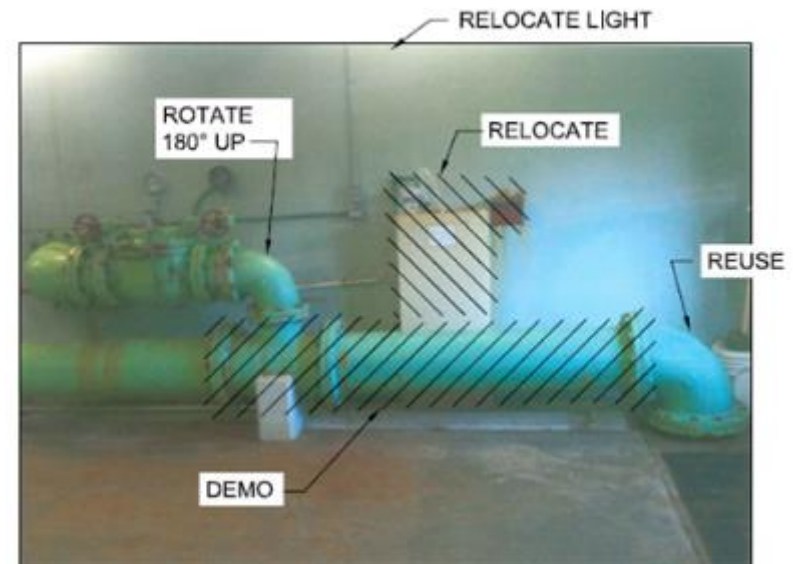


Zebra Mussel Control

Piping Retro Fit

- Potassium Permanganate Feed System
- Strainer Installation

New Screens – Copper-Nickel Alloy



An aerial photograph of a large, irregularly shaped pond. The pond is outlined with a solid blue line. A dashed blue line extends from the bottom of the pond, following a path through the surrounding landscape. The landscape is a mix of brown, tan, and green areas, suggesting a mix of bare earth, grass, and some vegetation. There are some small structures and what looks like a road or path near the top left of the pond.

Restoration Project

- Increase capacity to 450 acre feet
 - ▶ Remove 100,000 Cubic Yards
 - ▶ Hydraulic Dredging
 - ▶ Construct Two Forebays

Dispose of Material Offsite

Original Bid – Hydraulic Dredging

Conditions Change



Construction

- ▶ Mechanical Excavation
- ▶ 100,000 CY
- ▶ Started Mid July 2013







Osage City Reservoir Restoration Project

Restoration Goals

- ▶ Reclamation of Disposal Site (former rock quarry) 6.5 miles from site
 - Memorandum of Understanding
 - ▶ Osage City and KDWPT
 - Site Preparation
 - ▶ Install Rock check dams
 - ▶ Placement of sediment
 - ▶ Seed native grasses
- Placement of 100,000 yd³
- Grading
- Seeding and Mulching



Osage City Reservoir Restoration Project



Osage City Reservoir Restoration Project



Questions



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