

# Engineering Working Group Report to Arkansas River Infrastructure Task Force

Schematic Design / Cost Estimates  
April 30, 2015

# Agenda

- Introduction
- Arkansas River System Improvements
- Public Access/Recreational Improvements
  - Sand Springs
  - Zink Dam
  - South Tulsa/Jenks
  - Bixby
- Preliminary Implementation Schedule
- Cost Estimates

## Arkansas River Low Water Dams and Public Access/Recreational Improvements

### *Schematic Design and Cost Estimates*



# Engineering Working Group Participants

- Stuart Solomon/PSO - Chairman
- Jared Cottle/Bixby
- Tom Rains/Tulsa County
- Derek Campbell/Sand Springs
- Paul Zachary/Tulsa
- Robert Carr/Jenks
- Gaylon Pinc/PMg
- Rich Brierre/INCOG
- Bob Jack/Manhattan Construction
- Bill Smith/River Parks Authority
- Kirby Crowe/PMg
- Lars Ostervold/CH2M HILL
- Murry Fleming/CH2M HILL

# Consultant Team



# Project Components & Related Improvements

## Facilities & Improvements

- New Low Water Dams (3)
- New Pedestrian Bridges (2)
- Zink Dam Modification
- Off-channel Boat Launch Areas (2)
- Shoreline Park Areas (6)
- Recreational Water Features (2)

## Related Issues & Costing Elements

- River Hydraulics / Hydrology
- Gate Design – Full-height & Crest
- Hazard Mitigation
- Environmental Permitting
- Habitat Mitigation
- Bank Stabilization
- Outfall Infrastructure
- Property Acquisition
- Utilities (water, sewer & power)

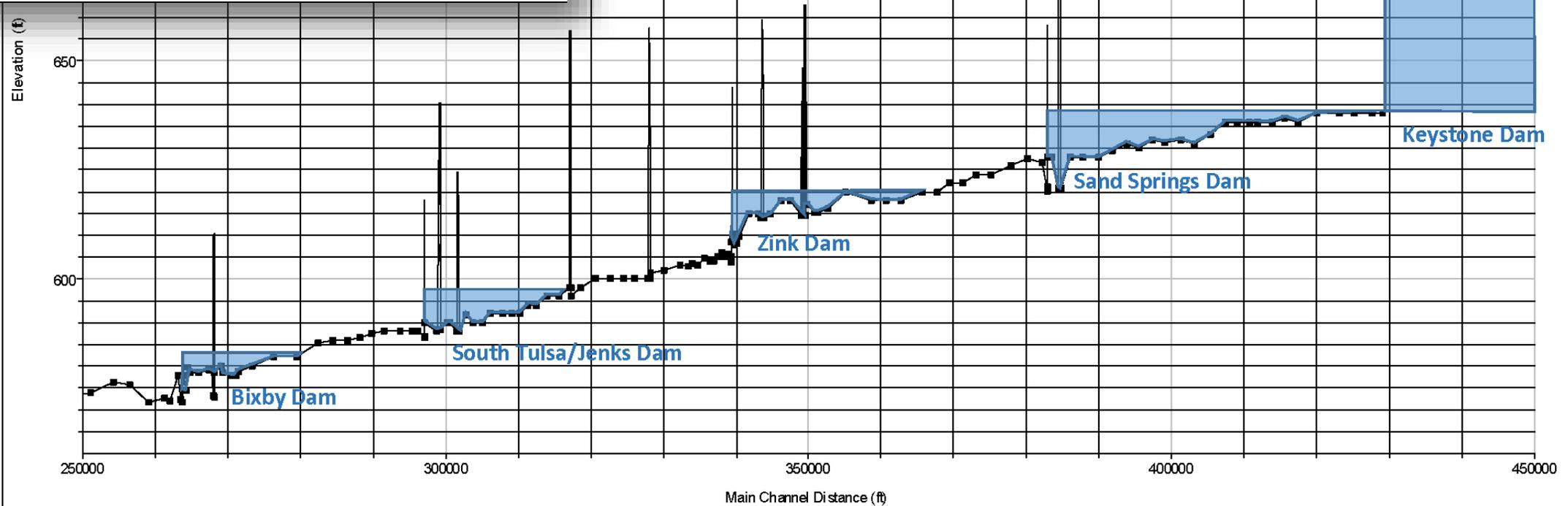


Arkansas River Tulsa County

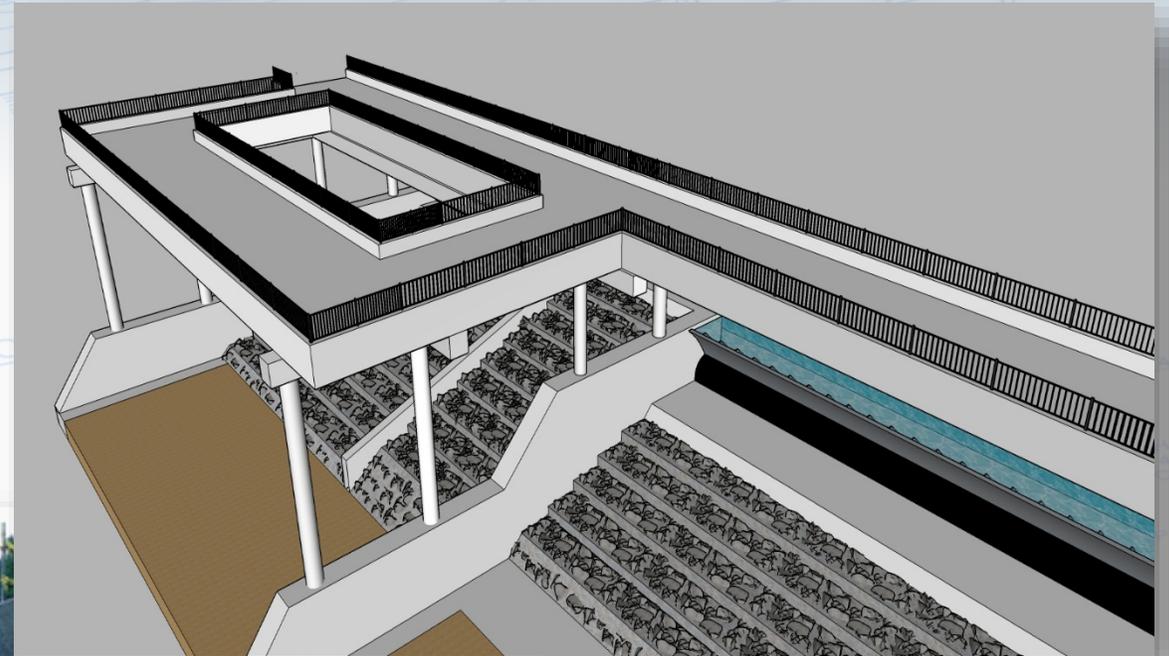
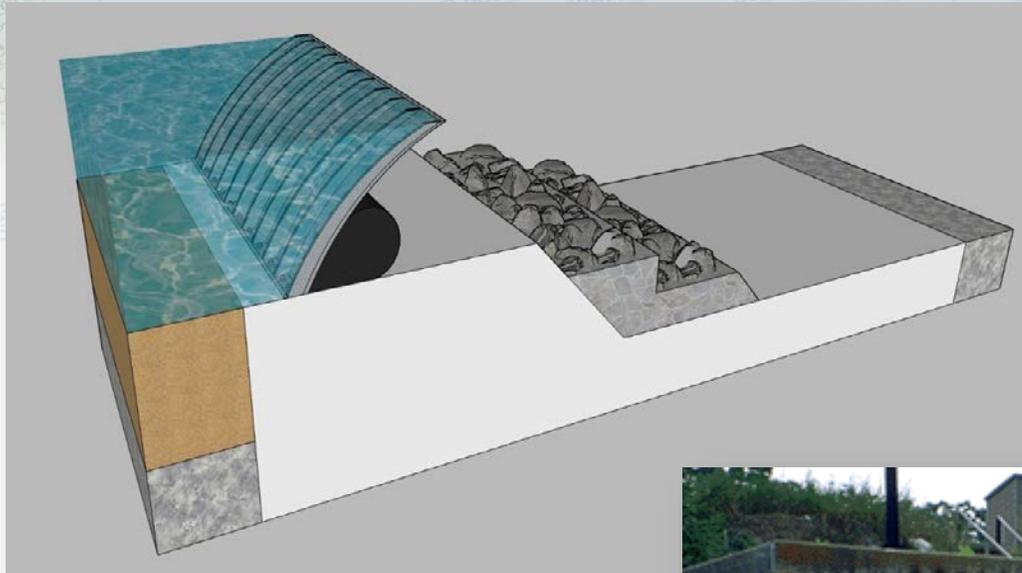
**Estimated Minimum Flows and Release Durations**

Release Rate (cubic feet per second)	Duration of Release (days)
550	3.0
660	2.5
825	2.0
1,000	1.65

Legend  
 ■ Ground

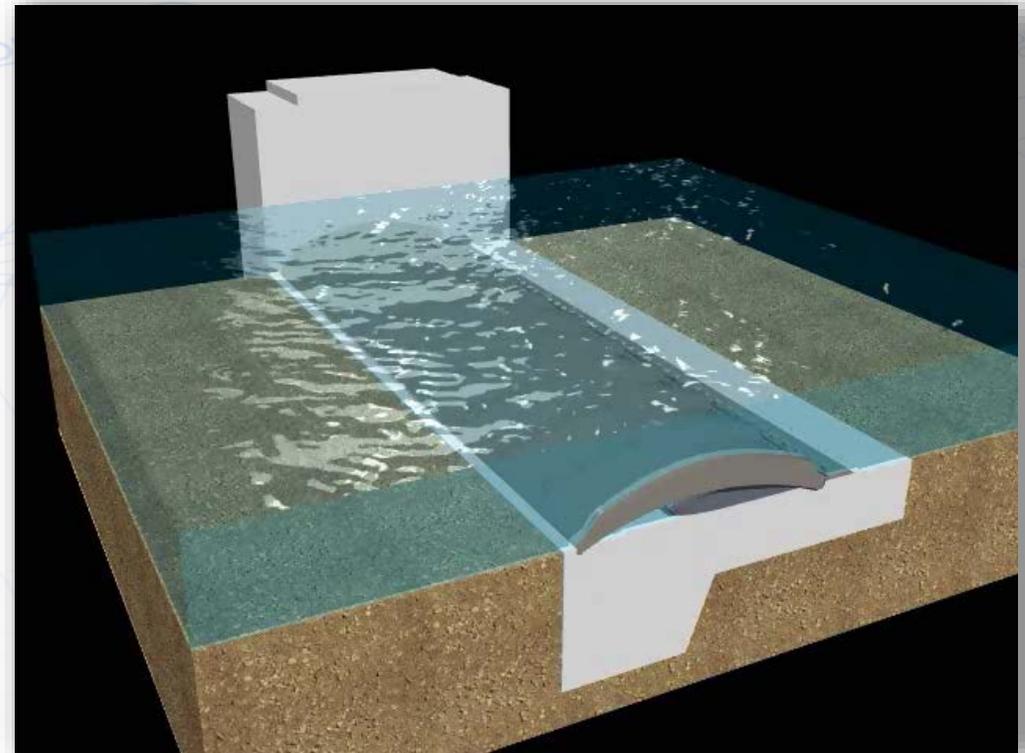


# Lake Level Control and Hazard Mitigation



# Environmental Considerations

- Creation of Habitat to offset Construction Impact
- Provisions for Fish Passage and Egg Transport



# Other Considerations Common to All Projects

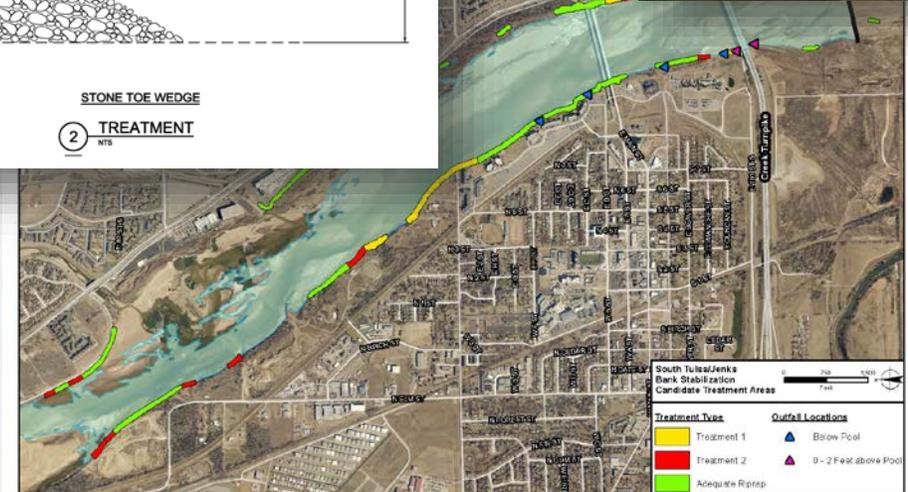
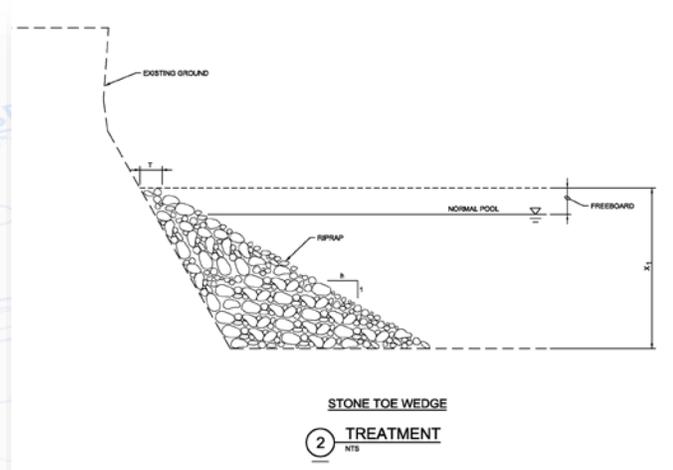
- Bank Stabilization
- Protection and Reinforcement of Select Existing Outfalls

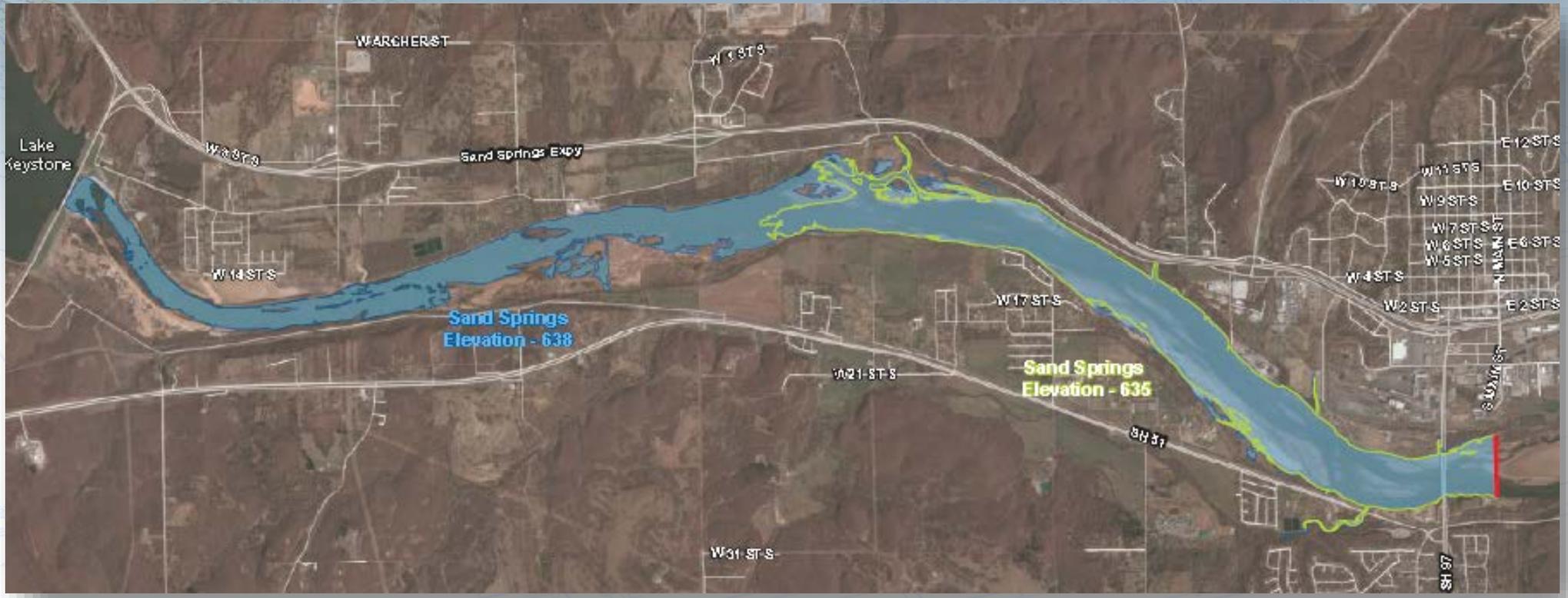


Zink #3002, 60", 1.67' below, Photo 2



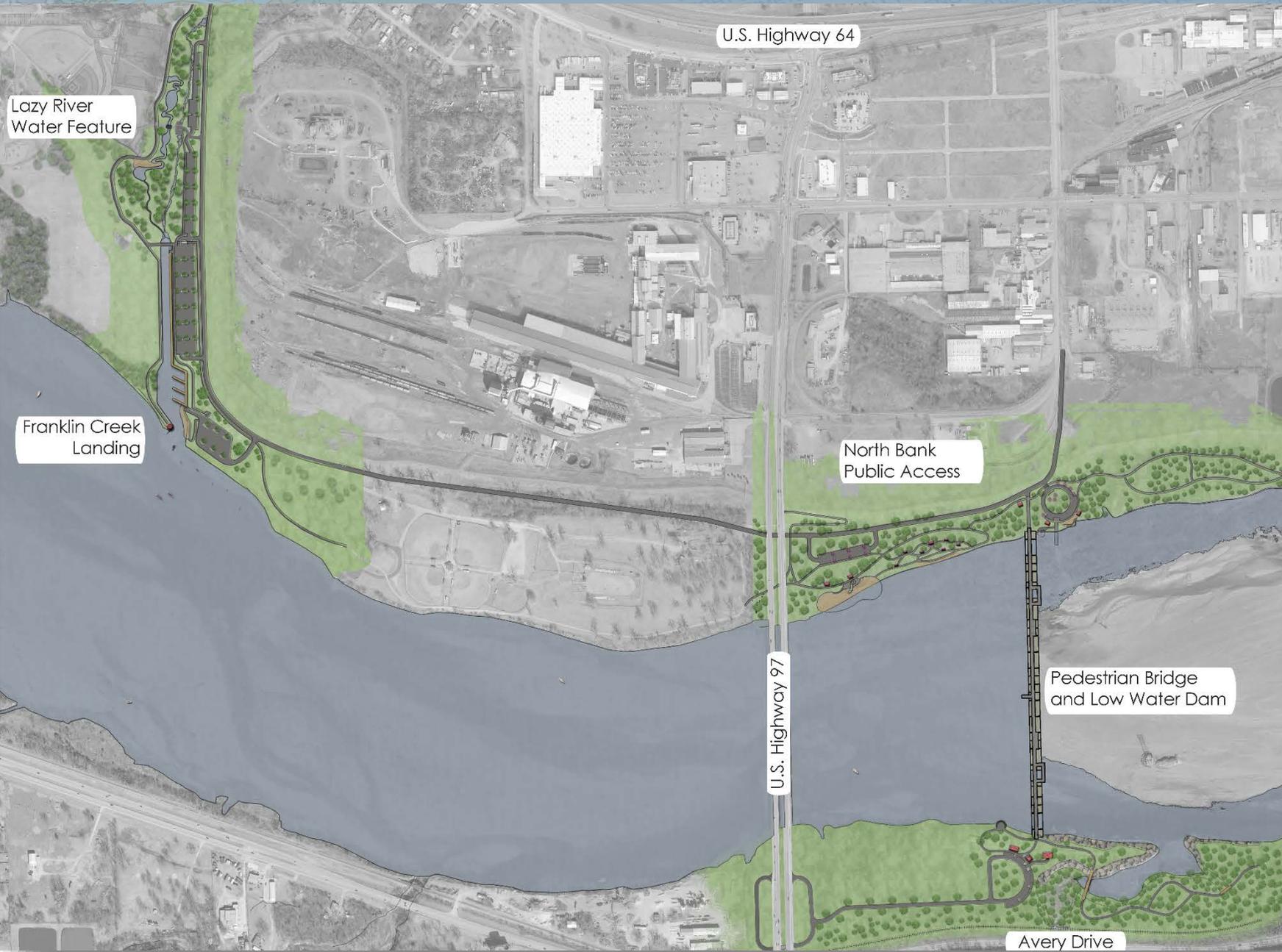
Zink #3003, 24", 1.29' above, Photo 1





# Sand Springs



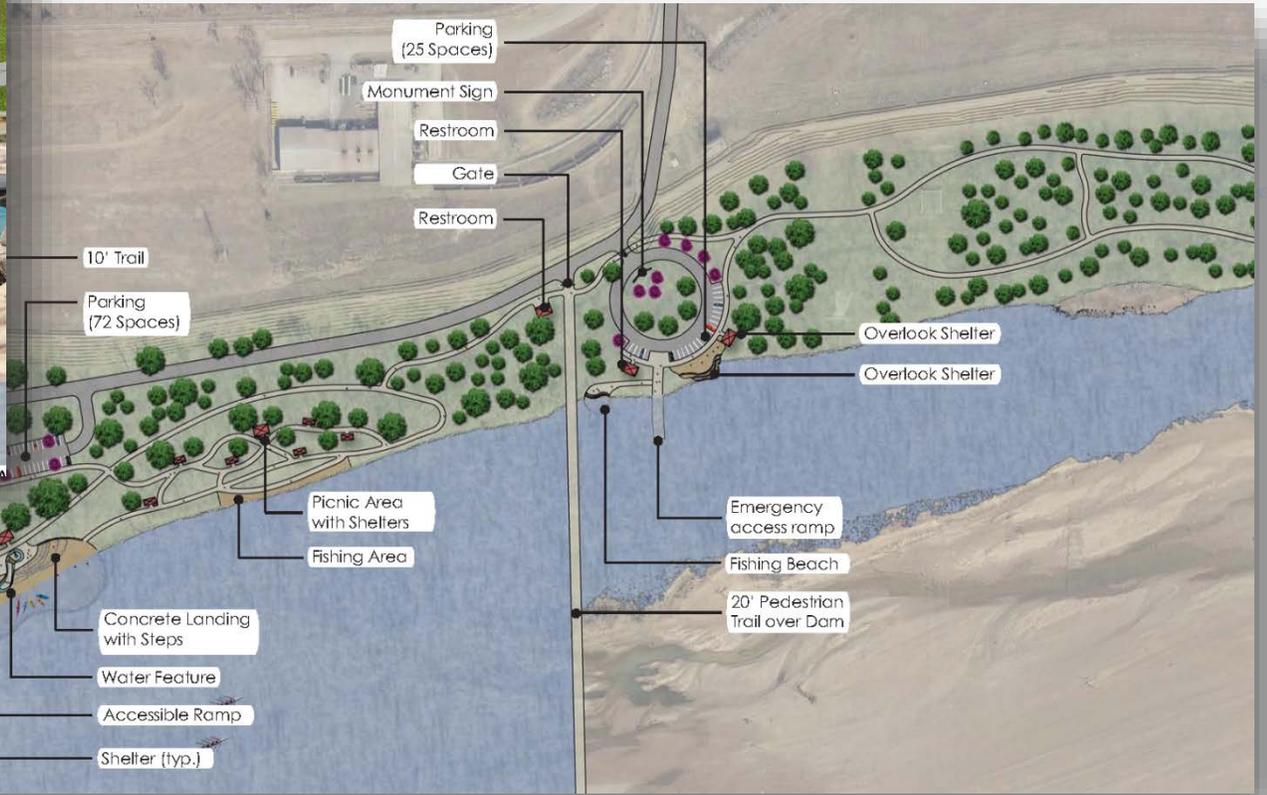




# Sand Springs – North Bank



SAND SPRINGS NORTH BANK PUBLIC AREA





# Zink Dam





# Zink Dam



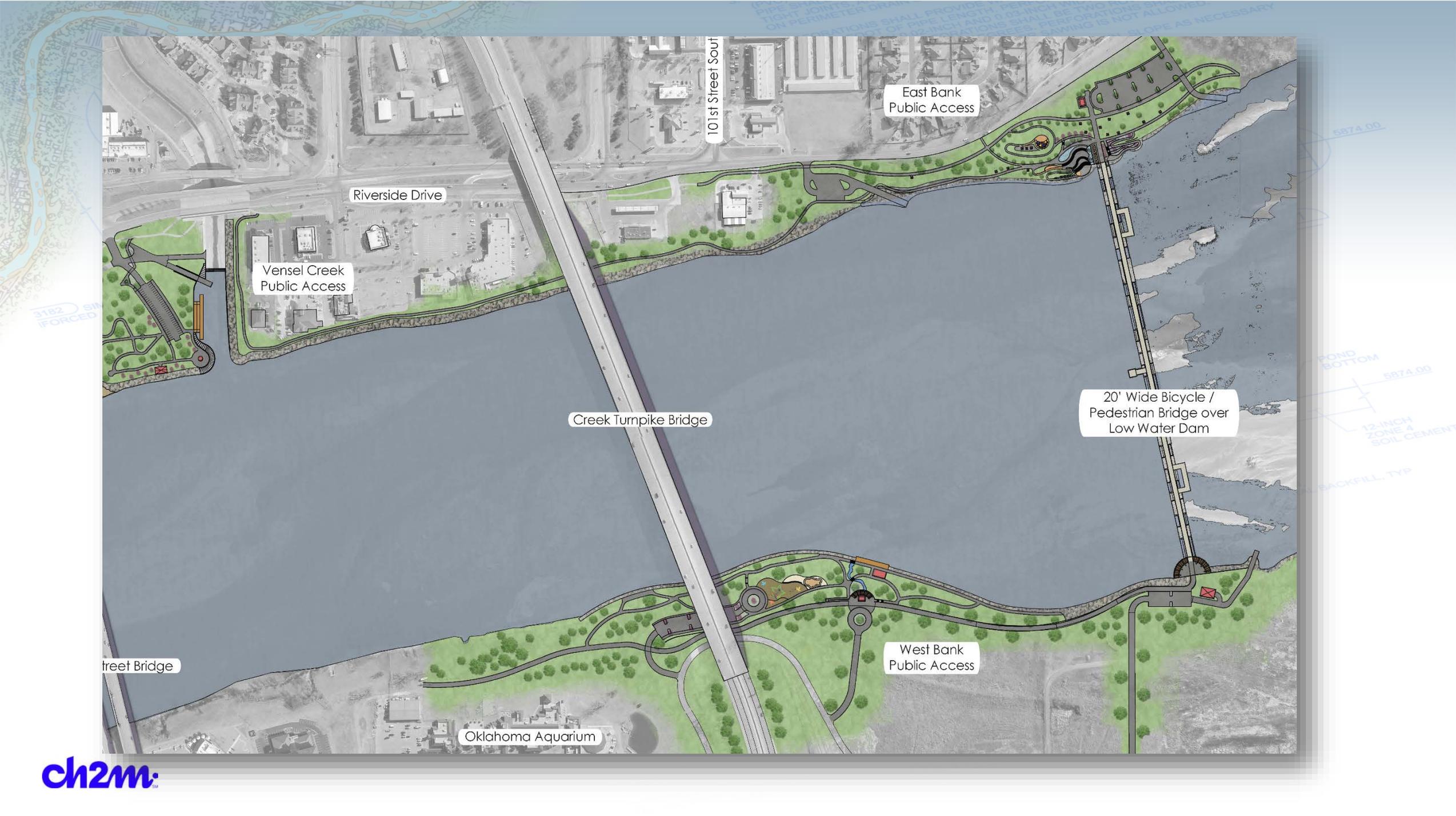
ZINK RECREATION



# Zink Dam – Lake Area







East Bank  
Public Access

Riverside Drive

Vensel Creek  
Public Access

101st Street South

Creek Turnpike Bridge

20' Wide Bicycle /  
Pedestrian Bridge over  
Low Water Dam

West Bank  
Public Access

Oklahoma Aquarium

Street Bridge

5874.00

POND  
BOTTOM

5874.00

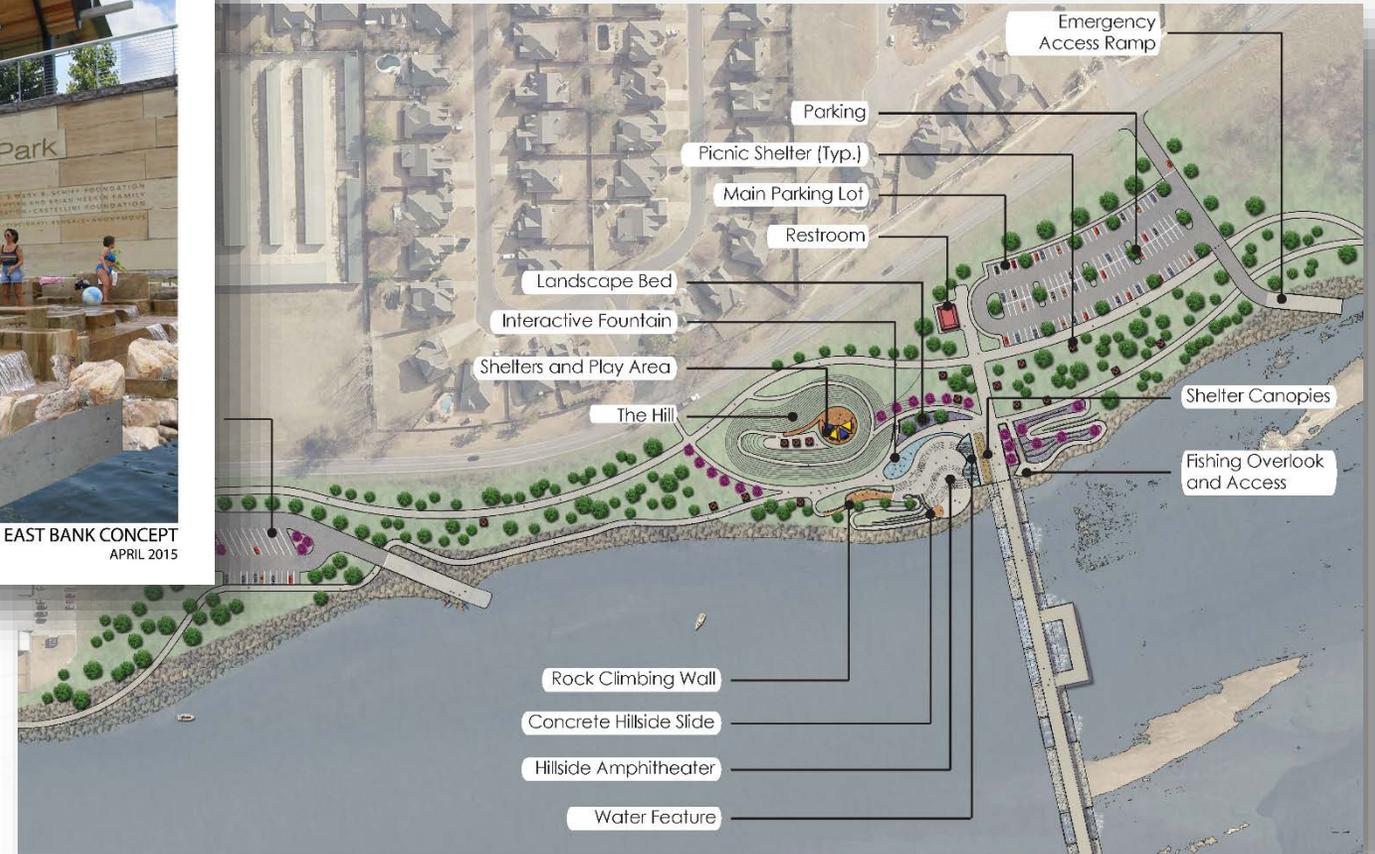
12-INCH  
ZONE 4  
SOIL CEMENT

BACKFILL TYP

# South Tulsa/Jenks – East Bank



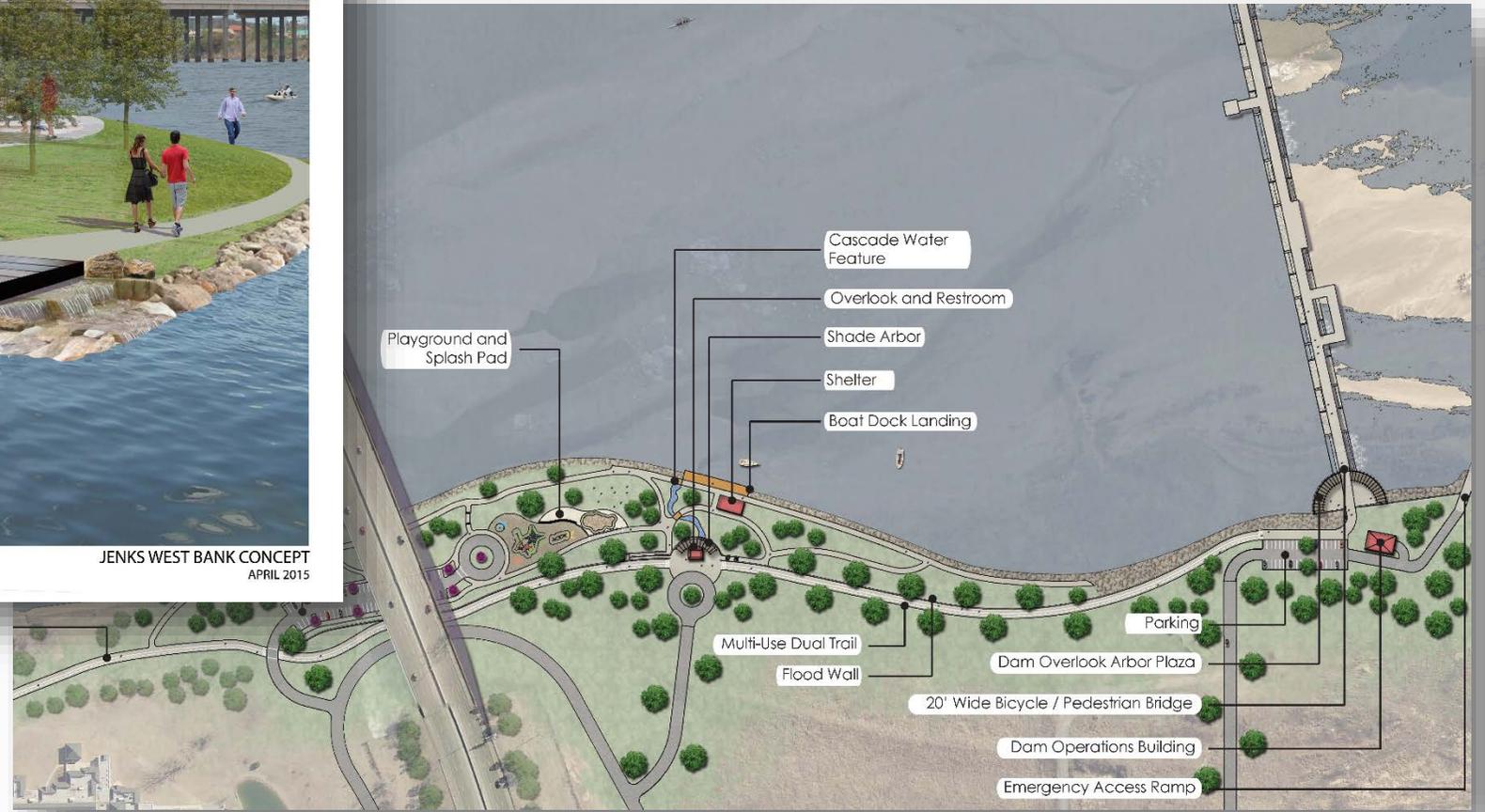
SOUTH TULSA/JENKS EAST BANK CONCEPT  
APRIL 2015



# South Tulsa/Jenks – West Bank



JENKS WEST BANK CONCEPT  
APRIL 2015





# Bixby

ch2m:

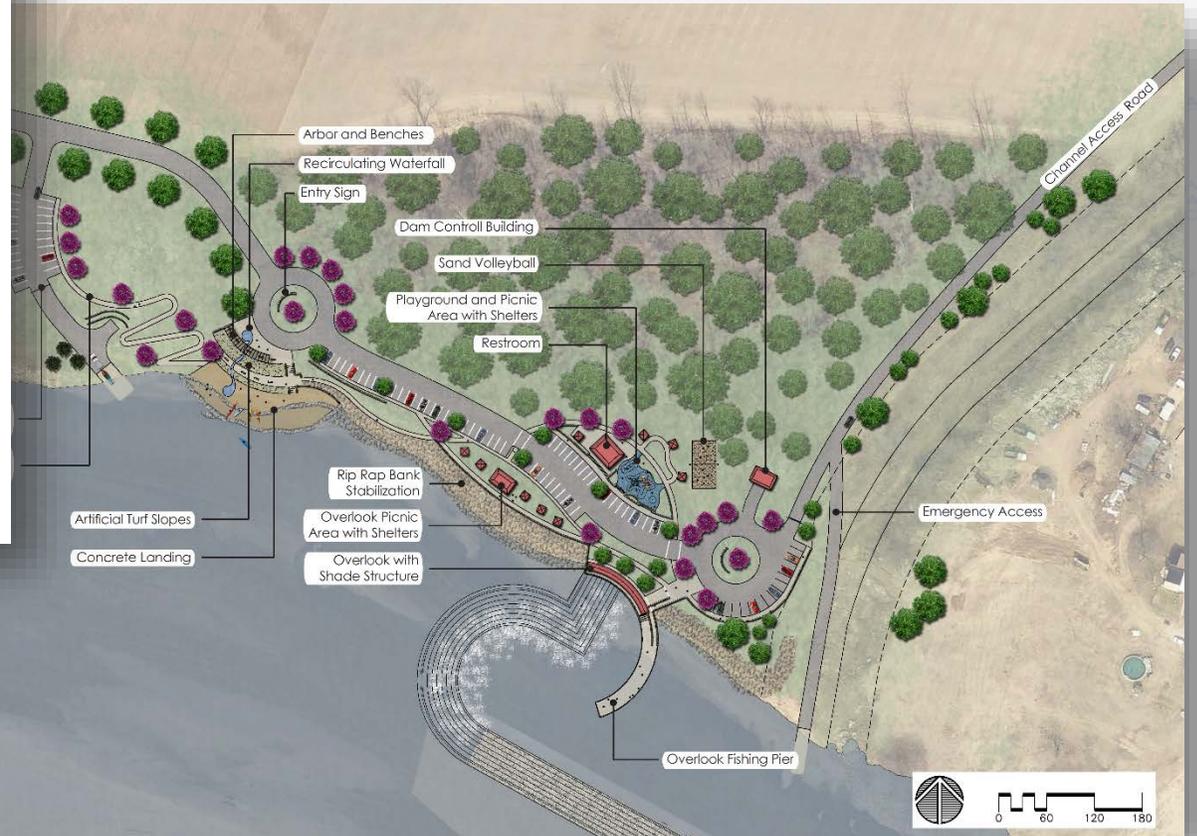
**Bixby**  
The Natural Choice  
for Business



# Bixby – North Bank



BIXBY NORTH BANK CONCEPT  
APRIL 2015



# Bixby – North Bank



BIXBY NORTH BANK CONCEPT  
APRIL 2015





# Preliminary Implementation Schedule



# Cost Estimates

# Estimated Capital Cost

TABLE ES-1  
Total Project Costs

Project Summary of Total Project Costs (x1,000)

Location	Dam/Bridge	Public Access/ Recreation	Bank Stabilization/ Outfalls	Compensatory Mitigation / Preservation	Permitting	Total
Sand Springs	65,230	32,487	3,876	5,225	1,051	107,869
Zink	38,442	18,799	927	1,718	354	60,240
South Tulsa/Jenks	47,240	29,597	1,797	844	422	79,900
Bixby	45,735	18,648	1,767	813	1,038	68,001
					Total	\$316,010

# Operation, Maintenance & Capital Replacement

**TABLE ES-2**  
**Operation and Maintenance Costs**

	Dam/ Gates	Public Access/ Recreational	Total
Yearly Operation and Maintenance Costs			
Yearly O&M	\$520,000	\$1,018,000	\$1,538,000

**TABLE ES-3**  
**Periodic Capital Replacement and Maintenance Costs**

Yearly Sinking Fund Contribution	
Gate Rubber Bladders /30 years	\$293,000
Sediment Removal / 5 years	\$284,000
Gate Epoxy Coating / 20 years	\$9,000
Compressor Air System/20 years	\$26,000
Least Tern Island Replenishment/7 years	\$13,000
Buoy Replacement	\$14,000
Initial 5-year Mitigation Monitoring	\$160,000
Yearly Sinking Fund	\$799,000

# Arkansas River Low Water Dams and Public Access/Recreational Improvements

## Schematic Design and Cost Estimates



<http://www.riverprojectstulsa.info>