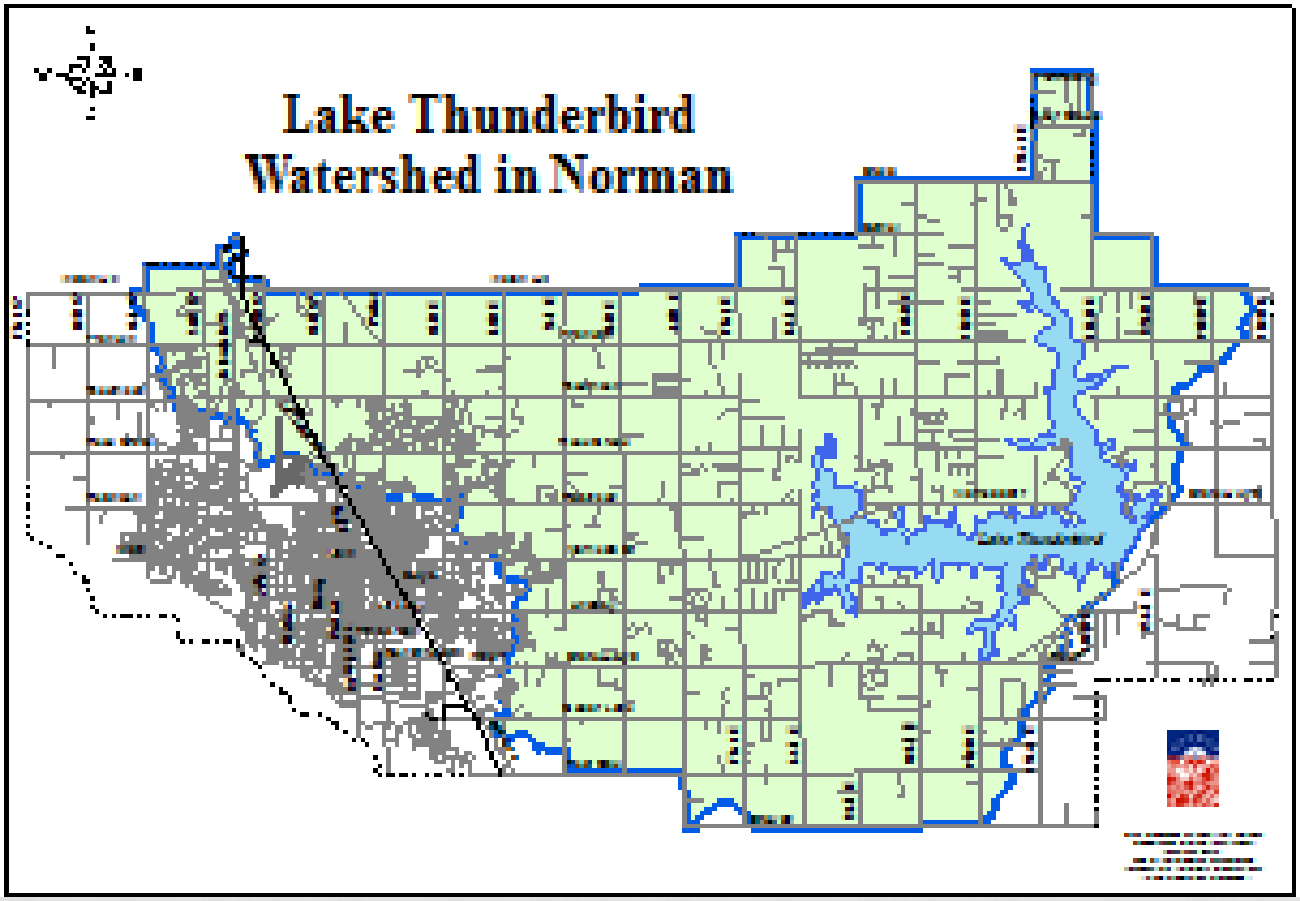
CITY OF NORMAN
LAKE THUNDERBIRD TMDL

CARRIE J. EVENSON, PH.D., P.E., CFM
STORMWATER PROGRAM MANAGER

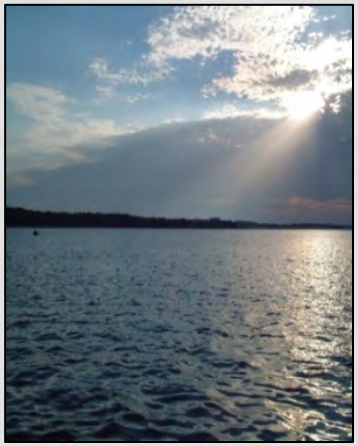


Norman is **190 square miles** in total

132 square miles is in the Lake Thunderbird watershed

TMDL TIMELINE

- 2007 – Storm Water Master Plan identifies water quality priority
- 2010 – EPA Placed Lake Thunderbird on its 303(d) List of Impaired Waterbodies
- Nov. 2013 – ODEQ Published Lake Thunderbird TMDL
- Oct. 2014 – June 2015 – Norman TMDL Compliance and Monitoring Plan Development

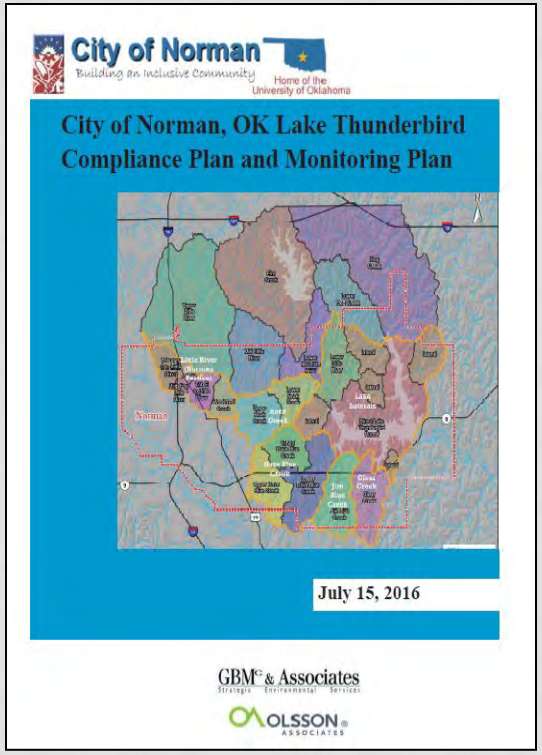


TMDL TIMELINE

- Oct. 27, 2015 – Council Endorsement of Draft Plans
- Nov. 5, 2015 – Draft Plans Submitted to ODEQ
- Jan. 8, 2016 – ODEQ Comments Received
- July 22, 2016 – Revised Plans Submitted to ODEQ
- Sep. 21, 2016 – ODEQ Approval of Plans
- Oct. 25, 2016 – Council Adoption of Approved Plans

WHAT IS A TMDL COMPLIANCE AND MONITORING PLAN?

- Describes how load reduction requirements listed in Appendix E of the TMDL will be met
- Includes schedules for monitoring and implementation of structural and non-structural BMPs

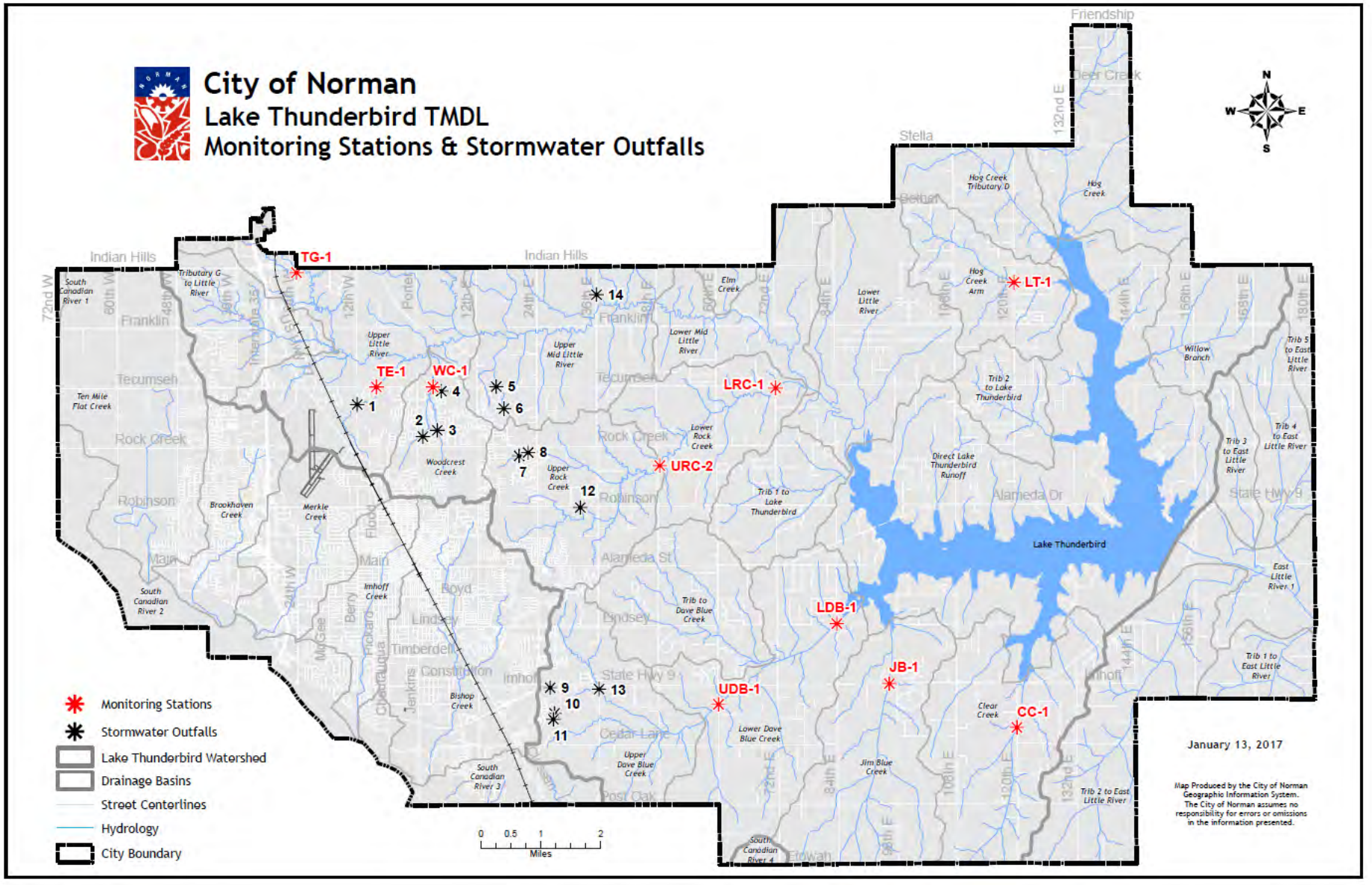


MONITORING PLAN

- Implementation required by November 12, 2016
- City Council authorized Contract for Monitoring Services with OWRB on January 26, 2016
- Monitoring data to be made available on City website in FYE 2018
  - Awaiting sufficient data to calculate loading rates and observe trends
- Coordination with Cities of Oklahoma City and Moore currently occurring at the staff level

MONITORING PLAN

- Monitoring Activities:
  1. Install Water Level Gauges at 10 TMDL Monitoring Stations
     - Installed in May 2016
  2. Conduct Sampling at 10 TMDL Monitoring Stations and 7 of 14 Major Discharge Outfalls
     - Began in March 2016
     - Analyzed for Total P, Total N, TSS
     - Field measurement of pH, DO, temperature, specific conductance and turbidity
  3. Maintain Quality Assurance Project Plan Requirements
     - Included with Monitoring Plan
  4. Partner with OCC for Cost-Free Biological Monitoring (Every Other Year)

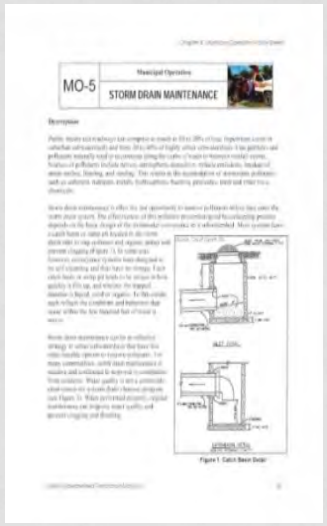

City of Norman
Lake Thunderbird TMDL
Monitoring Stations & Stormwater Outfalls
TG-1
TE-1
WC-1
LRC-1
URC-2
LT-1
LDB-1
JB-1
UDB-1
CC-1
1
2
3
4
5
6
7
8
9
10
11
12
13
14
Lake Thunderbird
Indian Hills
Franklin
Tecumseh
Rock Creek
Robinson
Main
Boyd
Lindsey
Timberdell
Construction
Imhoff
State Hwy 9
Alameda St
Alameda Dr
Cedar Lane
Post Oak
Friendship
Deer Creek
Stella
Bethel
Hog Creek Tributary D
Hog Creek
Hog Creek Arm
Lower Little River
Willow Branch
Trib 5 to East Little River
Trib 4 to East Little River
Trib 3 to East Little River
East Little River 1
Trib 1 to East Little River
Trib 2 to East Little River
Trib 2 to Lake Thunderbird
Direct Lake Thunderbird Runoff
Trib 1 to Lake Thunderbird
Elm Creek
Lower Mid Little River
Upper Mid Little River
Upper Little River
Lower Rock Creek
Upper Rock Creek
Woodcrest Creek
Trib to Dave Blue Creek
Lower Dave Blue Creek
Upper Dave Blue Creek
Jim Blue Creek
Clear Creek
Ten Mile Flat Creek
Brookhaven Creek
Merkle Creek
Imhoff Creek
Bishop Creek
Tributary G to Little River
South Canadian River 1
South Canadian River 2
South Canadian River 3
South Canadian River 4
Monitoring Stations
Stormwater Outfalls
Lake Thunderbird Watershed
Drainage Basins
Street Centerlines
Hydrology
City Boundary
0 0.5 1 2
Miles
January 13, 2017
Map Produced by the City of Norman Geographic Information System. The City of Norman assumes no responsibility for errors or omissions in the information presented.

MONITORING SCHEDULE

Activity	2016	2017	2018	2019	2020	2021
Installation of Gauging Stations	Completed May 2016					
Sampling at Monitoring Stations	10 sites/month	10 sites/month	10 sites/month	10 sites/month	10 sites/month	10 sites/month
Sampling at Major Discharge/Significant Stormwater Outfalls	7 sites/year	7 sites/year	7 sites/year	7 sites/year	7 sites/year	7 sites/year
Review of Monitoring Data	Reported Annually	Reported Annually	Reported Annually	Reported Annually	Reported Annually	Reviewed to assess need for additional BMPS or retrofits

COMPLIANCE PLAN (FYE 2017)

- Implement Non-Structural BMPs
  - Increase Street Sweeping and Storm Sewer Maintenance
    - 4th Street Sweeper and Crew added in FYE 2017
  - Educational Based Programs
    - Fertilizer Use
      - Soil testing before applying phosphorus
      - Applicator registration and education
      - Community outreach
    - Pet Waste Management
      - Pet waste receptacles in City parks
        - 30 receptacles located in 25 of the 62 parks
      - Community outreach through media
    - Septic System Maintenance
      - Identify properties with private sewage systems for educational outreach
    - Watershed Protection
      - Educate property owners on stream protection



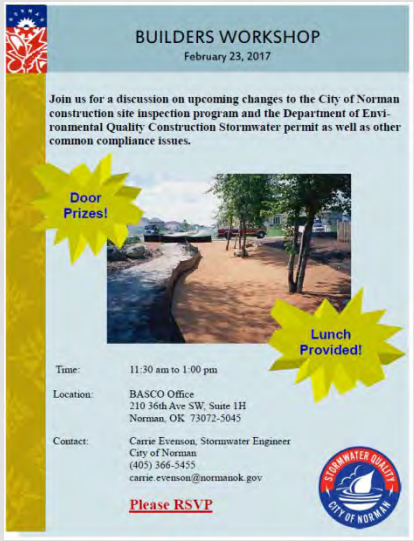
COMPLIANCE PLAN (FYE 2017)

- Improve Construction Stormwater Compliance with Existing Regulations
  - Continued Education and Training
    - Bi-annual training with builders and developer
    - Quarterly stormwater newsletter
    - On-site individual technical assistance
  - Review Stormwater Pollution Prevention Plans prior to and during construction
  - Increased inspection of sites during construction
  - Enhanced enforcement of regulations based on noted violations during construction
- 2nd Stormwater Compliance Inspector hired in June 2017

FUTURE PLANS (FYE 2018 – 2021)

- Continue Implementation of Non-Structural BMPs
  - Increase Street Sweeping and Inlet Cleaning Frequency
    - Street Sweeping Increase from Annually/Bi-Annually (Secondary Roads/Arterial Roads) to Bi-Annually/ Quarterly
    - Inlet Cleaning to increase from as needed to bi-annually
    - 5th and 6th Street Sweepers and Crew needed in FYE 2019 and 2020
- Rededicate Enforcement of Construction Stormwater Requirements
  - 3rd Stormwater Compliance Inspector needed by FYE 2020


MO-4
STREET SWEEPING


BUILDERS WORKSHOP
February 23, 2017

Join us for a discussion on upcoming changes to the City of Norman construction site inspection program and the Department of Environmental Quality Construction Stormwater permit as well as other common compliance issues.

Door Prizes!

Lunch Provided!

Time: 11:30 am to 1:00 pm

Location: BASCO Office
210 36th Ave SW, Suite 1H
Norman, OK 73072-5045

Contact: Carrie Evenson, Stormwater Engineer
City of Norman
(405) 366-5455
carrie.evenson@normanok.gov

Please RSVP

STORMWATER QUALITY CITY OF NORMAN

FUTURE PLANS (FYE 2018 – 2021)

- Review First Three Years of Monitoring Data
  - Set New Loading Baseline (Using all Available Data)
  - Adapt Compliance Plan as Necessary
- Implement Stream Stabilization BMPs
  - Partner with OCC and Local Agricultural Extension Agent to Accomplish this Task

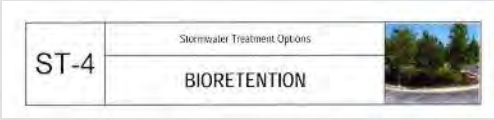
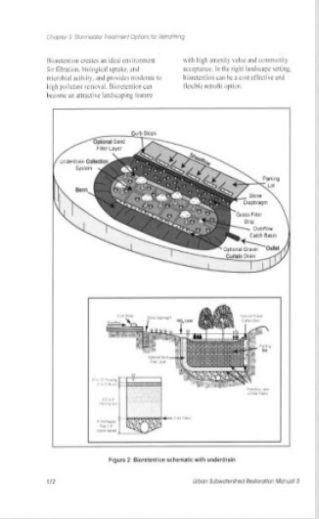



Figure 1: Bioretention created in a parking lot turn-around



FUTURE PLANS (FYE 2021 – 2022)

- Implement Urban/Suburban Structural BMPs
  - Review Ordinances for Applicability
    - Revise Ordinances if Needed
  - Identify Key Areas for Installation
  - Begin with Demonstration Projects
- Begin Restoration of Riparian Buffer Zones
- Review First Five Years of Monitoring Data
  - Assess Compliance Status with Load Requirements
  - Evaluate Validity of TMDL

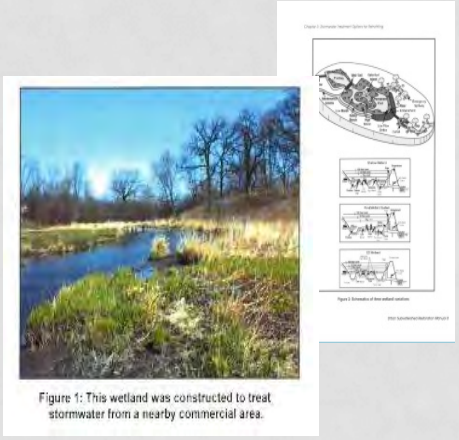
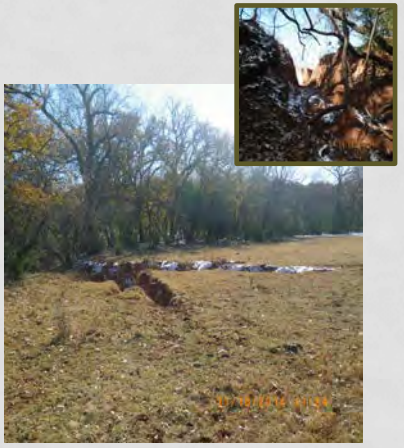
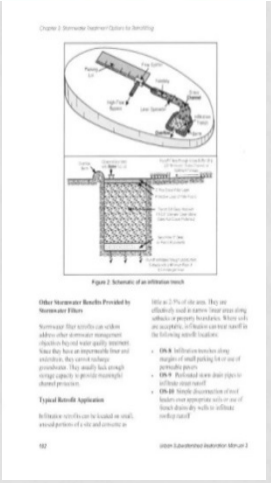


Figure 1: This wetland was constructed to treat stormwater from a nearby commercial area.



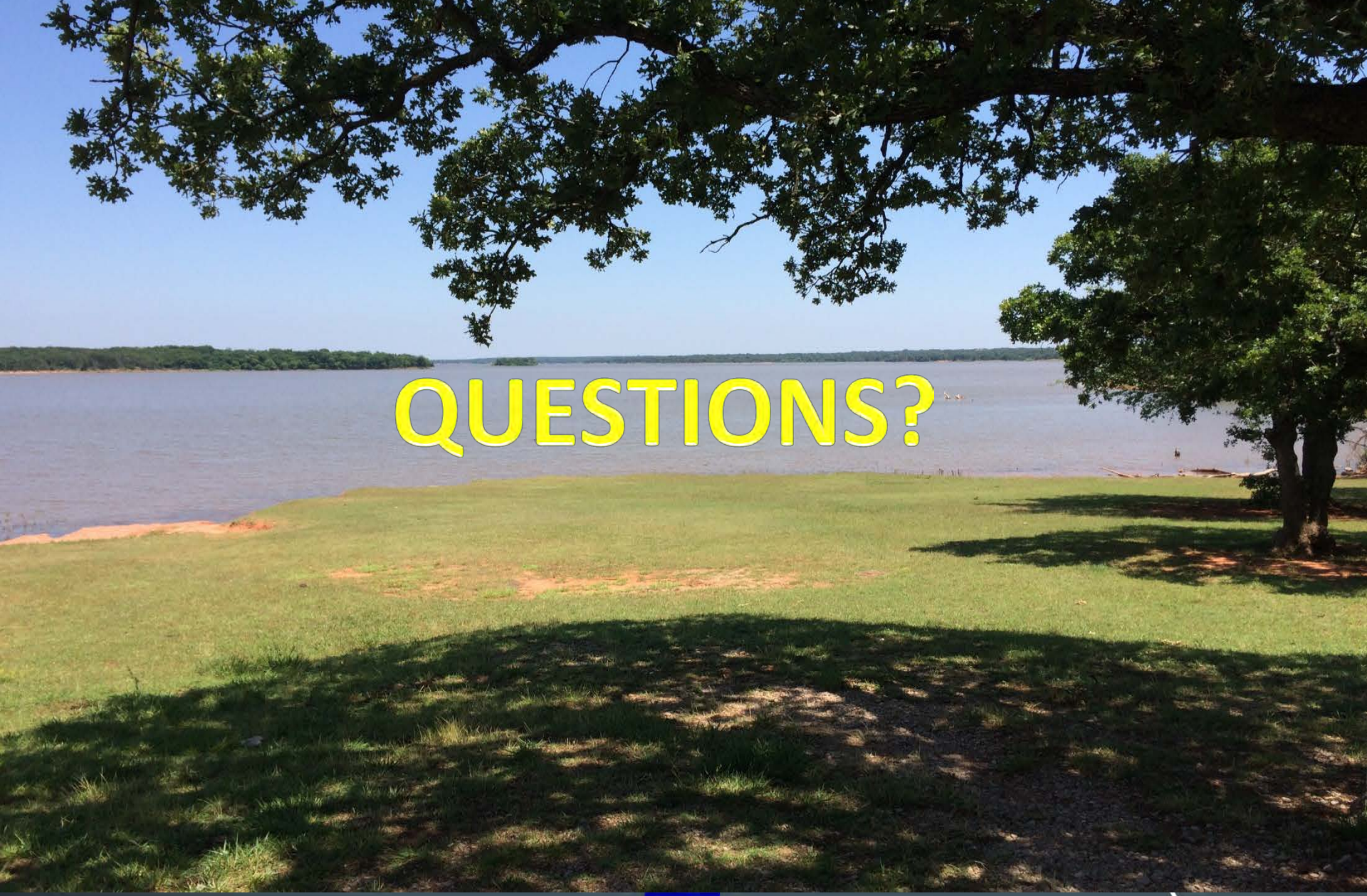
FUTURE PLANS (FYE 2022 – 2027)

- Continue Monitoring According to the Most Recent Revision of the Monitoring Plan
  - Maintain Compliance with the Most Current Version of the QAPP
- Complete Implementation of 50% of Agricultural BMPs
  - Target Key Sub-Watersheds as Identified in the Plan
- Implement 33% of Urban/Suburban Structural BMPs
  - Target Key Sub-Watersheds as Identified in the Plan



FUTURE PLANS (FYE 2022 – 2027)

- Begin Implementation of Remaining 50% of Agricultural BMPs
- Review Up to Ten Years of Monitoring Data
  - Assess Compliance Status with Load Requirements
  - Evaluate Validity of TMDL
- Revise Compliance Plan as Required


QUESTIONS?