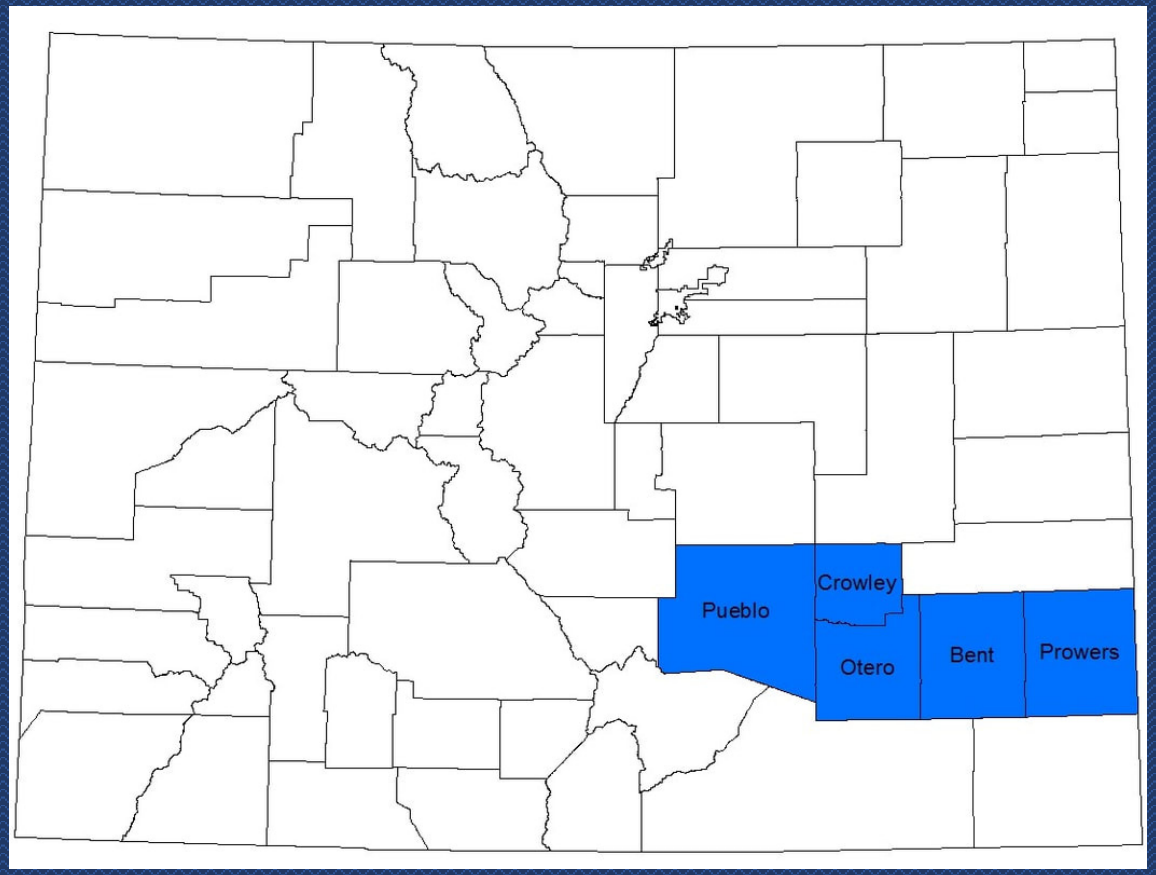


Lower Arkansas Valley
WATER CONSERVANCY DISTRICT
Serving Pueblo, Otero, Bent, Crowley, and Prowers Counties

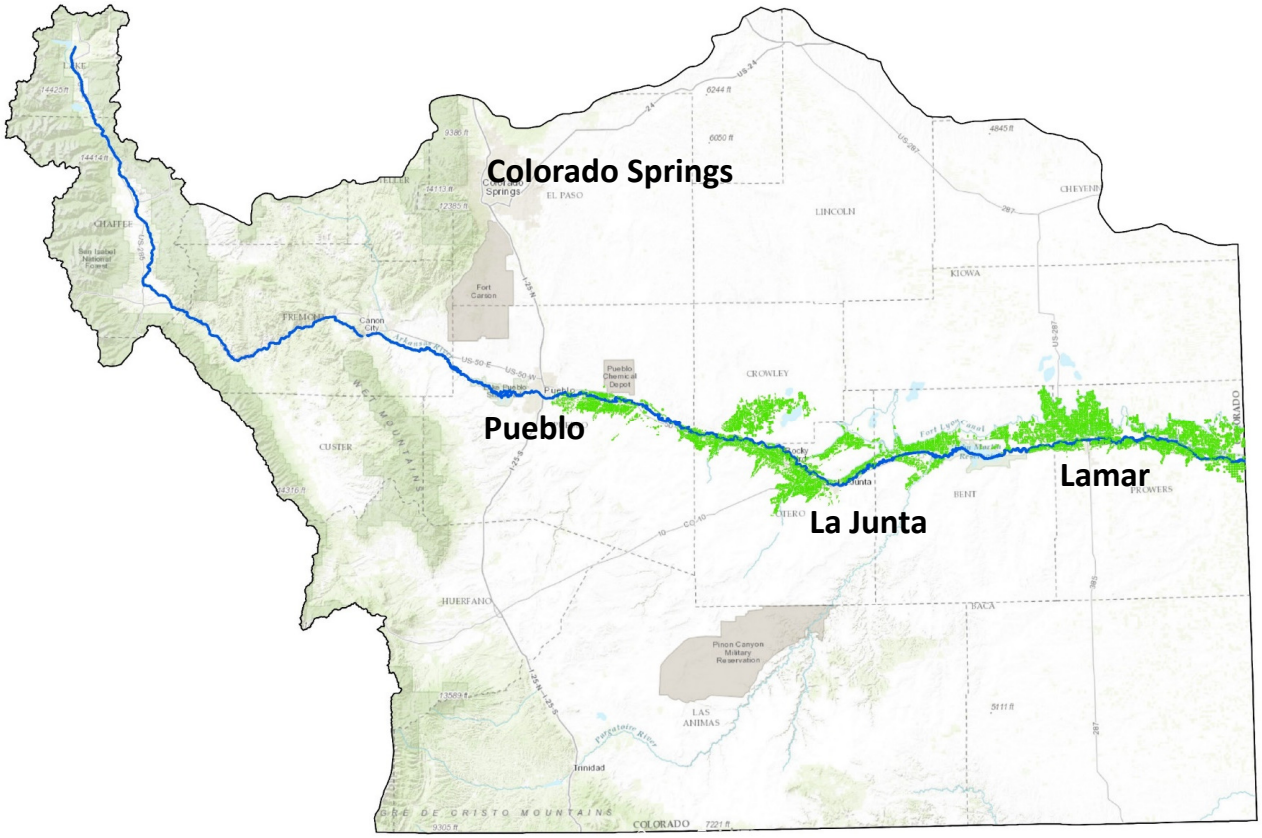
Lower Ark District Water Quality Projects Review

ARCA Committee Meetings
December 8, 2021

Jack Goble, P.E.
General Manager

Background

- Lower Ark followed CSU and other's WQ work
- Approached by CDPHE and CDA to implement a project below JMR to test the efficacy of BMPs
- After studying the issues and the potential benefits, agreed to become involved



Arkansas River Basin in Colorado

COLORADO'S SECTION 303(D) LIST

CODE OF COLORADO REGULATIONS *5 CCR 1002-93*
Water Quality Control Commission

WBID	Segment Description	Portion	Colorado's Monitoring & Evaluation Parameter(s)	Clean Water Act Section 303(d) Impairment	303(d) Priority
COARLA01a	Arkansas River, Fountain Creek to Colorado Canal headgate	all		*E. coli*	H
COARLA01b	Arkansas River, Colorado Canal headgate to John Martin Reservoir	all		Se, As, Mn	L
COARLA01c	Arkansas River, John Martin Reservoir to stateline	all		Se, U, As, Mn	H/H/L/L
COARLA02a	All tributaries to the Arkansas River from the Colorado Canal headgate to the	all	SO_4, Mn		
COARLA0					H
COARLA0					L
COARLA0			apa R		
COARLA0					L
COARLA05b	Purgutoire River, and the mainstem from source to Trinidad Reservoir.	all	Temperature	As	L
COARLA05b	Lower North, Middle and South Fork of the Purgutoire River, and the mainstem from source to Trinidad Reservoir.	Long Canyon	Mn		
COARLA06a	All Tributaries to the Purgatoire River from the source to Interstate 25	Apache Canyon		Aquatic Life (provisional)	M
COARLA06a	All Tributaries to the Purgatoire River from the source to Interstate 25	Reilly Canyon	Temperature		

34
Se
Selenium
78.09

92
U
Uranium
238.0289

Best Management Practices (BMPs)

BMPs recommended by Colorado State University:

- Canal/Ditch Sealing and Lining
- Reduced Irrigation Application (sprinklers and drip)
- Lease-Fallowing
- Enhance Stream Riparian Areas
- Nitrogen Fertilizer Reduction

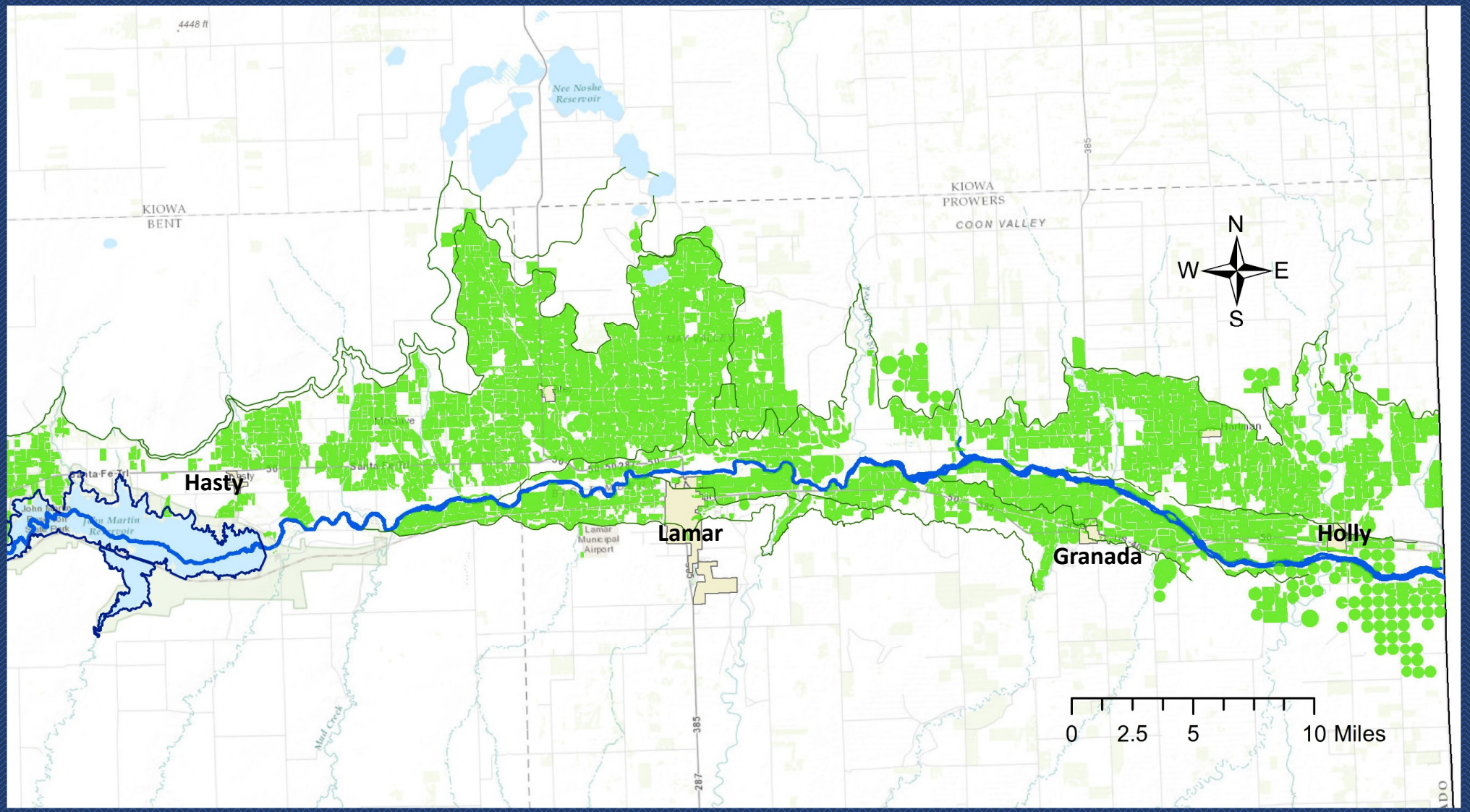
Initial Project – The Objective

Objective: To evaluate the efficacy of BMPs to improve water quality.

- We reviewed CSU and other's research on recommended BMPs:
  - Canal/Ditch Sealing and Lining
  - Reduced Irrigation Application (sprinklers and drip)
  - Lease-Fallowing
  - Enhance Stream Riparian Areas
  - Nitrogen Fertilizer Reduction

Initial Project – The Process

1. Locate a project site between JMR and the state line that had little to no improvements.


Hasty
Lamar
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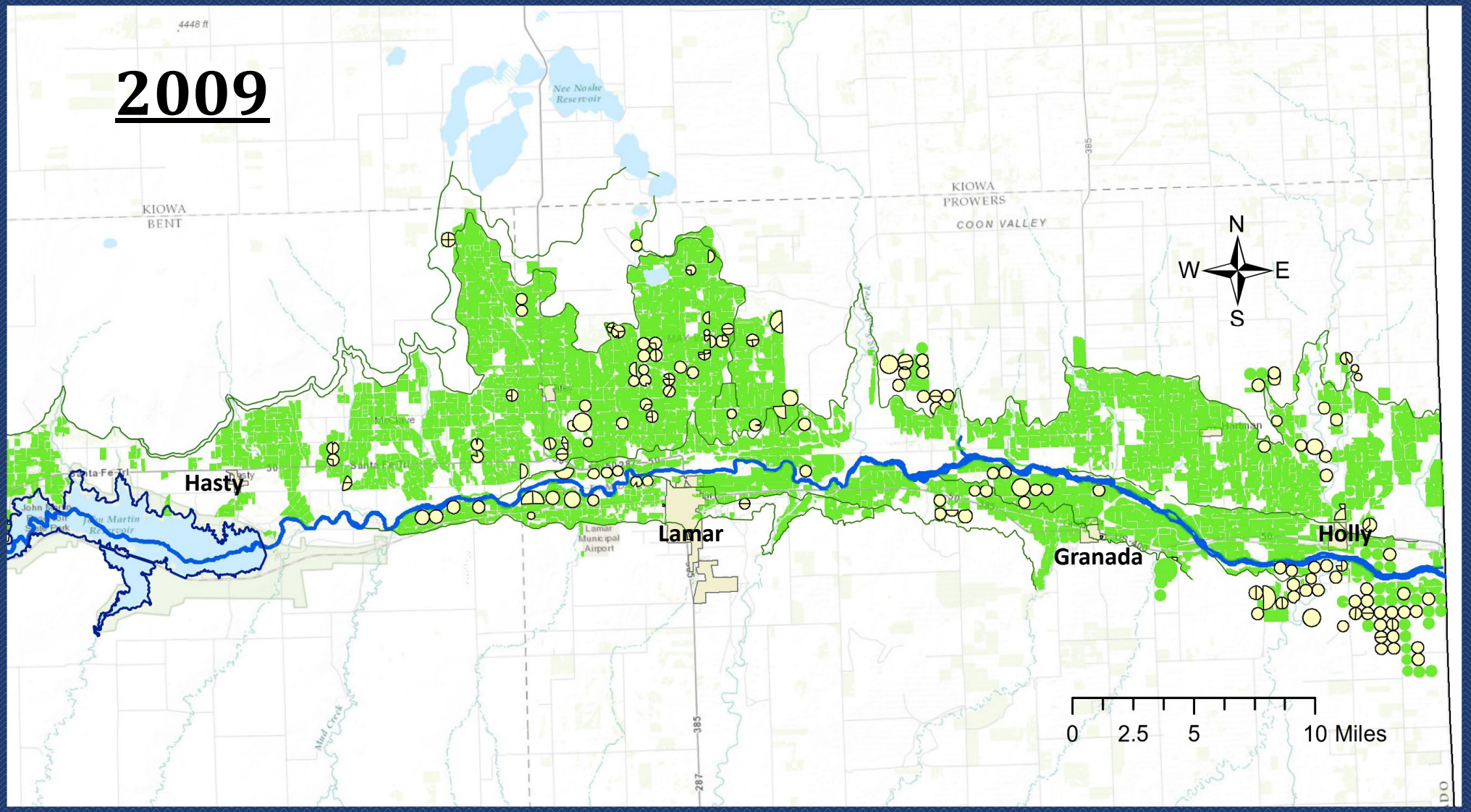
KIOWA
BENT
KIOWA
PROWERS
COON VALLEY
Nee Noshe Reservoir
John Martin Reservoir
Lamar Municipal Airport
Mud Creek
N
W
E
S
0
2.5
5
10 Miles

2009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Granada
Holly
Lamar Municipal Airport
John Martin Reservoir
Mud Creek
385
287
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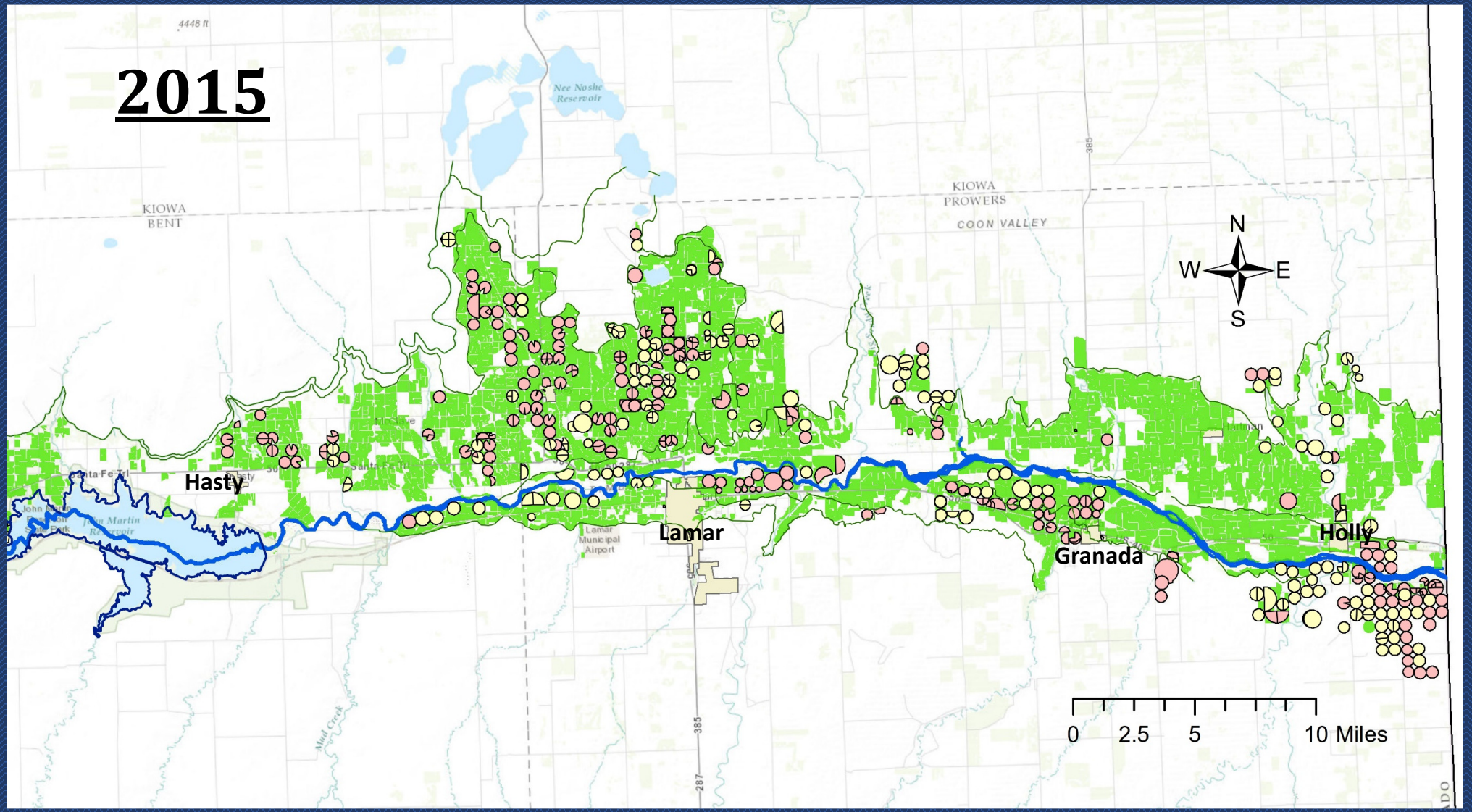
5
10 Miles

2015


Nee Noshe Reservoir
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Lamar Municipal Airport
John Martin Reservoir
Mud Creek
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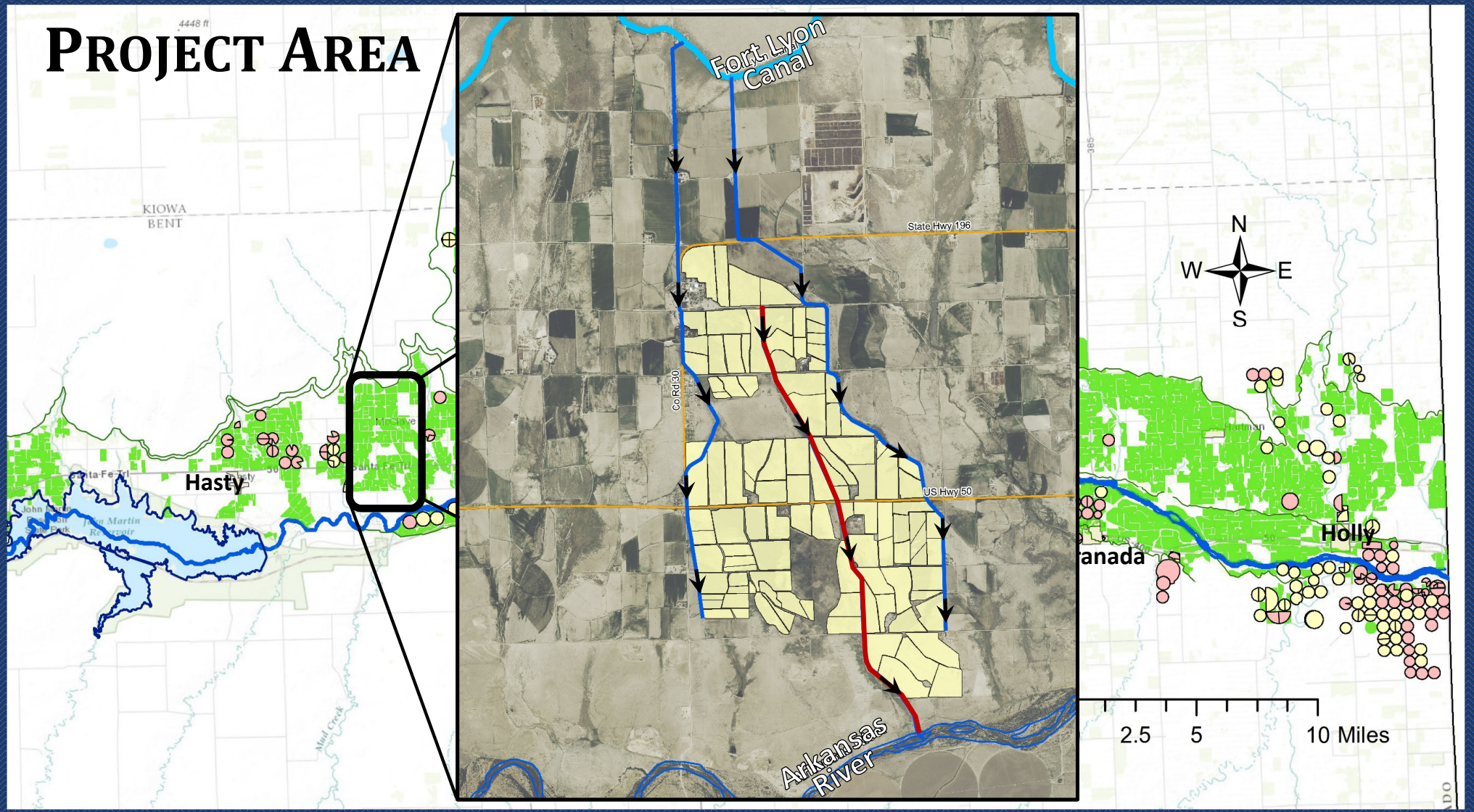
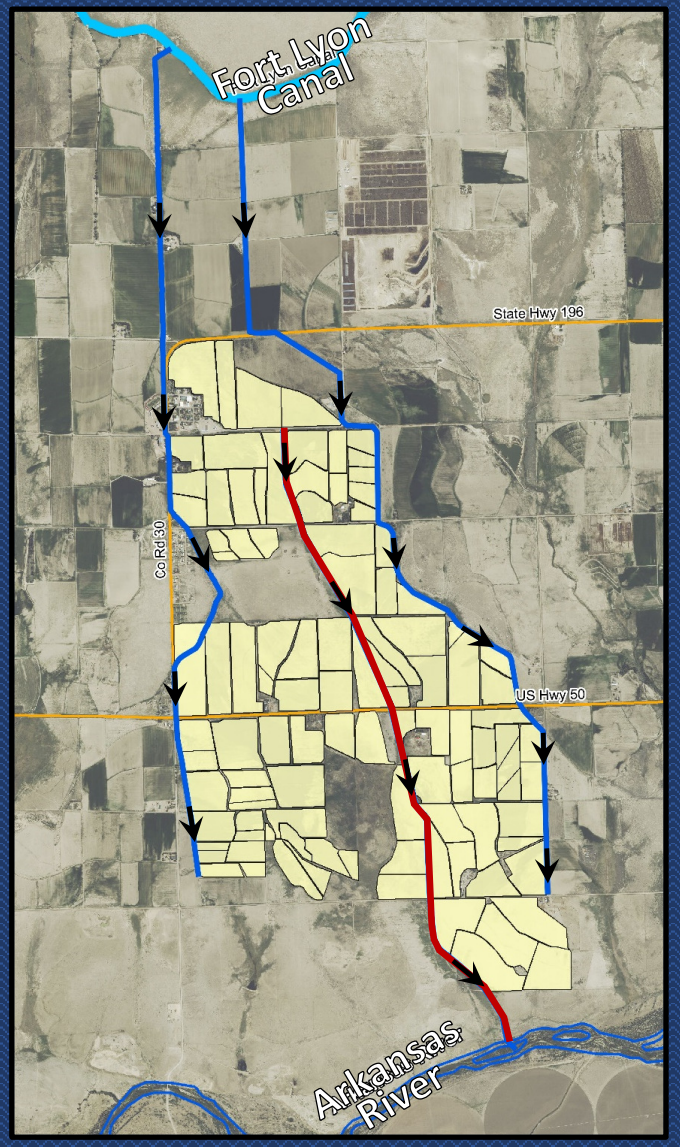
10 Miles

Project Area



Initial Project – The Process

1. Locate a project site between JMR and the state line that had little to no improvements.
2. Collect baseline water quality data.
   - Monitor/sample surface and groundwater.



Flume Measuring Supply

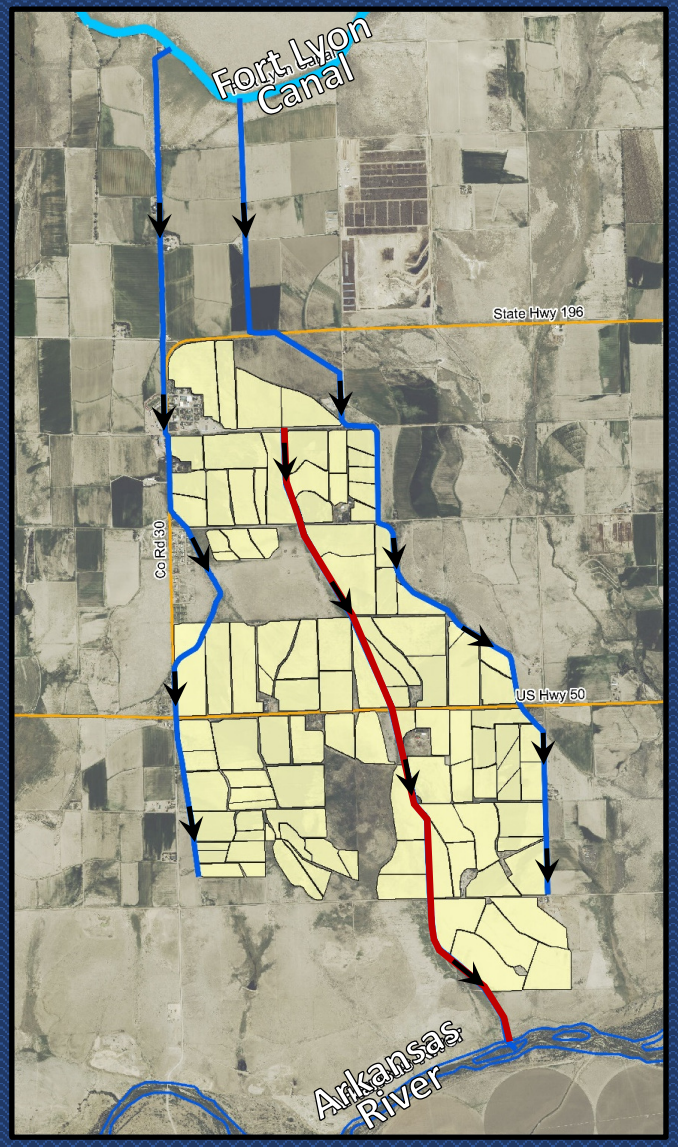
Flume Measuring Tailwater

Monitoring and Sampling

Groundwater Water Sampling

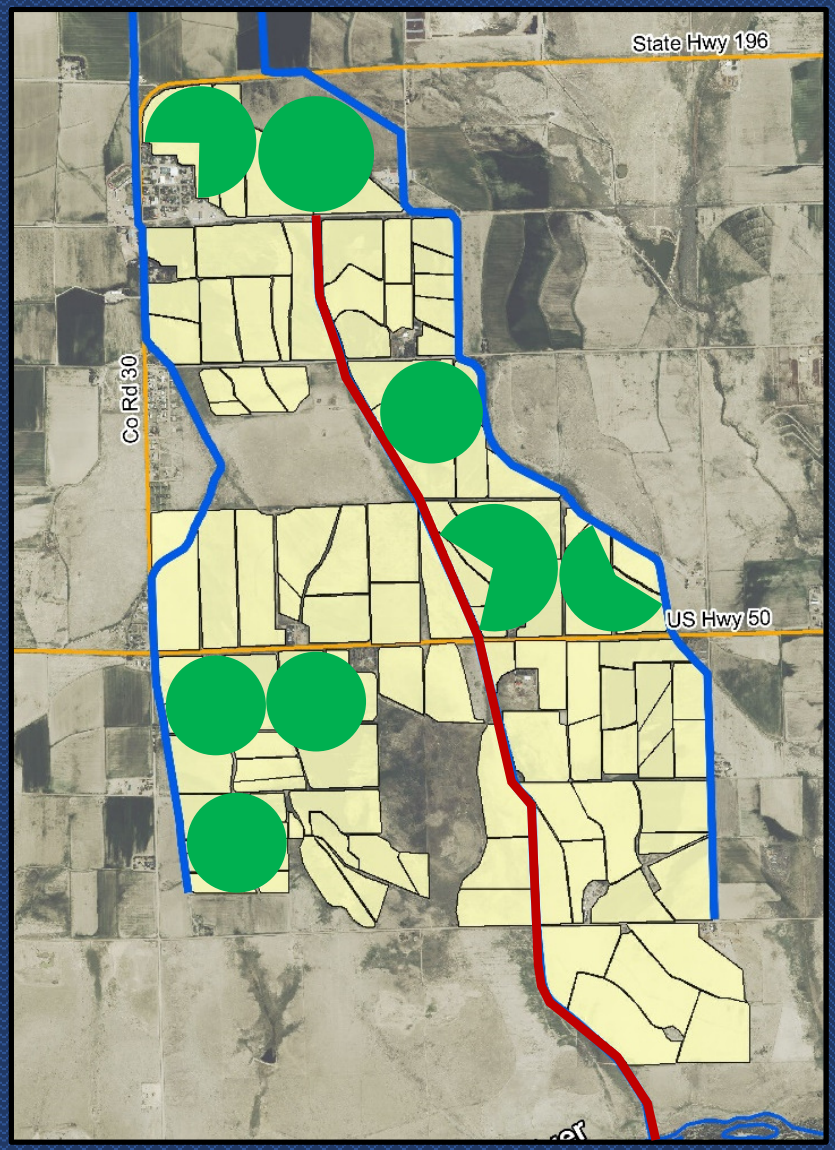
Initial Project – The Process

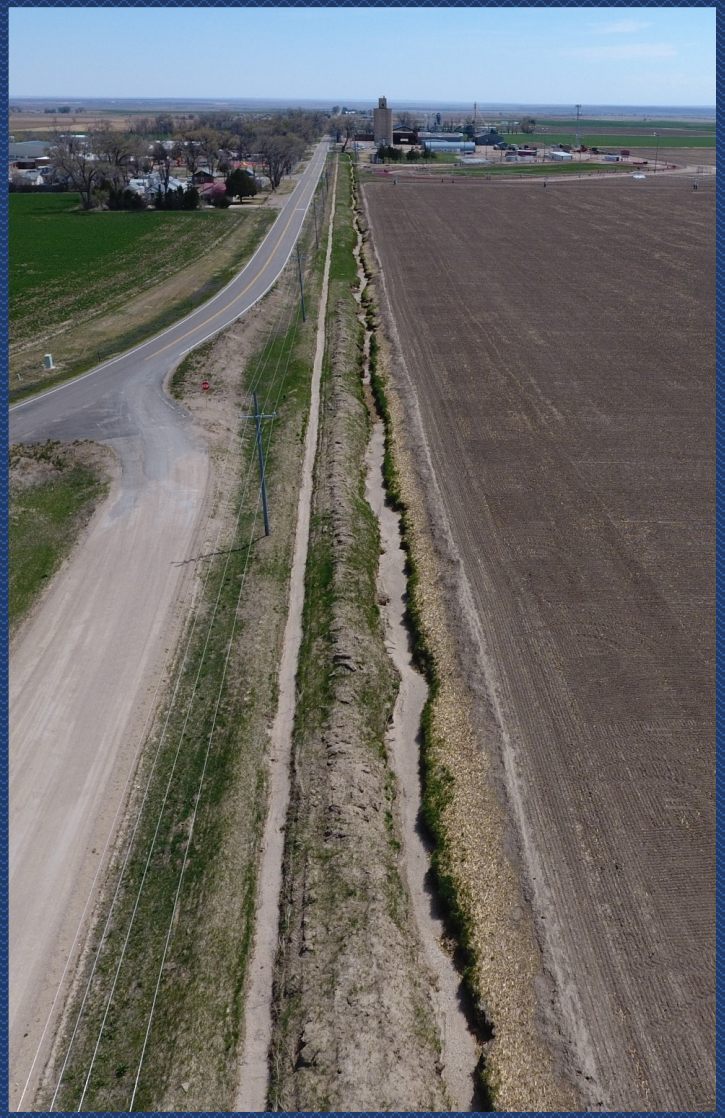
1. Locate a project site between JMR and the state line that had little to no improvements.
2. Collect baseline water quality data.
   - Monitor/sample surface and groundwater.
3. Implement BMPs.



BMPs Implemented

- Eight sprinklers installed
- Two lateral ditches replaced with 2,500 L.F. of 36” pipe





Before: Two Ditches

After: One Pipe

Before

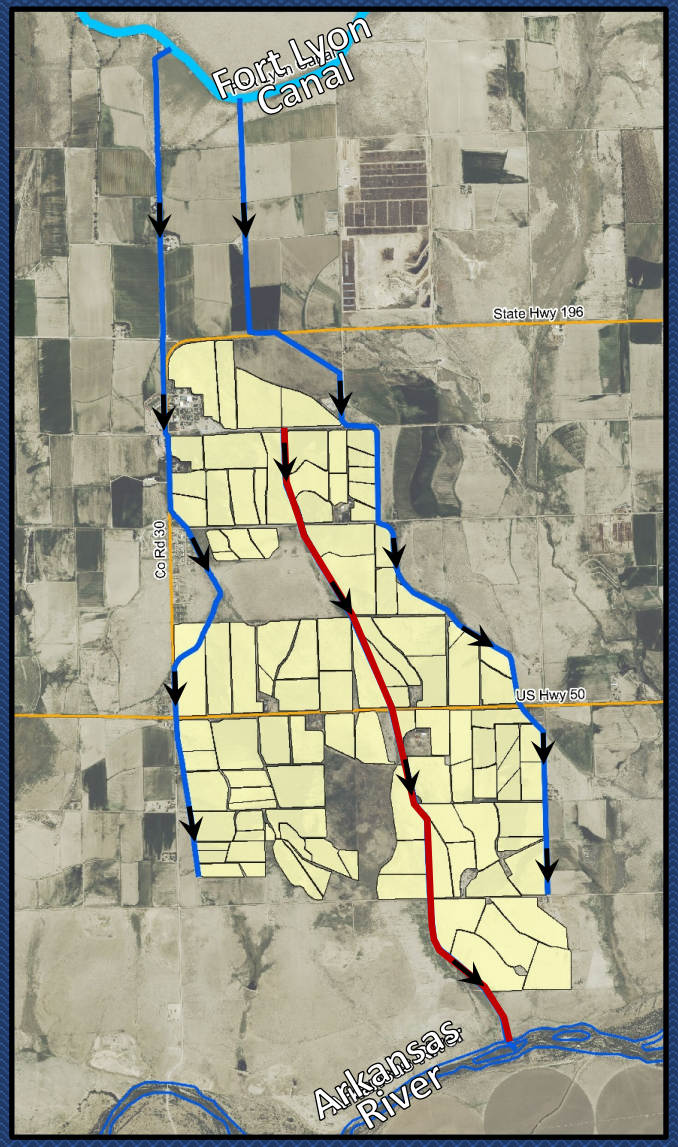
After

Before

After

Initial Project – The Process

1. Locate a project site between JMR and the state line that had little to no improvements.
2. Collect baseline water quality data.
   - Monitor/sample surface and groundwater.
3. Implement BMPs.
4. Continue to monitor and sample looking for any changes in water quality.
5. Evaluate the impact of the BMPs on WQ.



Other Water Quality Projects

- Three 319 Grants from CDPHE:
  - Total Budget: $3.3 million
  - BMPs to be installed/implemented:
    - Sprinkler Pond Linings x 7
    - Sprinkler with a Lined Pond
    - Lateral Ditch and Canal Lining x 3
    - Rotational-Fallowing Projects x 2
    - Riparian Buffer Zones x 2
    - Nitrogen Fertilizer Reduction x 2
    - Wetland Restoration
    - Various Soil Health Improvement Practices

Supplemental Environmental Project

- Settlement from Colorado Springs stormwater lawsuit:
  - Total Budget: $1.0 million
  - BMPs to be installed/implemented:
    - Sprinkler Pond Linings x 2
    - Sprinkler or Drip System x 2
    - Lateral Ditch Lining x 2
    - Rotational-Fallowing Projects
    - Riparian Buffer Zones x 3
    - Nitrogen Fertilizer Reduction
    - Wetland Restoration
    - Various Soil Health Improvement Practices

Final Thoughts

- Sprinklers, pond linings, drip irrigation systems, and ditch linings are all subject to Colorado's Irrigation Improvement Rules are/will be included in a Rule 10 Plan to maintain historical return flows.
- Sprinkler installations have been steady
  - 317 sprinklers covering over 33k acres in Lower Ark's Rule 10 Plans
  - Roughly 80% of these have a head stabilization pond
  - Farmers are interested in lining these ponds, but pond seepage acts as a credit against replacement obligations.
- Lease-Fallowing is likely to continue to increase, but lack of storage is a significant limitation.
- Additional storage will be required to implement these BMPs on a large scale.

QUESTIONS?