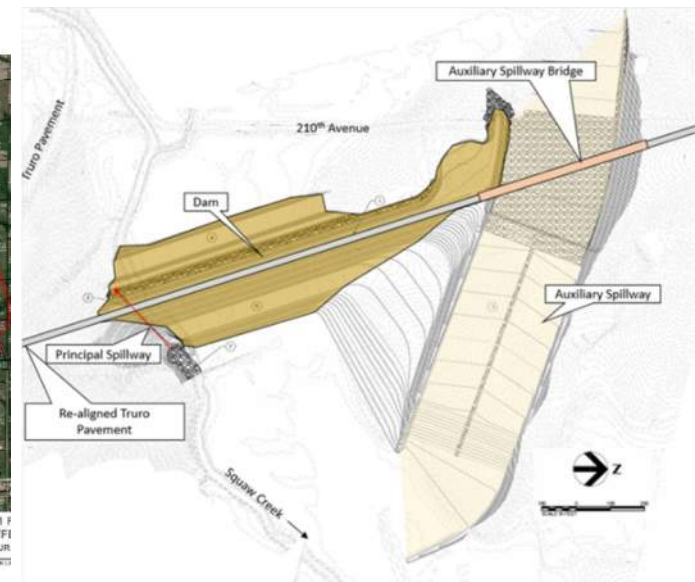
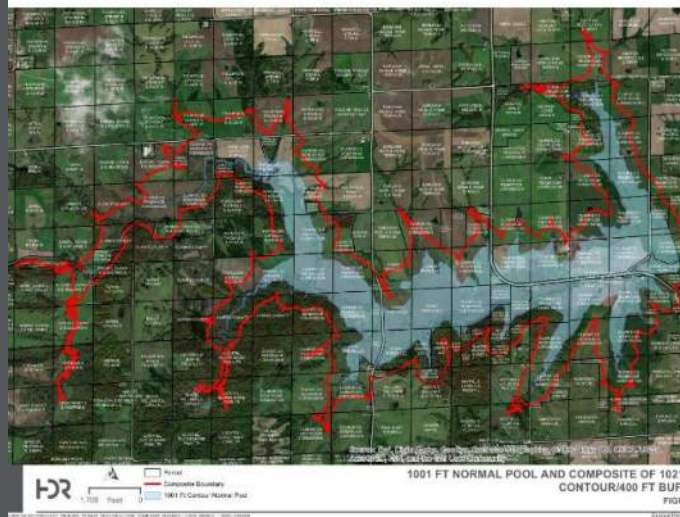


# Clarke County Water Supply Project

Clarke County Reservoir Commission

2024 Annual Meeting



July 25, 2024

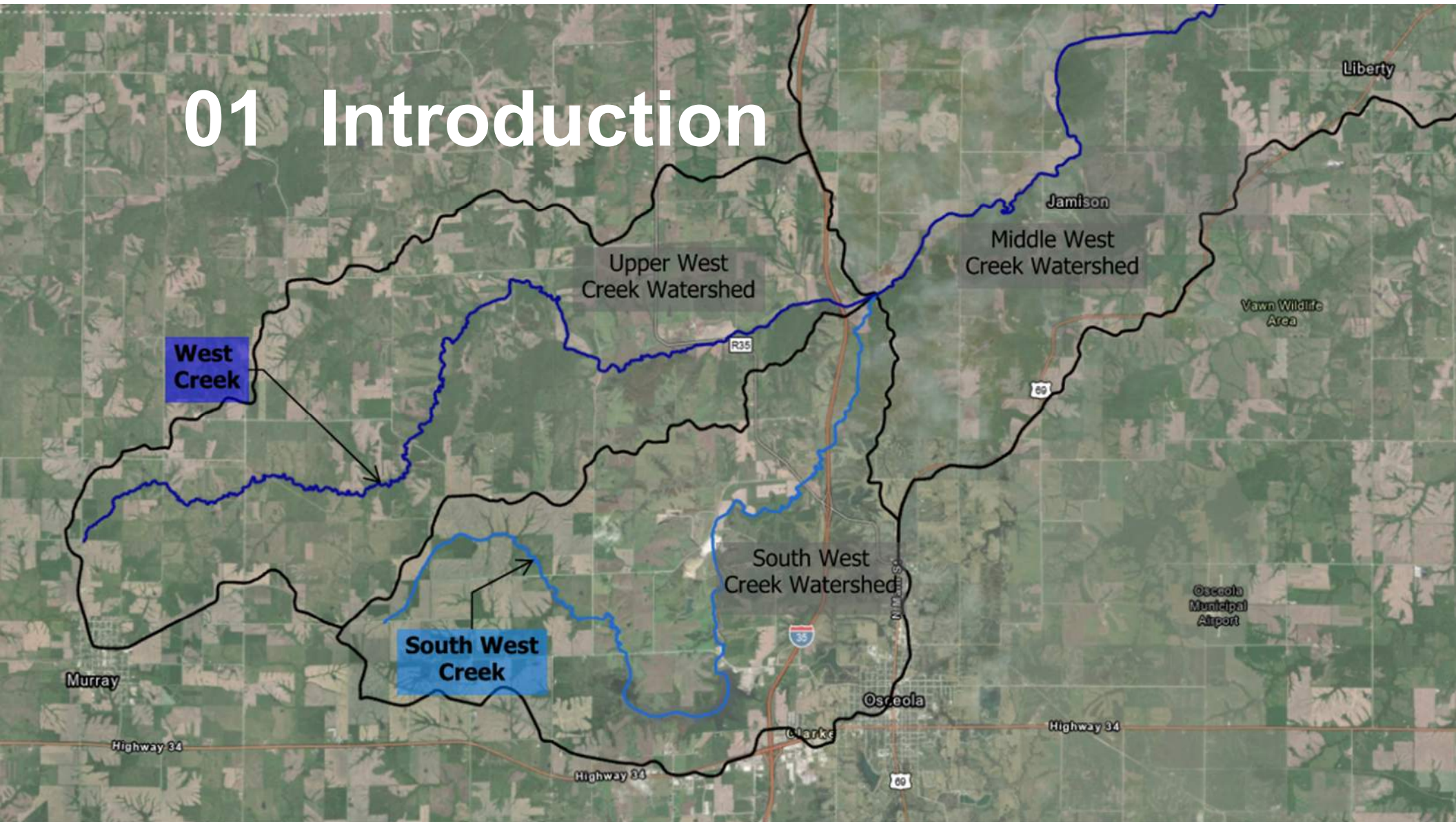
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## Agenda

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- 01** Introduction
- 02** Background
- 03** Alternatives Development
- 04** Draft Design Overview
- 05** Drought Emergency
- 06** NRCS WFPO Program

# 01 Introduction



# 02 Background



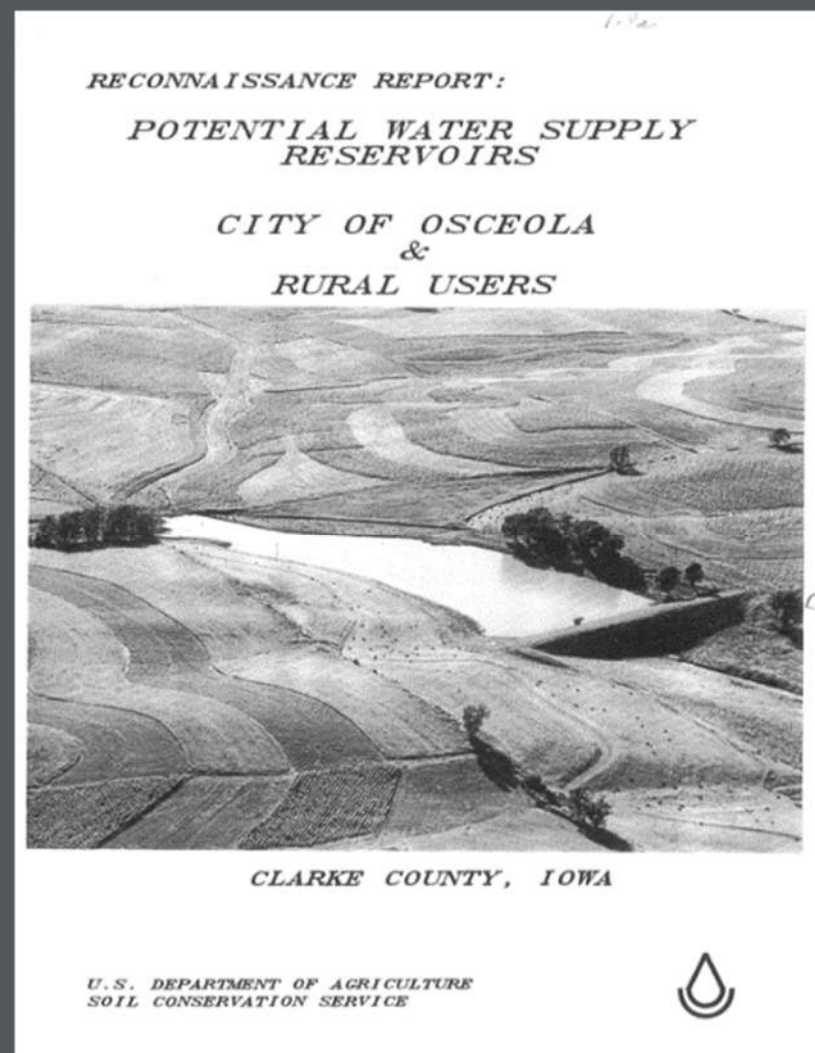
# Purpose and Need

- Recognized Federal Purpose –  
Rural/Agricultural Water Supply
- Project Need –
  - The project is needed to secure a reliable supply of water that provides at least 1.87 million gallons per day for the cities of Osceola, Murray, and Woodburn, Iowa, and for the Clarke County service area of Southern Iowa Rural Water Association (SIRWA)
  - Clarke County has experienced at least four serious droughts since the 1980s
  - Osceola Water Works implemented a Water Emergency in October of 2023, at the time there was predicted to be less than a year's supply of water available



# Project History

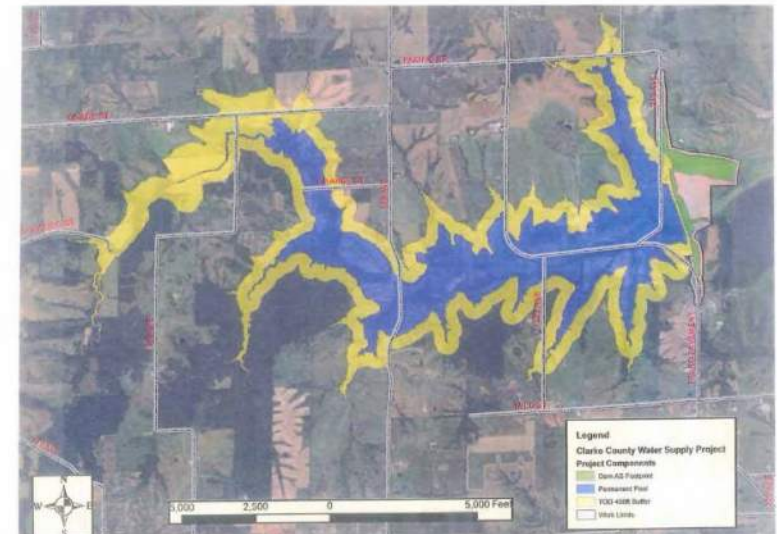
- **1991:** Reconnaissance Report for Potential Water Supply Reservoirs in Clarke County by USDA SCS
- **2011:** Original Clarke County Water Supply Plan-EIS by USDA NRCS
- **2013:** Updated Clarke County Water Supply Plan-EIS by CCRC
- **2015:** Legislation for Changes to Iowa Law for Use of Eminent Domain for Land Acquisition
- **2016:** Updated Water Demands, Hydrology & Hydraulics, Reservoir Sizing



# Project History

- **2014-19:** Legal Challenges, Land Acquisition by CCRC
- **2014-19:** Preliminary Engineering Report for Funding Applications
- **2020:** HDR completed Draft Design Report
- **2021:** New planning agreement with NRCS
- **2024:** New Watershed Plan-EIS

CLARKE COUNTY WATER SUPPLY  
Plan - Environmental Impact Statement  
Clarke County, Iowa  
August 2013



Clarke County Reservoir Commission  
With Assistance from  
U.S. Department of Agriculture  
Natural Resources Conservation Service and  
Southern Iowa Resource Conservation and Development Area Inc.

CCRC-00816

# **03 Alternatives Development**



# Screening Criteria

- Purpose and Need
  - Total Raw Water Supply of a minimum of 1.87 MGD
- Reasonableness (NEPA)
  - Economically and Technically Feasible
  - Common Sense
- Practicability (Section 404 (b)(1))
  - Logistics
  - Cost
  - Technology

Entity	2022 Finished Avg Demand (MGD)	2022 Raw Avg Demand (MGD)	2050 Finished Avg Demand (MGD)	2050 Raw Avg Demand (MGD)
City of Osceola	0.94	1.00	1.18	1.26
SIRWA	0.42	0.45	0.89	0.95
Osceola Business Park	NA	NA	0.43	0.46
<b>Total (MGD)</b>	<b>1.36</b>	<b>1.45</b>	<b>2.49</b>	<b>2.67</b>
<b>New Raw Water Supply</b>		<b>0.65</b>		<b>1.87</b>

## **Range of Alternatives**

- No Action/Future Without Federal Investment
- New Raw Water Reservoir
  - Single Source
  - Multi-Source
- Expansion of Existing West Lake
- Purchase Water and Pipeline from Another Water Utility
- Groundwater Well Field

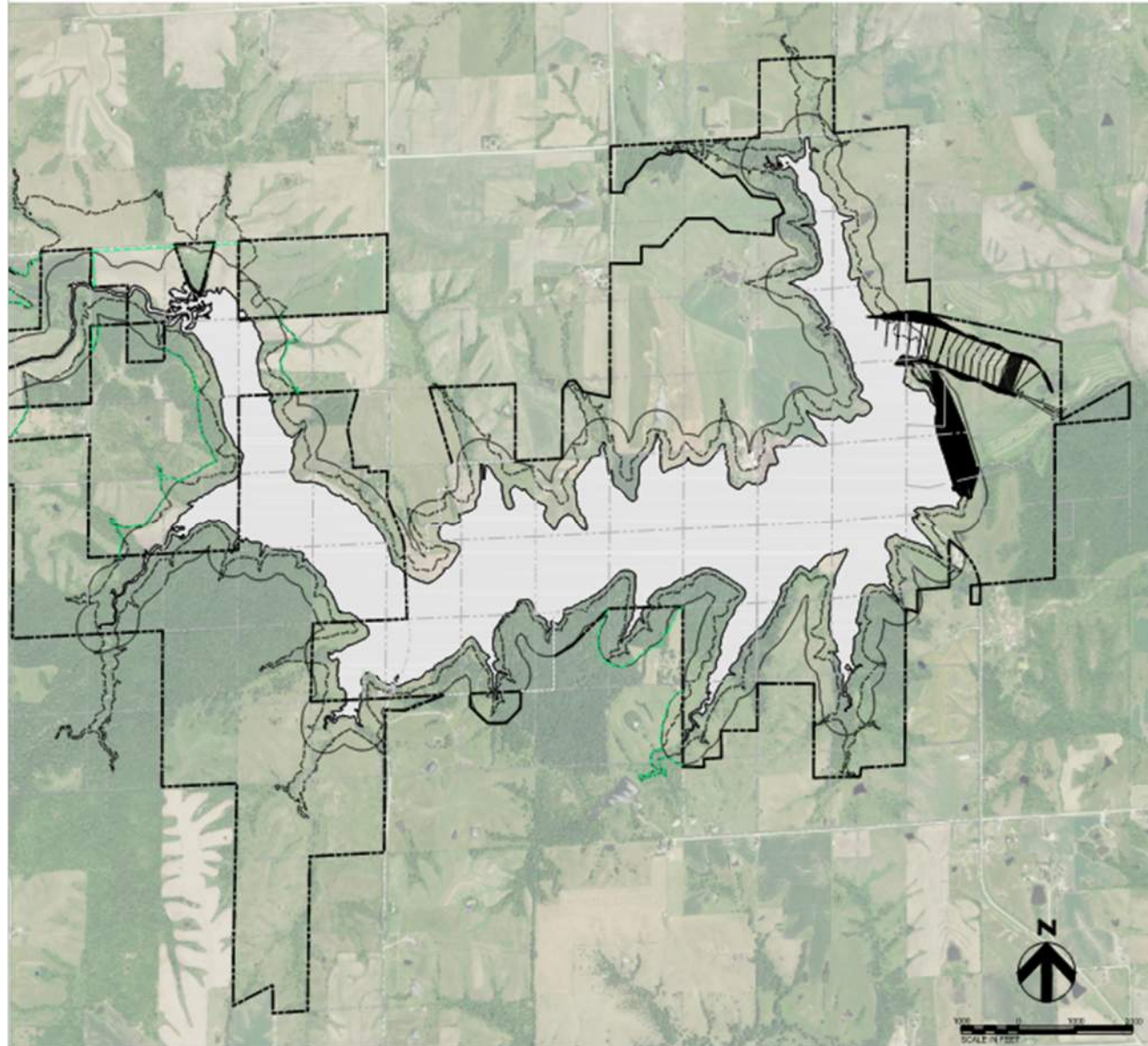
# Screening Results

Alternative	Disposition
No Action/Future Without Federal Investment	Carried Forward
New Raw Water Reservoir	
Single Source	Single Source – Carried Forward
Multiple Source	Multiple Source – Eliminated based on cost
Expansion of Existing West Lake	Eliminated due to insufficient supply
Purchase Water and Pipeline from Another Water Utility	Eliminated based on logistics
Groundwater Well Field	Eliminated based on Purpose and Need

# CCRC Preferred Alternative: Site 4B

## Proposed CCRC Site 4B

- Drainage Area = 16,500 acres
- Normal Pool Area = 790 acres
- DAPA Ratio = 20.9 : 1
- Normal Pool Elevation = 1001.0
- Bottom Intake Elevation = 984.0
- Total Volume Available = 11,030 acre-feet
- Safe Withdrawal Capacity = 2.0 MGD

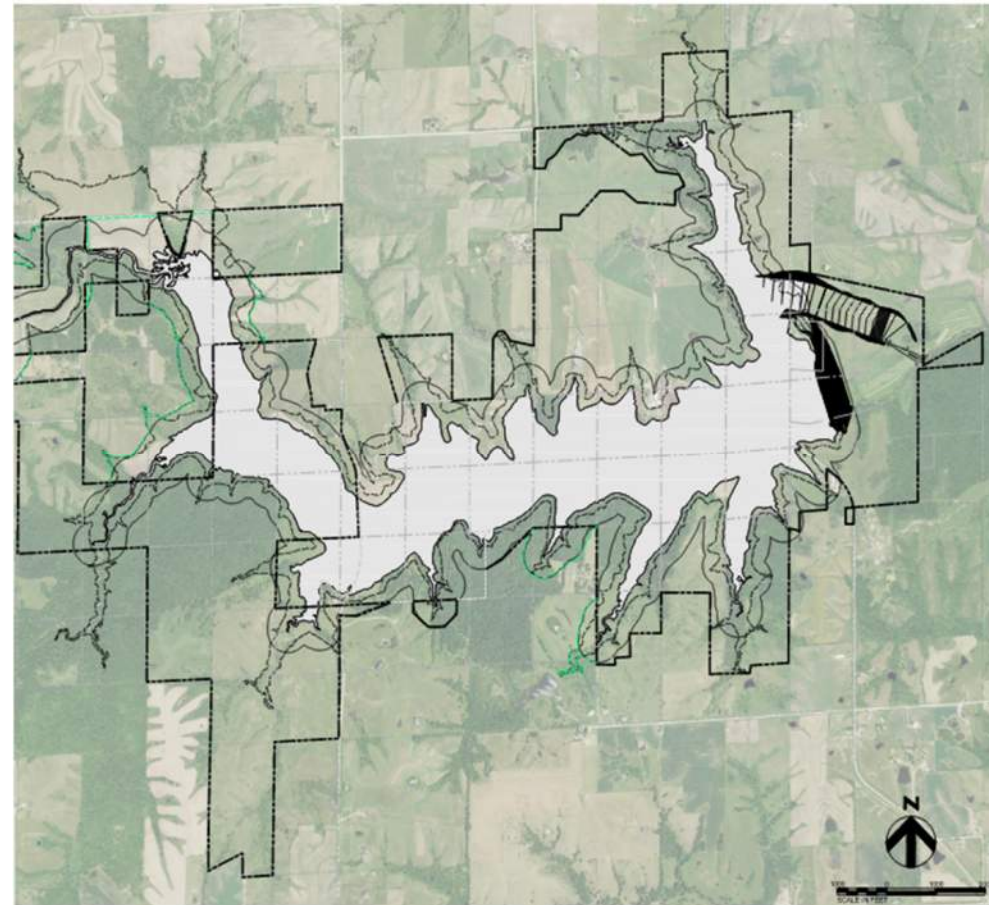


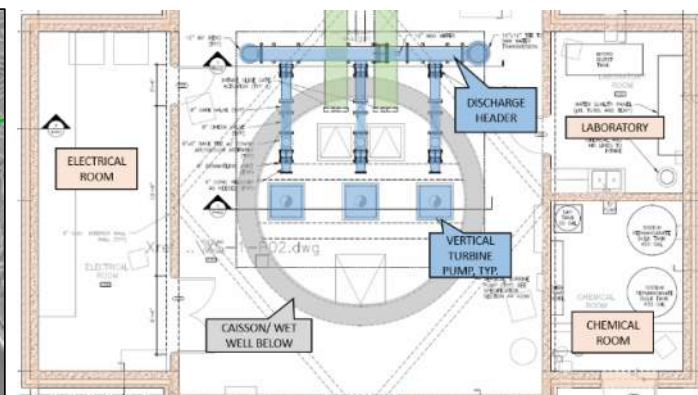
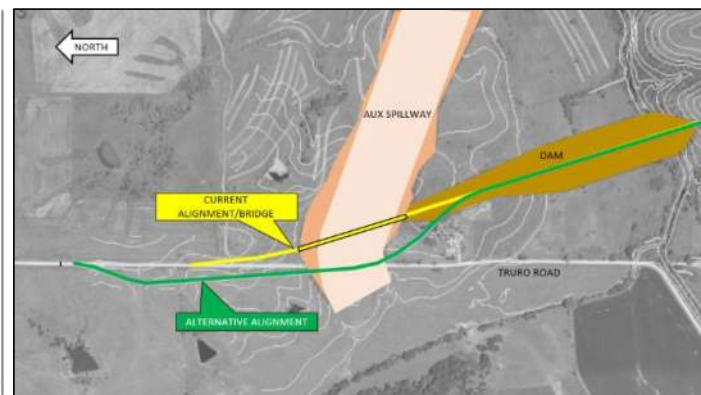
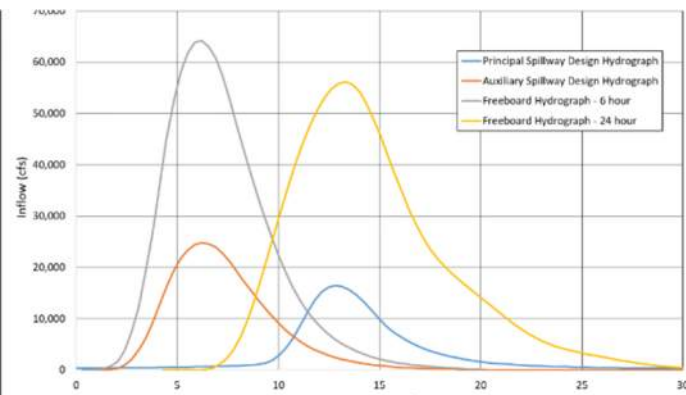
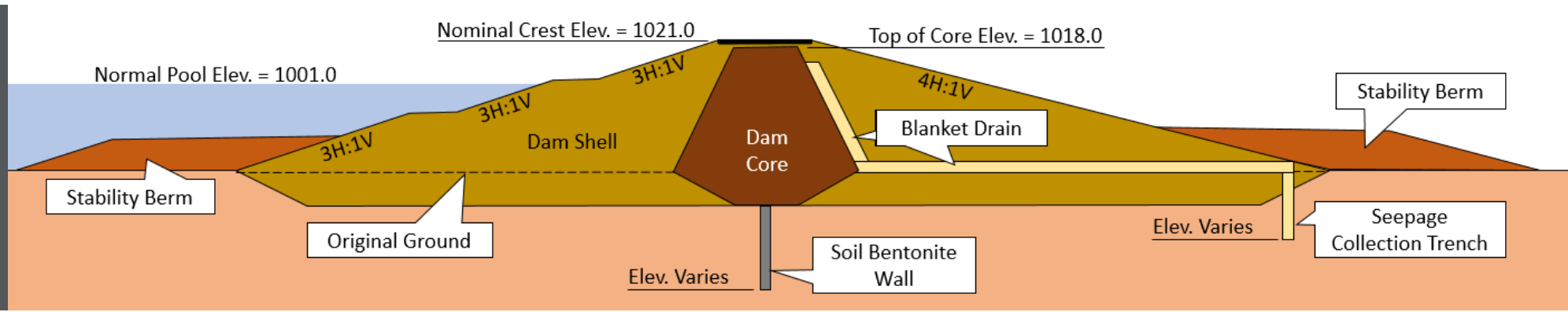


# 04 Design Overview

# Clarke County Reservoir Draft Design (2020)

- Objectives of the Draft Design:
  - Collect geotechnical and survey data
  - Analyze and advance design of major project features
  - Update project construction cost estimates
  - Evaluate permitting requirements
  - Identify issues for Final Design Phase
- Key Features:
  - Principal spillway is designed to pass the 100-year flood
  - Design as high hazard dam

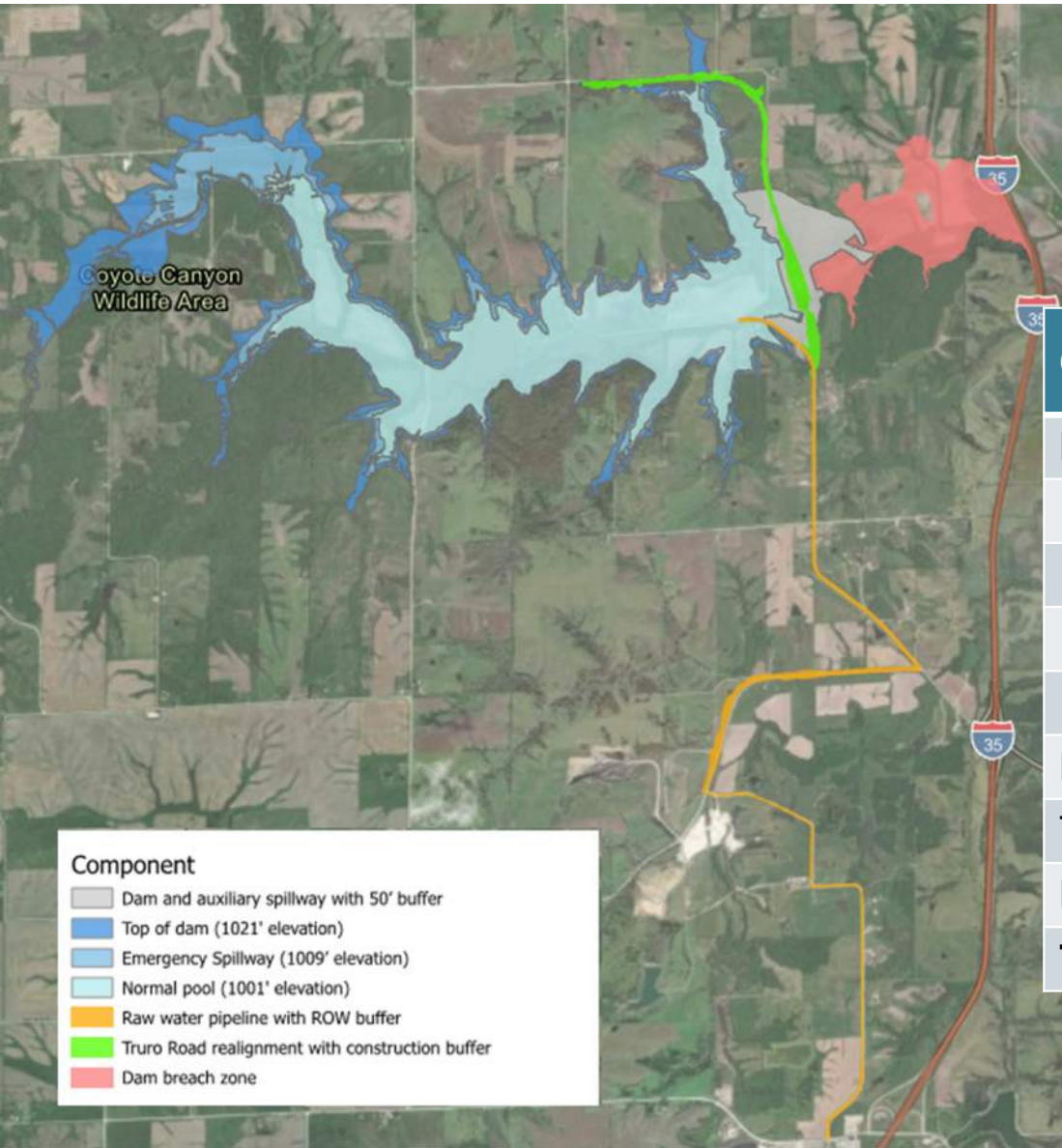




## Draft Design - Major Project Features

Geotechnical Investigation & Design, Hydrologic & Hydraulic Evaluation, Roadway Design, Raw Water Intake & Pipeline

# Area of Potential Effect: Reservoir at Site 4B



Component	
<span style="display:inline-block; width:15px; height:10px; background-color:grey; border:1px solid black;"></span>	Dam and auxiliary spillway with 50' buffer
<span style="display:inline-block; width:15px; height:10px; background-color:blue; border:1px solid black;"></span>	Top of dam (1021' elevation)
<span style="display:inline-block; width:15px; height:10px; background-color:lightblue; border:1px solid black;"></span>	Emergency Spillway (1009' elevation)
<span style="display:inline-block; width:15px; height:10px; background-color:cyan; border:1px solid black;"></span>	Normal pool (1001' elevation)
<span style="display:inline-block; width:15px; height:10px; background-color:yellow; border:1px solid black;"></span>	Raw water pipeline with ROW buffer
<span style="display:inline-block; width:15px; height:10px; background-color:limegreen; border:1px solid black;"></span>	Truro Road realignment with construction buffer
<span style="display:inline-block; width:15px; height:10px; background-color:red; border:1px solid black;"></span>	Dam breach zone

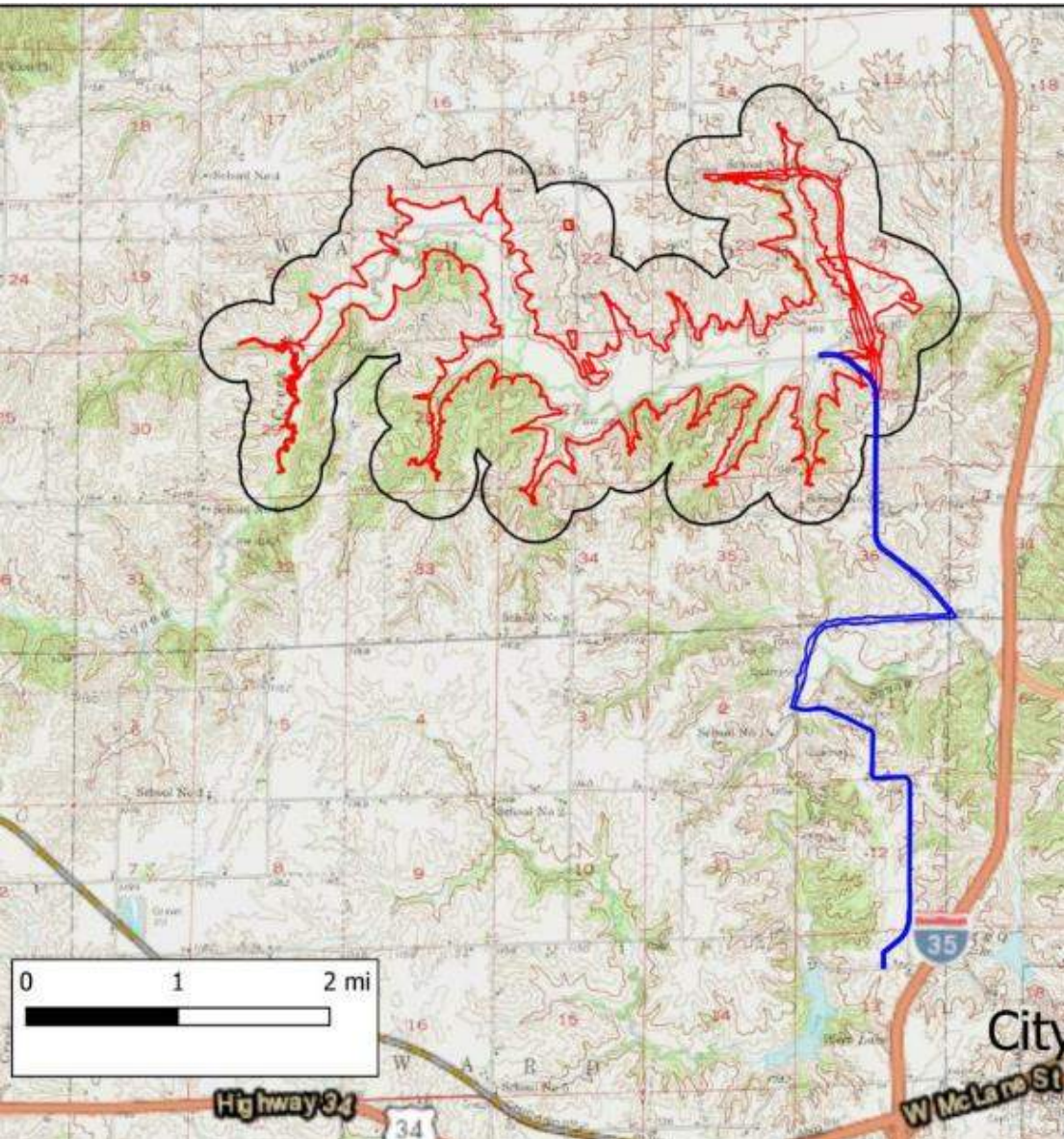
Component	Area (acres)
Dam and auxiliary spillway w/ 50' buffer	128
Impoundment area	
Top of dam (1021' elevation)	1,494
Emergency spillway (1009' elevation)	1,057
Normal pool (1001' elevation)	790
Raw water supply pipeline w/ ROW buffer	75.4
Truro Road realignment w/ construction buffer	57.1
Dam breach zone	251
<b>Total*</b>	<b>1,912</b>

\* Component areas overlap, total acreage is not the sum of the parts.



## Area of Potential Effect: Reservoir at Site 4B

- A quarter mile indirect effects buffer is included for architectural survey and was surveyed at reconnaissance level.



# Wetland and Stream Mitigation

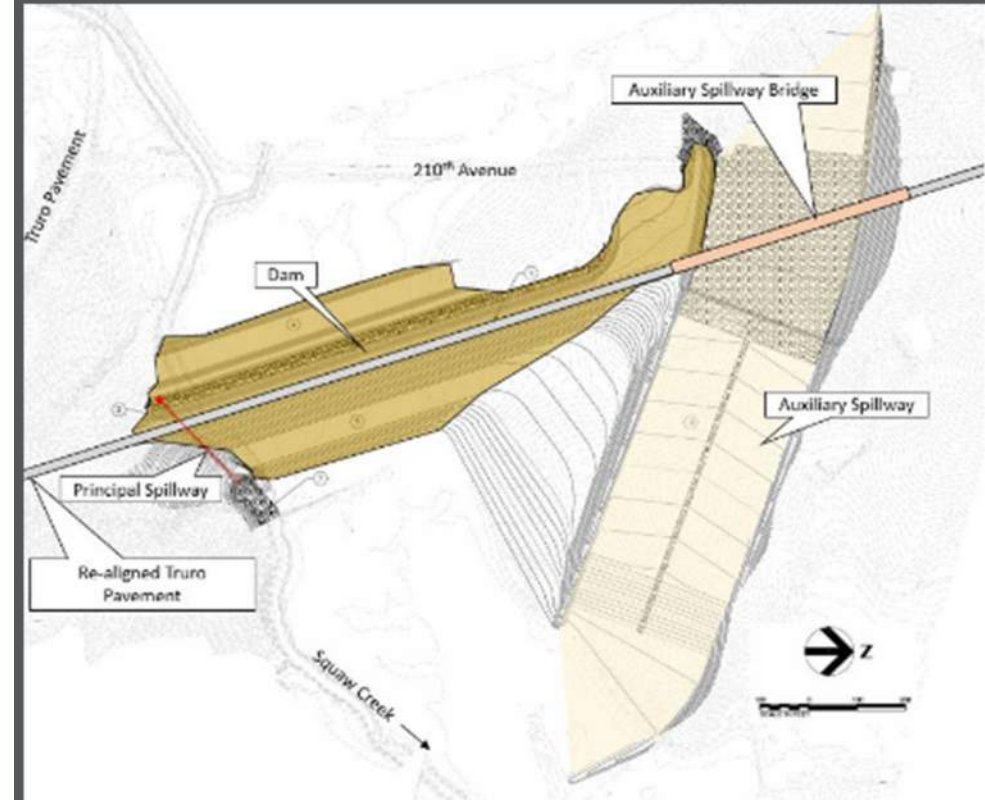
- Wetland delineation and stream assessment completed for project impacts.
- Mitigation sites are being screened.
- When sites are determined cultural resources surveys will need to be completed.

Wetland Type	Acre
PEMA/C	44.56
PEMF	1.17
PFOA	3.22
PSSA	2.89
WIAS	0.40
<b>Total</b>	<b>52.24</b>

Impact Type	Stream Type	Linear Feet (ft)
Complete Loss	Intermittent	2,698.2
	Perennial	840.2
Impoundment	Ephemeral	13,617.3
	Intermittent	31,101.4
	Perennial	26,457.6
Temporary	Intermittent	45.1
	Perennial	438.9
<b>Total Stream</b>		<b>75,198.7</b>

# Project Timeline

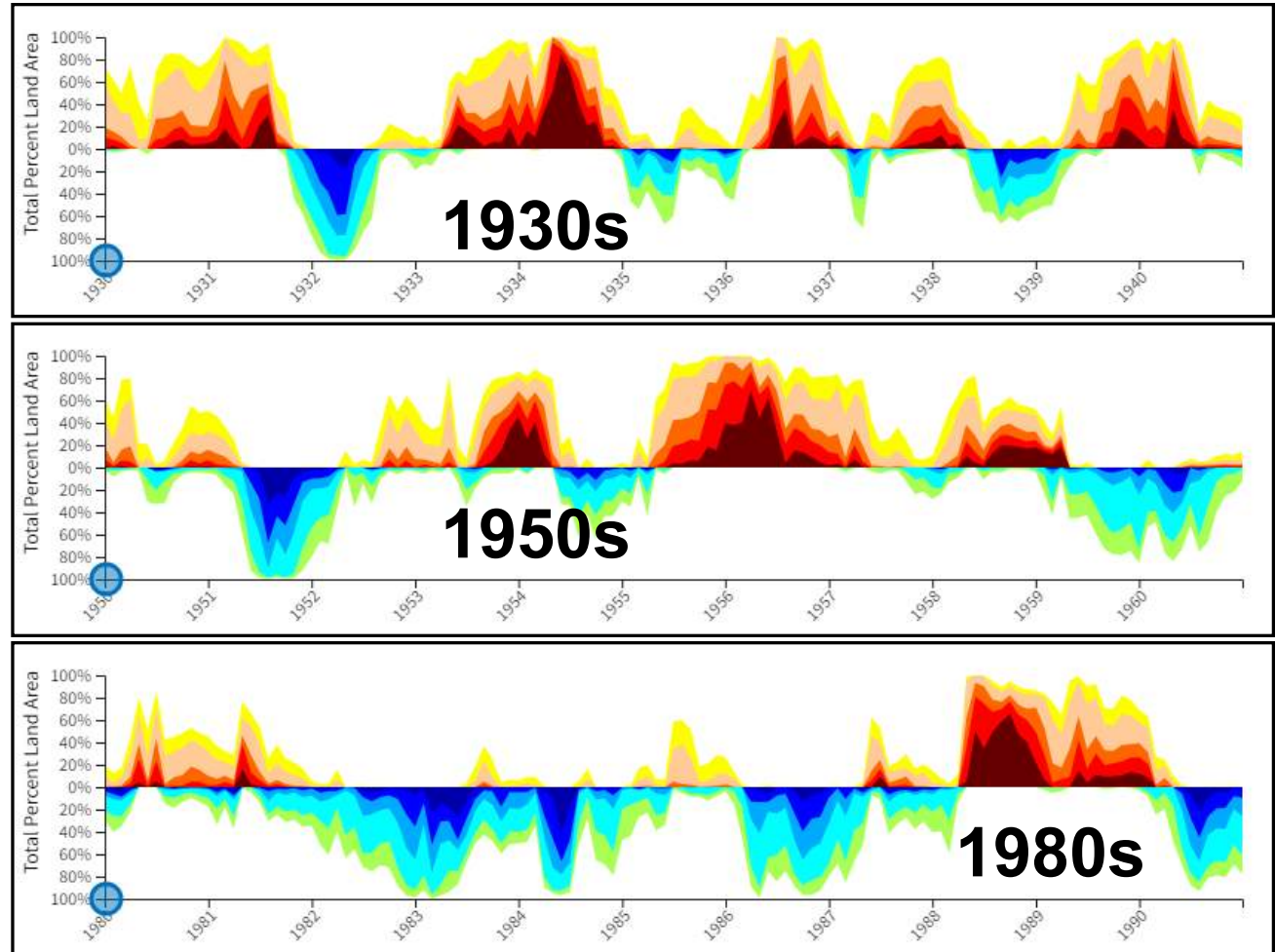
- Key Timeline Targets:
  - Draft EIS to National Water Management Center – Fall 2024
  - Draft EIS for public review – Winter 2025
  - Design funding – Spring 2025
  - Begin Construction – 2028



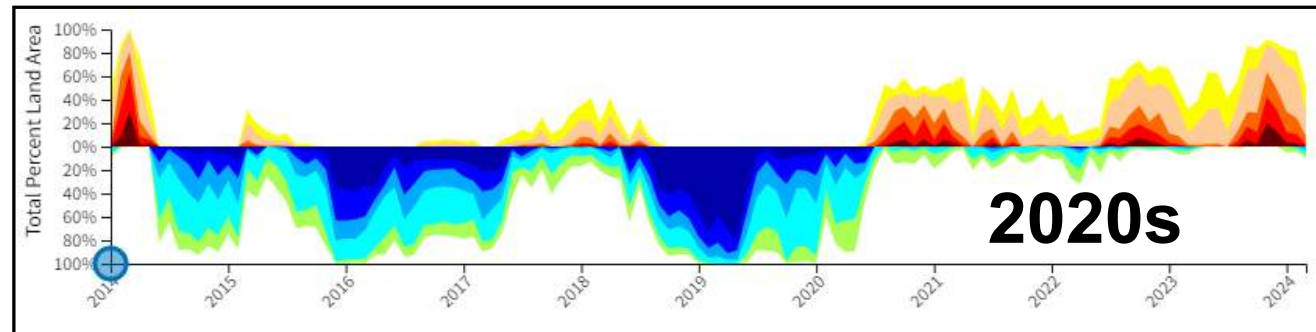
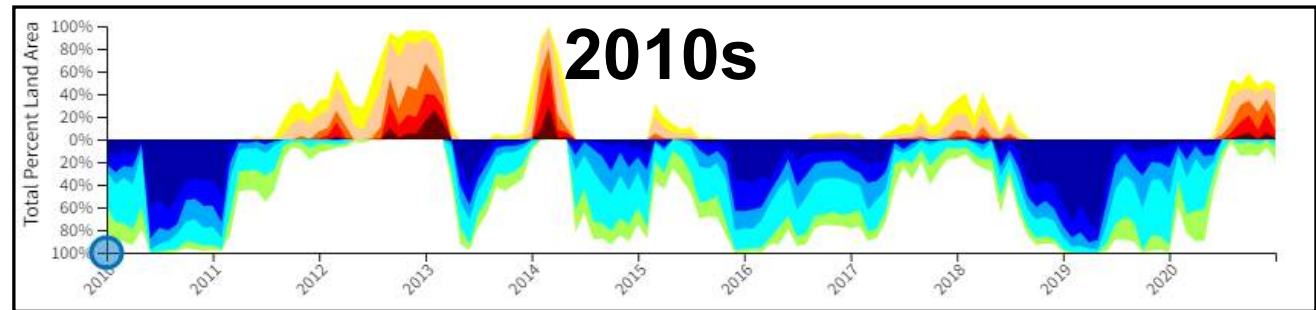
# **05 Drought Emergency**



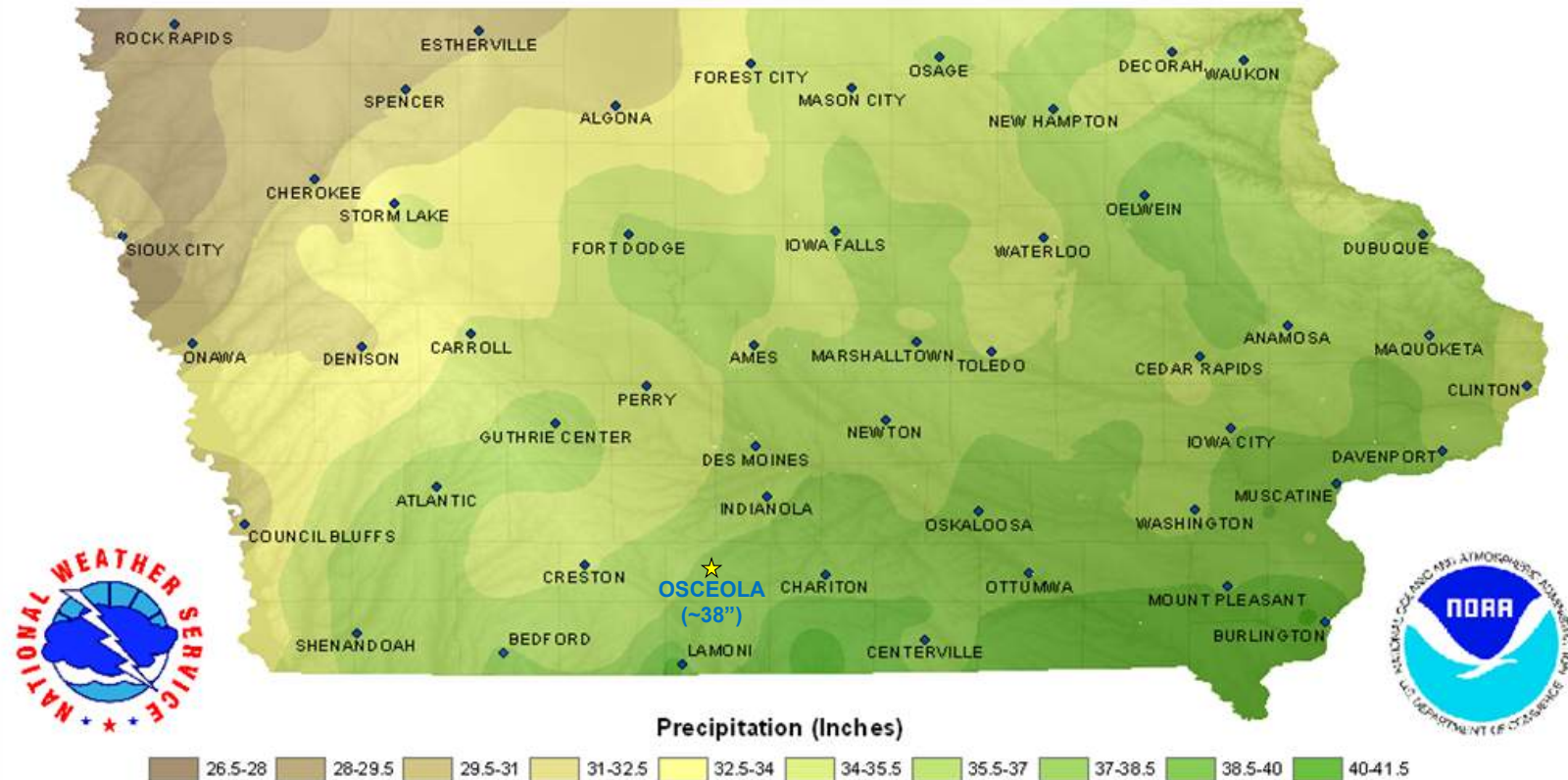
# Historic Droughts in Iowa



# Historic Droughts in Iowa

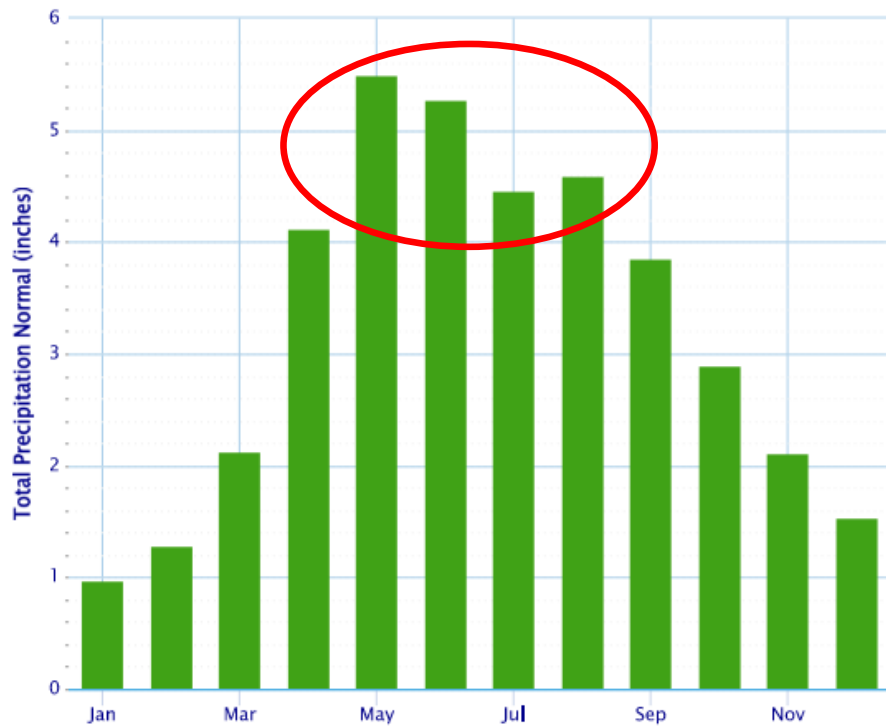


# Annual Precipitation Normals (1981-2010)



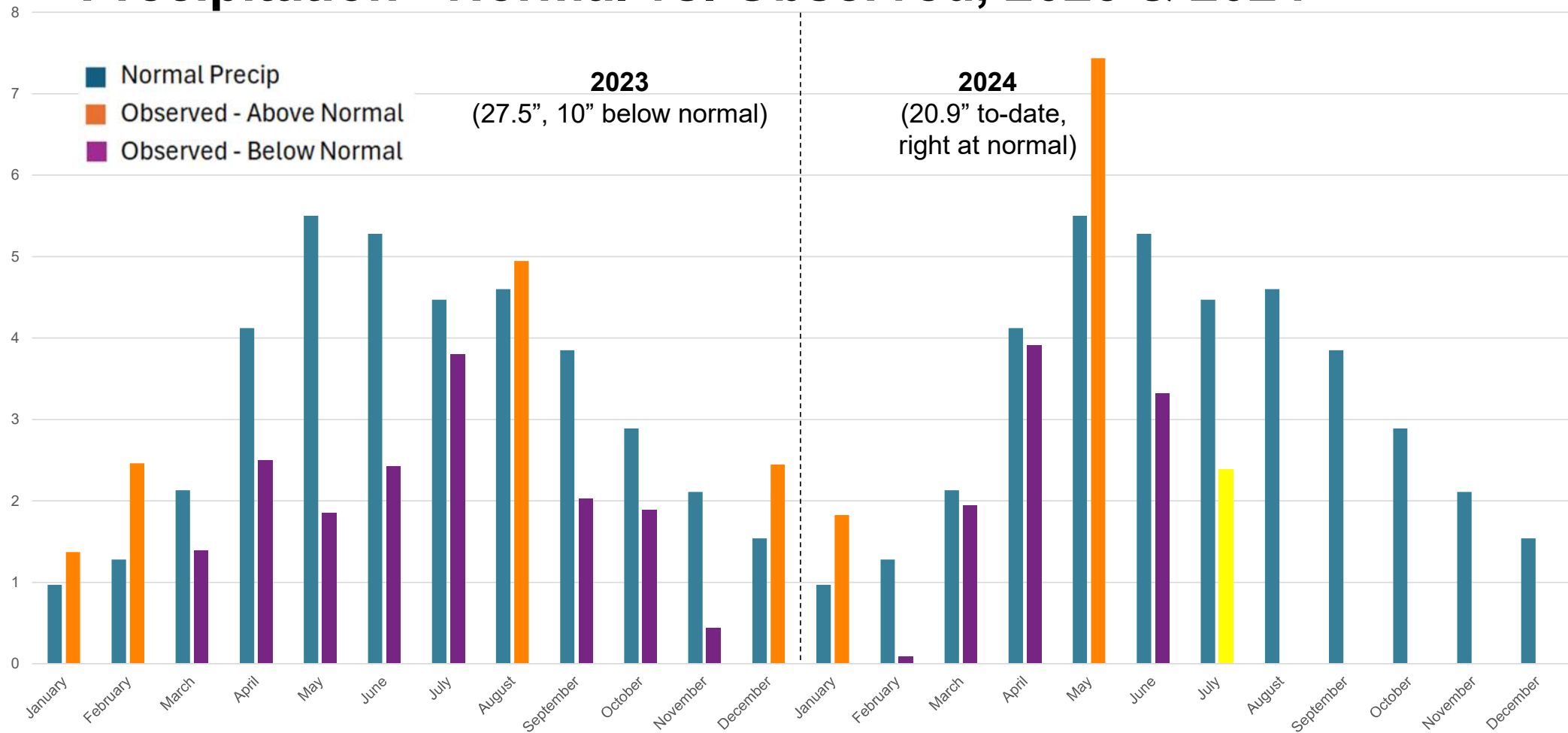
City	Precip	City	Precip	City	Precip	City	Precip	City	Precip	City	Precip	City	Precip	City	Precip	City	Precip	City	Precip
Algona	32.19	Burlington	38.48	Cherokee	30.72	Decorah	34.68	Forest City	34.00	Iowa Falls	36.68	Mt. Pleasant	38.39	Onawa	30.53	Rock Rapids	28.59	Toledo	35.24
Ames	35.83	Carroll	34.31	Clinton	34.59	Denison	32.26	Ft. Dodge	35.63	Lamoni	41.03	Muscatine	38.53	Osage	35.92	Shenandoah	36.34	Washington	36.49
Anamosa	37.84	Cedar Rapids	34.61	Council Bluffs/Omaha	30.62	Des Moines	36.01	Guthrie Center	36.78	Maquoketa	36.05	New Hampton	37.30	Oskaloosa	38.22	Sioux City	27.74	Waterloo	34.56
Atlantic	36.89	Centerville	37.47	Creston	35.48	Dubuque	36.25	Indianola	36.27	Marshalltown	37.35	Newton	35.52	Ottumwa	37.07	Spencer	29.51	Waukon	36.02
Bedford	37.23	Chariton	37.51	Davenport	36.03	Estherville	30.71	Iowa City	37.59	Mason City	35.20	Oelwein	37.72	Perry	34.23	Storm Lake	34.67		

# Monthly Precipitation (1991-2020)



Month	Total Precipitation Normal (inches)
January	0.97
February	1.28
March	2.13
April	4.12
May	5.50
June	5.28
July	4.47
August	4.60
September	3.85
October	2.89
November	2.11
December	1.54
Annual	38.74

# Precipitation - Normal vs. Observed, 2023 & 2024





## WEST LAKE LEVEL TRACKER\*

LATEST READING: 1070.98 ft. above MSL (06/26/24)



2024

### West Lake Pool Level-to-Cumulative Days of Water Supply

Pool Elevation:	Days (Estimated):
1072'	569 .... Normal Pool
1071'	526
1070'	485
1069'	445
1068'	406
1067'	368
1066'	331
1065'	291
1064'	253
1063'	216
1062'	180
1061'	146
1060'	114
1059'	83
1058'	53
1057'	26
1056'	0 ..... Raised Bottom Intake Level (11/20/23)
1055'	0
1054'	0
1053'	0
1052'	0 ..... Original Bottom Intake Level

This chart is an estimated reference and does not include future rain / snow projections. This chart is subject to change as pumpage per day changes. To breach the spillway water levels will need to exceed 1072.79

## 2023 Drought Emergency

- September 2022 – Section 1 Water Watch
- August 2023 – Section 2 Water Warning
- October 2023 – Section 3 Water Emergency
- November 2023 – Reconfigured lower intake
- April 2024 – 3-Stage Plan Approved
  - Short-Term: Water from Quarry
  - Intermediate-Term: SIRWA Interconnections
  - Long-Term: Clarke County Reservoir
- June 2024 – Water restrictions lifted by OWW Board

[11.9.23-Water-Conservation-Ordinance-top-004.pdf \(osceolawaterworks.com\)](https://osceolawaterworks.com/11.9.23-Water-Conservation-Ordinance-top-004.pdf)

Source: <https://osceolawaterworks.com>

# 06 NRCS WFPO Program

# **Natural Resource Conservation Service Funding**

## **Watershed and Flood Prevention Operations (WFPO)**

- Technical and financial assistance to states and local governments for planning and implementing watershed plans
- Watersheds up to 250,000 acres
- Agricultural benefits must be at least 20 percent of the total project benefits

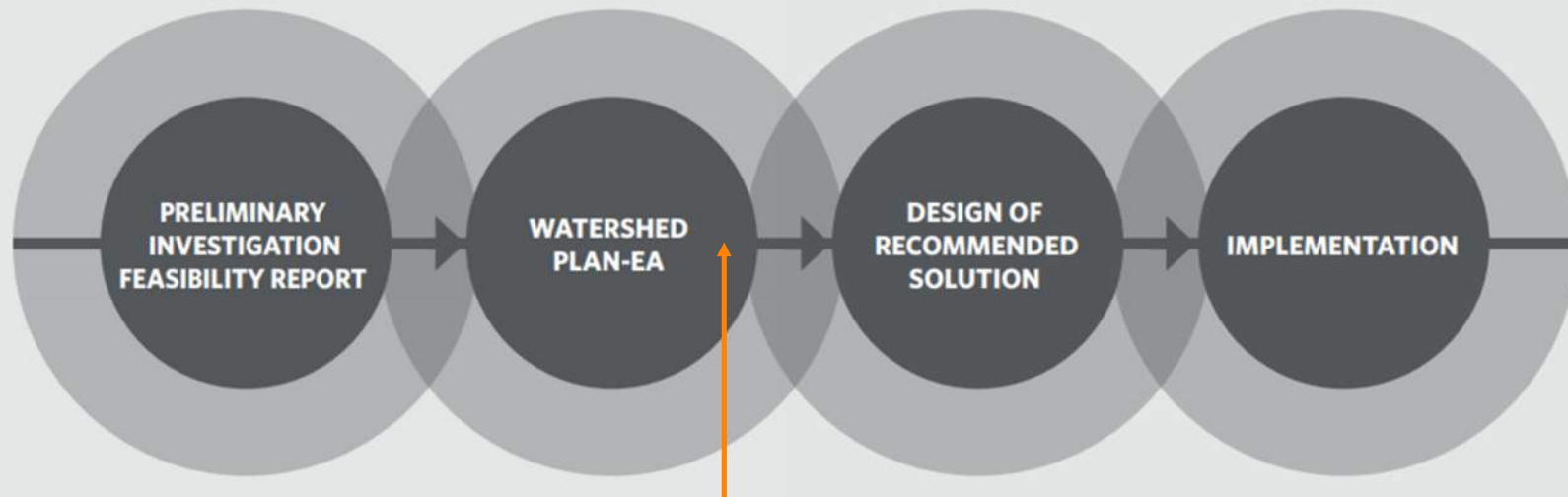
# NRCS WFPO Program – Cost Sharing

WFPO Cost Sharing by Project Purpose			
Project Purposes	Construction Cost Sharing	Engineering Technical Assistance	Property Rights
Flood Prevention	100%	100%	0%
Watershed Protection	Variable	100%	0%
Public Recreation	50%	100%	50%
Public Fish and Wildlife	50%	100%	50%
Agricultural Water Management	75%	100%	0%
Municipal and Industrial Water Supply	50%	0%	0%
Water Quality Management	TBD	100%	0%

Source: [https://www.nrcs.usda.gov/sites/default/files/2022-10/WFPO\\_Federal\\_Cost-Sharing.pdf](https://www.nrcs.usda.gov/sites/default/files/2022-10/WFPO_Federal_Cost-Sharing.pdf)

Title 390—National Watershed Program Manual, Figure 500-E2

# NRCS WFPO Program Implementation Process



1. Letter Request (Sponsor)
2. Preliminary Investigation Feasibility Report (Sponsor or NRCS)
3. Request for funding made by NRCS
4. Funding determination made

5. NRCS coordinates with Sponsor on implementation of development of the Watershed Plan-Environmental Document
6. Pending Recommended Plan, NRCS requests funding for design
7. NRCS requests funding for Construction



# Plan-EIS Key Elements

- Purpose & Need
- Affected Environment
- Alternatives
- Environmental Consequences
  - Wetland delineations
  - Biological assessment
  - Mitigation plans
  - Economics
- Provisions of the Preferred Alternative



# Questions?

Thank you!

**Michael Butterfield, PE**  
*Vice President | Project Manager*

**HDR**

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