Reservoir Releases, Downstream Water Quality, and Fisheries at Mark Twain Lake/Cannon Dam

USACE St. Louis District

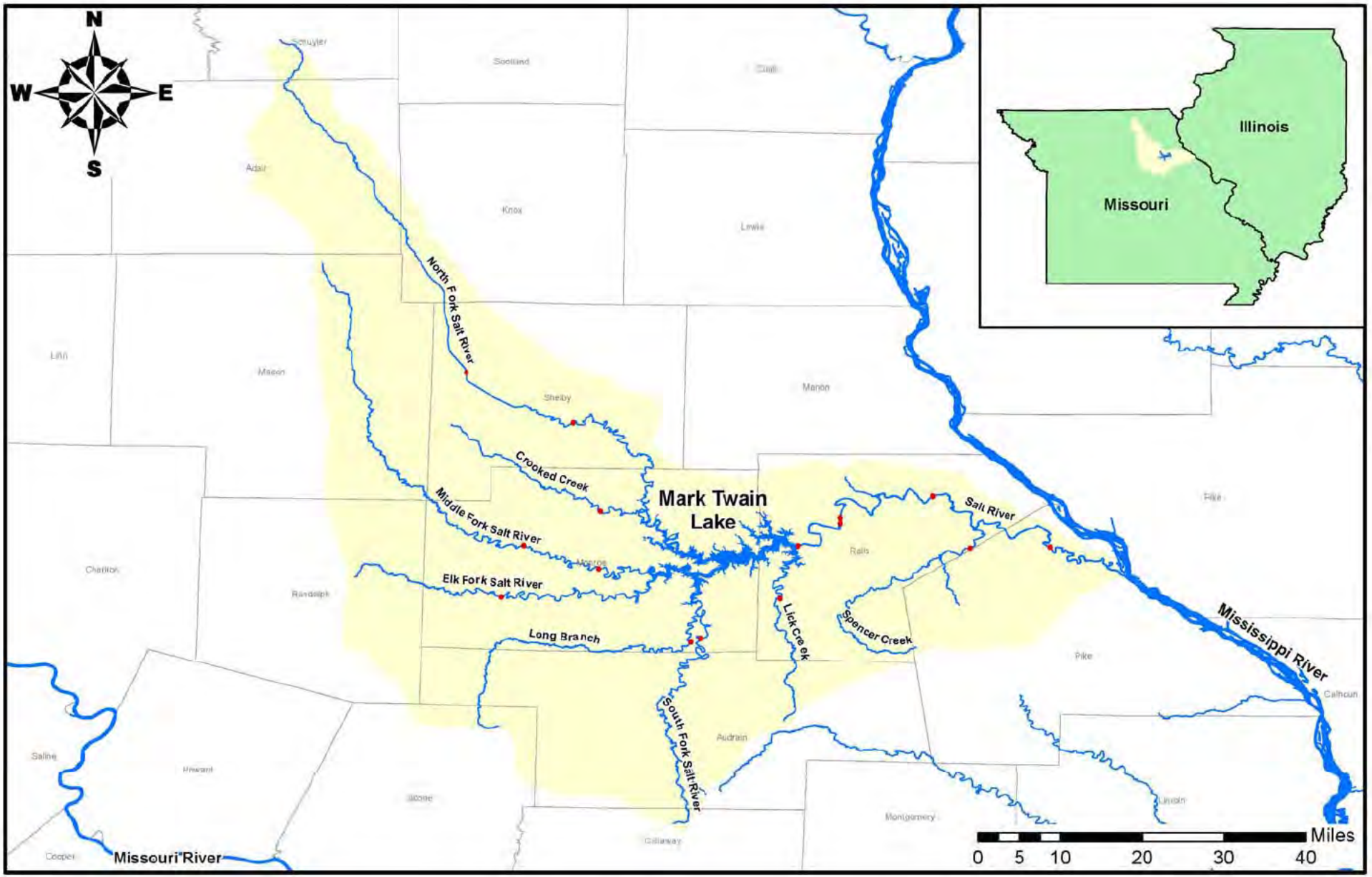
18 June 2015

US Army Corps of Engineers
BUILDING STRONG®

Project Purposes

- 54,000 Acre Project with Multiple Project Purposes:
  - ►Hydropower
  - ►Recreation
  - ►Fish and Wildlife
  - ►Water Supply
  - ►Incidental Navigation
  - ►Flood Risk Management

Salt River Watershed



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St. Louis District

Mark Twain Lake

Location Map

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9,100 4,550 0 9,100
Feet

5/12/2010

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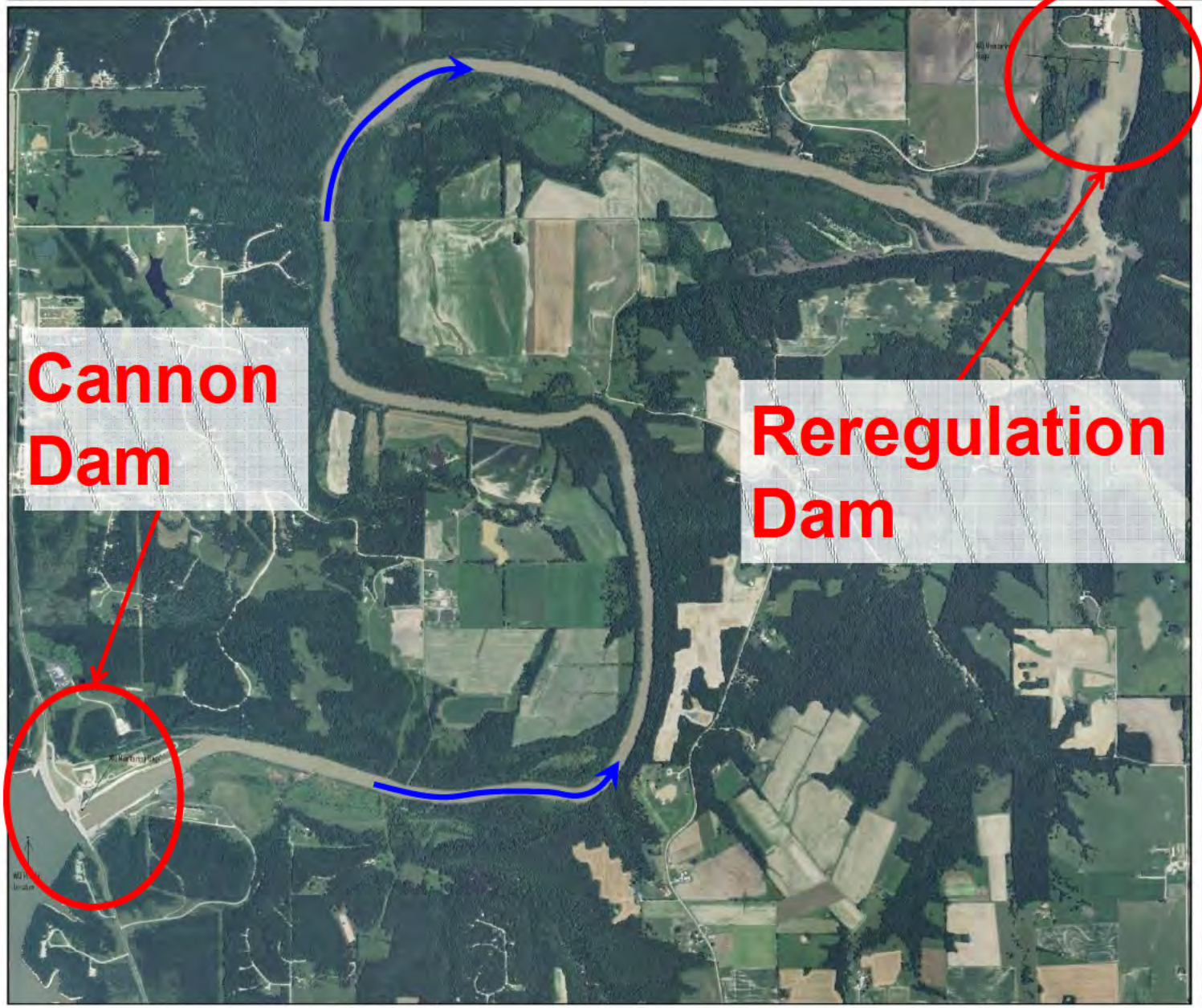
Salt River Re-Reg Pool



Location Map

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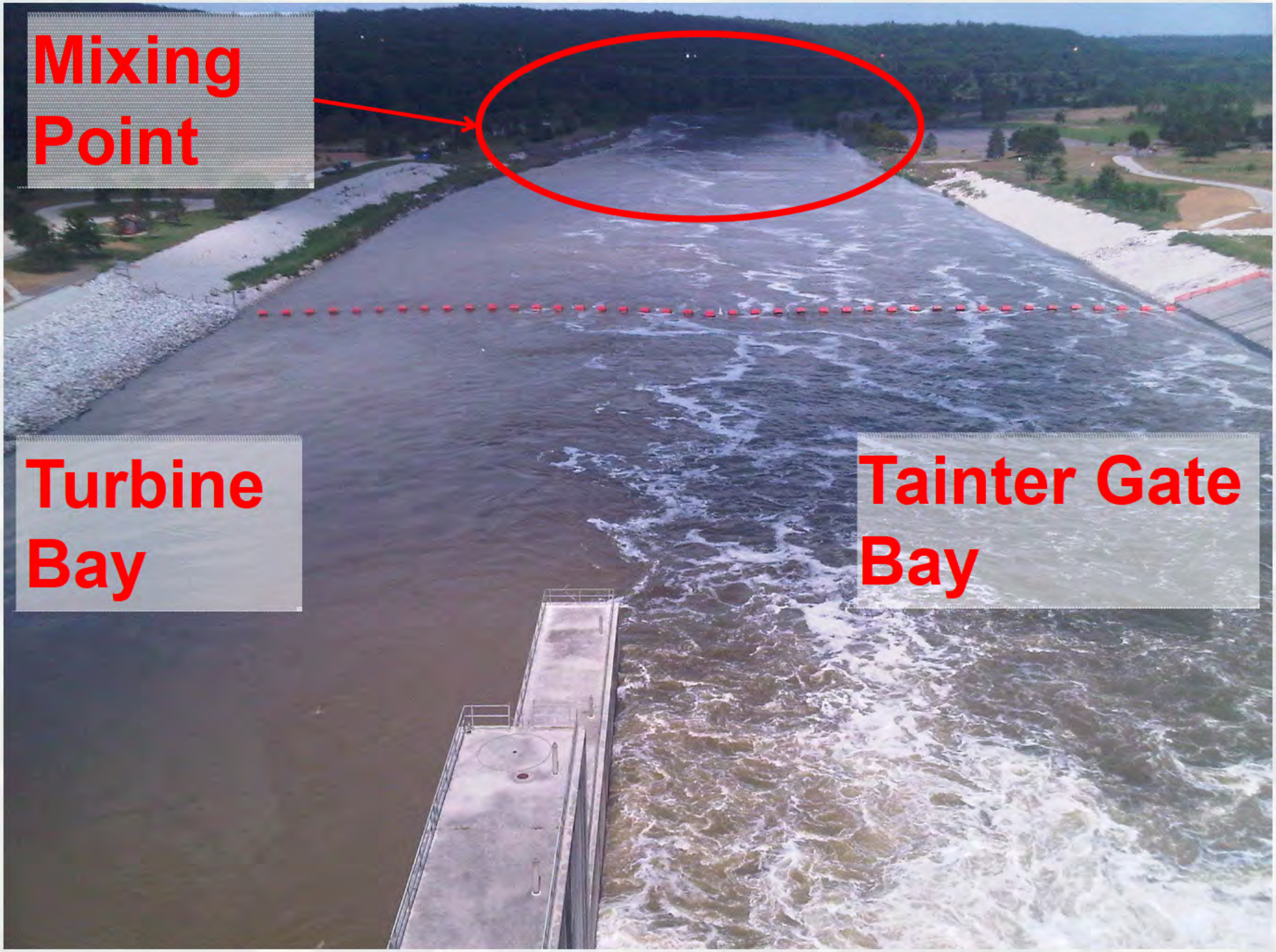
1,900 950 0 1,900
Feet

5/12/2010

Cannon Dam TW WQ Monitoring

2015 Reregulation Dam WQ Monitoring


Mixing Point
Turbine Bay
Tainter Gate Bay

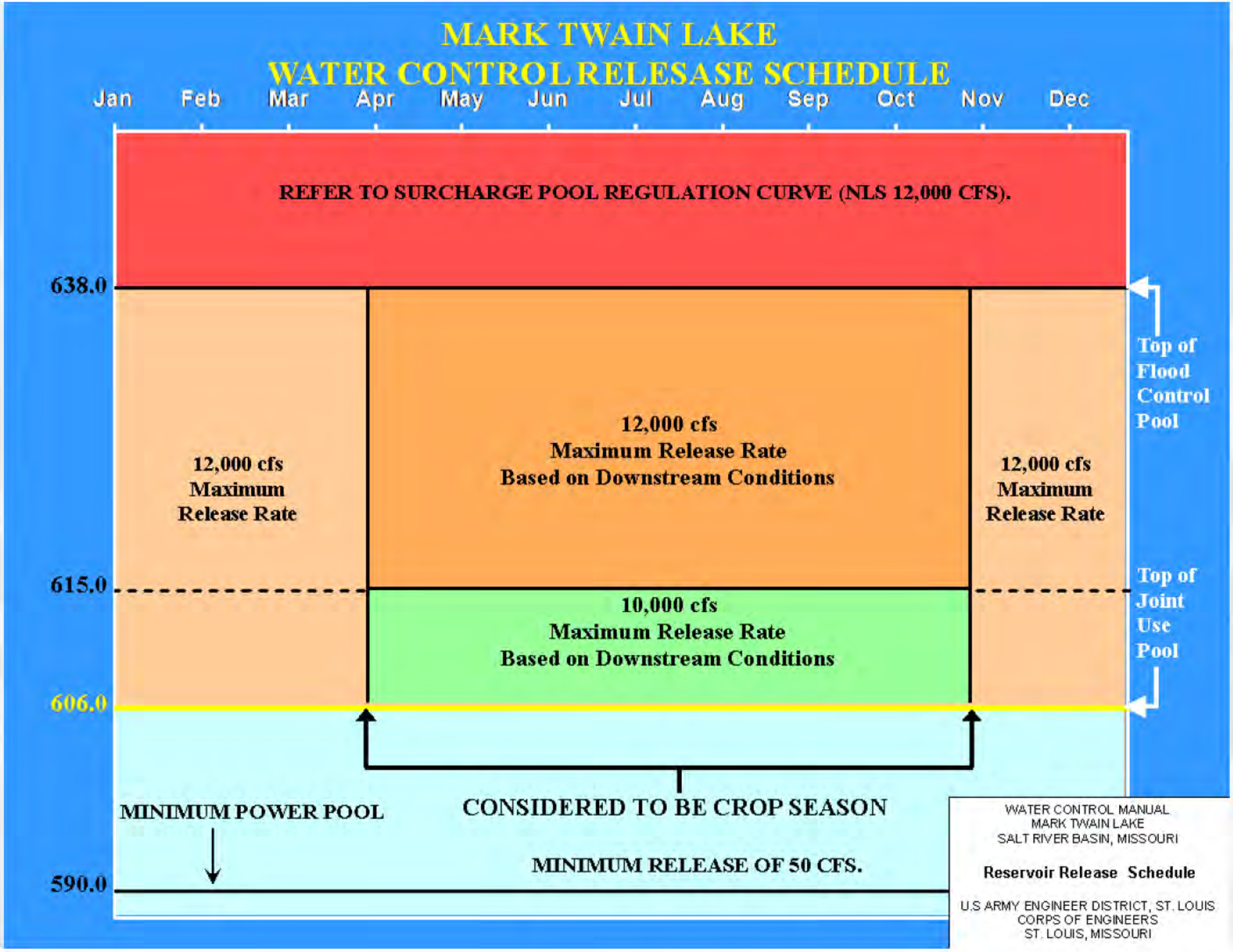
Overview

- Dissolved Oxygen Issues Apparent 2010
  - Installed DO gauge just above the re-reg dam 2010
- Water Control Plan – MVD approval Feb 2011
  - Feedback Meetings: 28 public meetings, SWPA, MO DNR and MO Dept of Conservation
- Yearly Data Evaluated for Dissolved Oxygen
  - Pool Elevations
  - Gauge Monitoring (Cannon TW and Rereg Dam)
  - Releases Necessary? (Turbine and Spill)
  - Water Quality Profiles

Water Quality

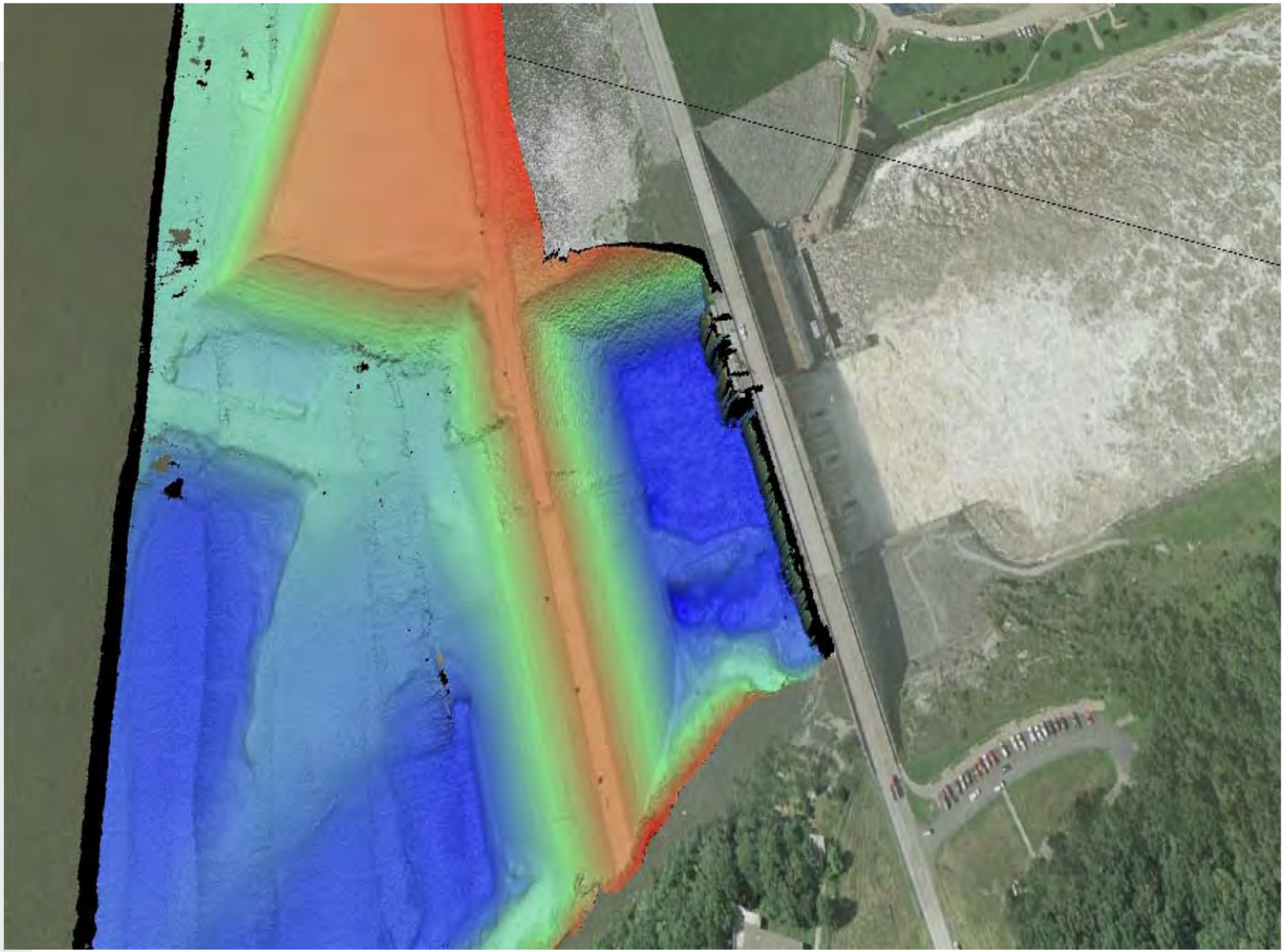
a. Objective. The objective is to ensure that the quality of water released from the Reregulation Pool meets the State of Missouri standards under 10 CSR 20 -7.031 (4)(J) Dissolved Oxygen. This regulation states that waters of the state of Missouri must maintain a level of 5 mg/L dissolved oxygen.

b. Regulation Procedure. In coordination between the Water Quality Office and the Water Control Office, tainter gate releases from Mark Twain Lake may be required in order to improve downstream water quality conditions. These decisions will be based upon dissolved oxygen data collection real-time within the Reregulation Pool, located at the Reregulation Pool stream gage. If the dissolved oxygen levels drop below the 5 mg/L criteria based on 10 CSR 20-7.031, subsection (4) part J Dissolved Oxygen, the preferred method of releases into the Reregulation Pool would be discharging water through the tainter gates.


MARK TWAIN LAKE
WATER CONTROL RELESASE SCHEDULE
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
REFER TO SURCHARGE POOL REGULATION CURVE (NLS 12,000 CFS).
638.0
615.0
606.0
590.0
12,000 cfs
Maximum
Release Rate
12,000 cfs
Maximum Release Rate
Based on Downstream Conditions
12,000 cfs
Maximum
Release Rate
10,000 cfs
Maximum Release Rate
Based on Downstream Conditions
Top of
Flood
Control
Pool
Top of
Joint
Use
Pool
MINIMUM POWER POOL
CONSIDERED TO BE CROP SEASON
MINIMUM RELEASE OF 50 CFS.
WATER CONTROL MANUAL
MARK TWAIN LAKE
SALT RIVER BASIN, MISSOURI
Reservoir Release Schedule
U.S ARMY ENGINEER DISTRICT, ST. LOUIS
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Water Control Plan

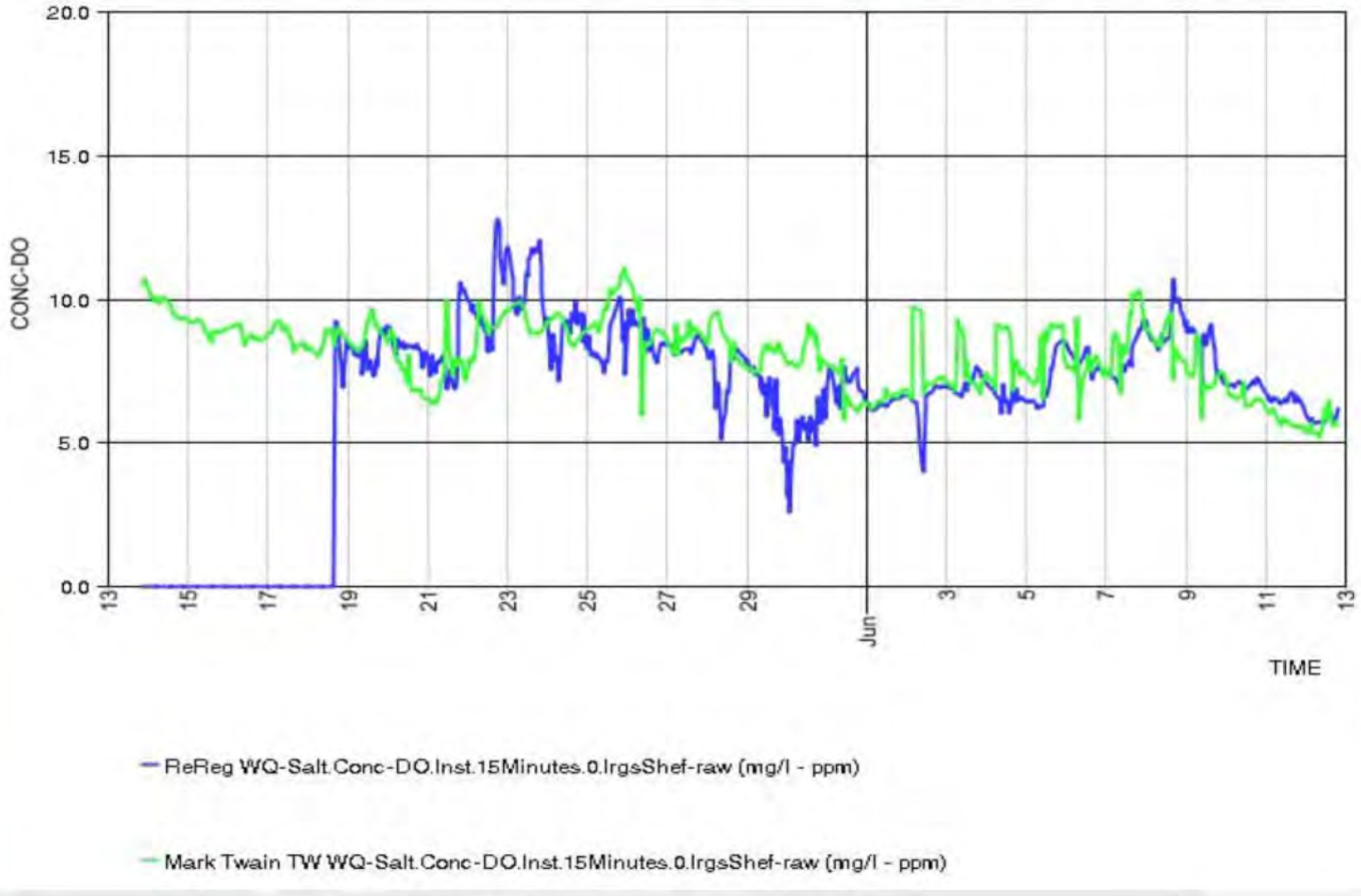
- Fish Spawn:
  - Enhance fish and wildlife to as great an extent as possible without conflicting with the achievement of other project purposes.
    - The pool elevation of Mark Twain Lake will be regulated from **April 23rd to June 15th** whenever possible so as to minimize the amount of fluctuation during spawn. This effort is in coordination with SWPA, COE and Missouri Department of Conservation. The Chief of Water Control Operations, taking into account all project purposes, hydrologic conditions and weather forecasts may attempt to moderate pool fluctuations during critical fish spawn when the **pool elevation is 610.0 feet NGVD or below** coordinated with Missouri Department of Conservation and Mark Twain Lake personnel.



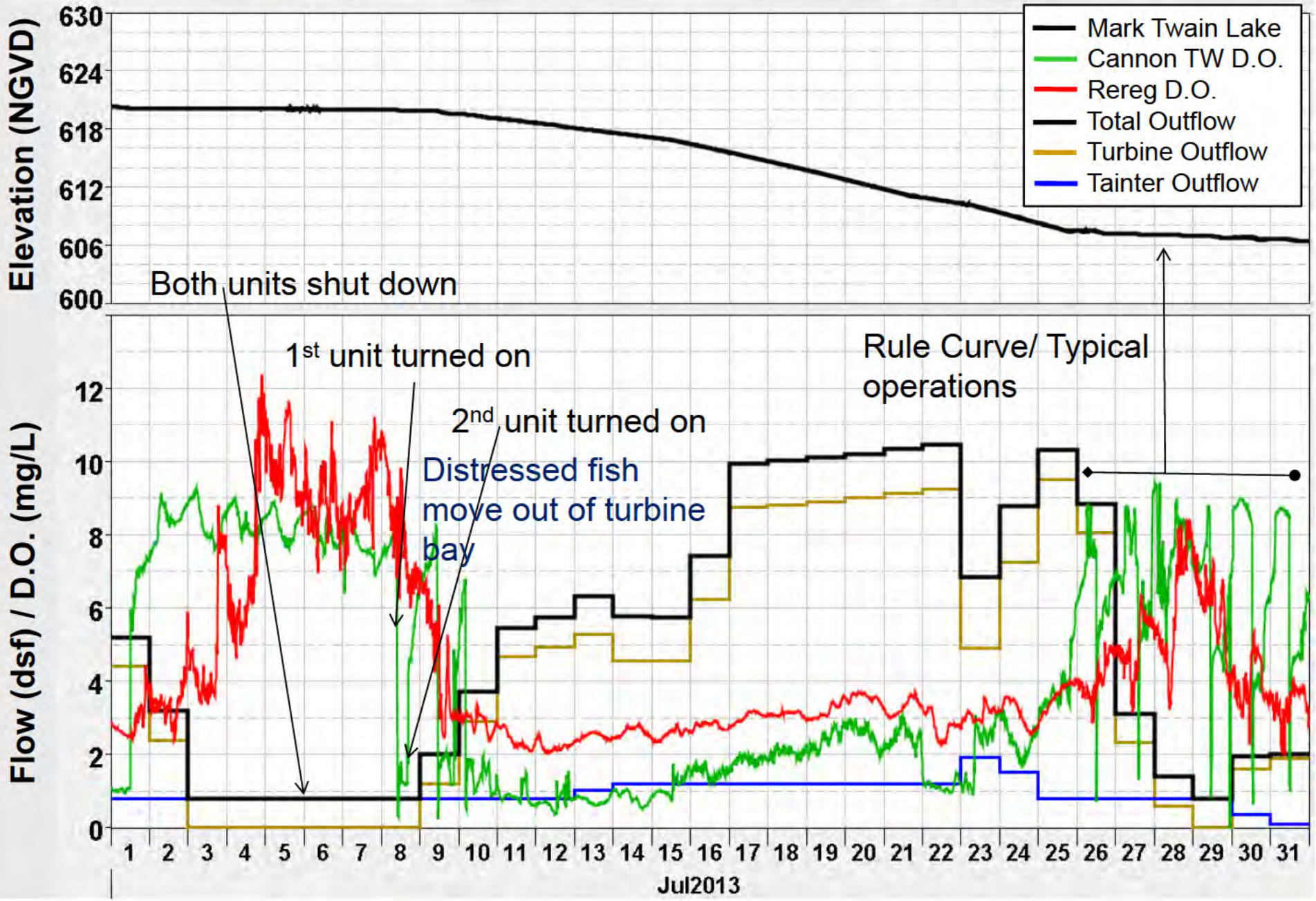
MARK TWAIN LAKE and CANNON DAM OPERATIONAL ACTION PLAN FOR 2015 POTENTIAL LOW DISSOLVED OXYGEN SEASON

Purpose of Plan: Provide the framework and criteria for interagency cooperation and actions which may help protect aquatic life downstream from Clarence Cannon Dam from low dissolved oxygen (D.O.) impacts to the extent reasonably possible while preserving the flood control and hydropower benefits of the project to the maximum extent possible. The cooperation and actions will be accomplished through modifications to routine operations at the dam. A D.O. working group was formed by the agencies involved to address this action plan and to develop investigations and implementation as funding allows of a long-term solution(s) to low D.O. concentrations.

June 2015 Tailwater/Re-reg Gauge



Example With Tainter Gates for DO



Questions ?