

OROVILLE DAM CITIZENS ADVISORY COMMISSION

Hosted by the California Natural Resources Agency



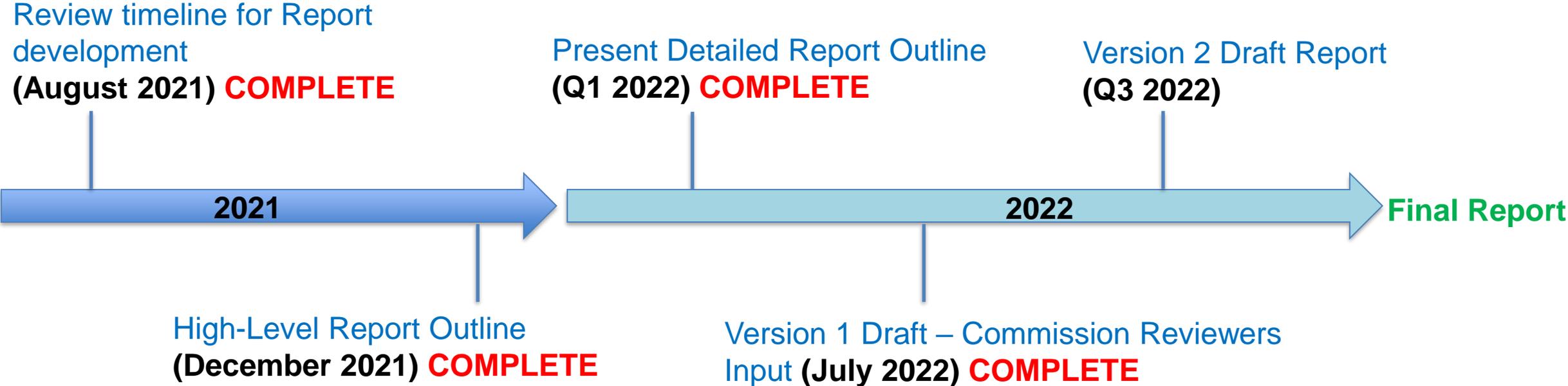
ROLL CALL

- Commissioner Bateman
- Lieutenant Collins
- Supervisor Connelly
- Supervisor Conant
- Secretary Crowfoot
- Chief Deputy Director Curry
- Supervisor Flores
- Supervisor Fuhrer
- Assemblyman Gallagher
- Supervisor Kimmelshue
- Deputy Licon
- Captain Million
- Director Nemeth
- Senator Nielsen
- Councilmember Pittman
- Mayor Reynolds
- Lieutenant Stokes
- Superintendent Teague
- Supervisor Vasquez

ITEM 1
WELCOME AND INTRODUCTIONS

ITEM 2
COMMISSION REPORT UPDATE

Commission Report Development Timeline



Commission Report Process

Commission Reviewers

- Supervisor Bill Connelly
- Lt. Stephen Collins
- Senator Nielsen's Office (Rob Olmstead)

Process

- Reviewed and approved outline
- Reviewed and approved detailed outline
- Reviewed and approved content and approach
- Reviewed and approved draft report version 1

Projects Timeline
[Insert timeline graphic of major capital projects at facility and status] **DRAFT**

Three-Year Accomplishments

This report was prepared using sources from the Commission including meeting summaries, transcripts, and presentations. It summarizes most of the topics that commissioners received reports and updates on between September 2019 and July 2022. The exceptions are a briefing commissioners received on Department of Water Resources (DWR) communications during Meeting 3 and a presentation by a representative from the State Water Contractors during Meeting 8. Two site visits also are not summarized here. DWR hosted a public tour of the Oroville facility prior to the Commission's second meeting on November 20, 2019, and commissioners participated in a tour of the joint State-Federal Flood Operations Center in Sacramento on November 1, 2021.

The report is divided into the four overarching areas, as required by SB 955:

1. An overview of ongoing maintenance and improvements made at the dam and its site.
2. A register of communications received from the department and other parties to the Commission.
3. Notice of upcoming plans made by the department for the dam and its site.
4. An overview of flood management projects on the Feather River affecting public safety and flood risk reduction.

Additional detail and information on every topic covered can also be found in each meeting's presentation materials, summary and transcript. These reference materials are available online on the Commission webpage at <https://resources.ca.gov/initiatives/Oroville-Dam-Citizens-Advisory-Commission>



Tour of the joint State-Federal Flood Operations Center

DRAFT

1. An overview of ongoing maintenance and improvements made at the dam and its site

With the Commission's focus on ensuring that the public has information about the safety and condition of the Oroville Dam and its facilities, many presentations to the Commission addressed maintenance and improvements. Presentations also focused on a variety of related topics including wildfire preparedness, recreation facilities, maintenance and funding, and regulatory oversight.

Fire Response and Prevention: Meetings 5 and 6

Wildfire risk is high in the region surrounding the Oroville Dam. Annual treatment and maintenance help mitigate the risk to dam facilities. The Commission received updates on fire-related activities during meetings 5 and 6.

Meeting 5, November 13, 2020

Ms. Curry and Mr. Marshall presented an overview of the fire season and mitigation efforts. As of Meeting 5, the 2020 fire season had burned 4 million acres across California. In the Oroville region, the September 2020 North Complex Fire burned 320.00 acres in and around Butte County, destroying 1,523 single family homes and 51 commercial properties. Curry and Marshall emphasized the mutual aid system in their presentation. They covered the ways Cal OES and Butte County Sheriff's Office coordinate search and rescue, oversight of hazardous materials, and debris removal in advance of the rainy season.

Mr. Teague reported impacts to the recreation area from the August 2020 Potts Fire and the North Complex Fire. Debris collection and monitoring are done via vessels docked on the lake, per Mr. Craddock.

Commission Report Structure

Introduction

➤ **Commission Background**

- February 2017 spillway incident
- SB 955 legislation (Nielsen/Gallagher)
- Forum for input and information [non-regulatory body]

➤ **Commission Purpose**

- Serve as a representative to the public for the purposes of providing public input and receiving information from the dam operator.
- Act as a unified voice from the communities surrounding Oroville Dam to provide public feedback, advice, and best practices to the dam operator.
- Publish a report at least once every three years.

➤ **Report and Content Mandated by SB 955**

- “Publish a report at least once every three years”

Commission Report Structure

Forward

- Overview of public meetings
- Overview of presentation topics
- Commission actions to-date

Content

1. An overview of ongoing maintenance and improvements made at the dam and its site.
2. A register of communications received from the department and other parties to the Commission.
3. Notice of upcoming plans made by the department for the dam and its site.
4. An overview of flood management projects on the Feather River affecting public safety and flood risk reduction.

Commission Report Structure

Conclusion

- Accomplishments to-date
 - Multiple public meetings each year
 - Dam facility visit
 - Commissioner Joint Flood Operations Center Tour/Briefing
 - Sponsored Flood Safety Stakeholder Technical Workshop
 - Dam owner briefings requested by the Commission regarding operations, maintenance, and public safety topics
- Forward-looking

Appendix

- Register of communications from State agencies and other parties.

ITEM 3
FLOOD SAFETY STAKEHOLDER TECHNICAL
WORKSHOP RECAP

Recap of Flood Management Stakeholder Workshop: April 22, 2022

Oroville Citizen Advisory Commission
July 29, 2022



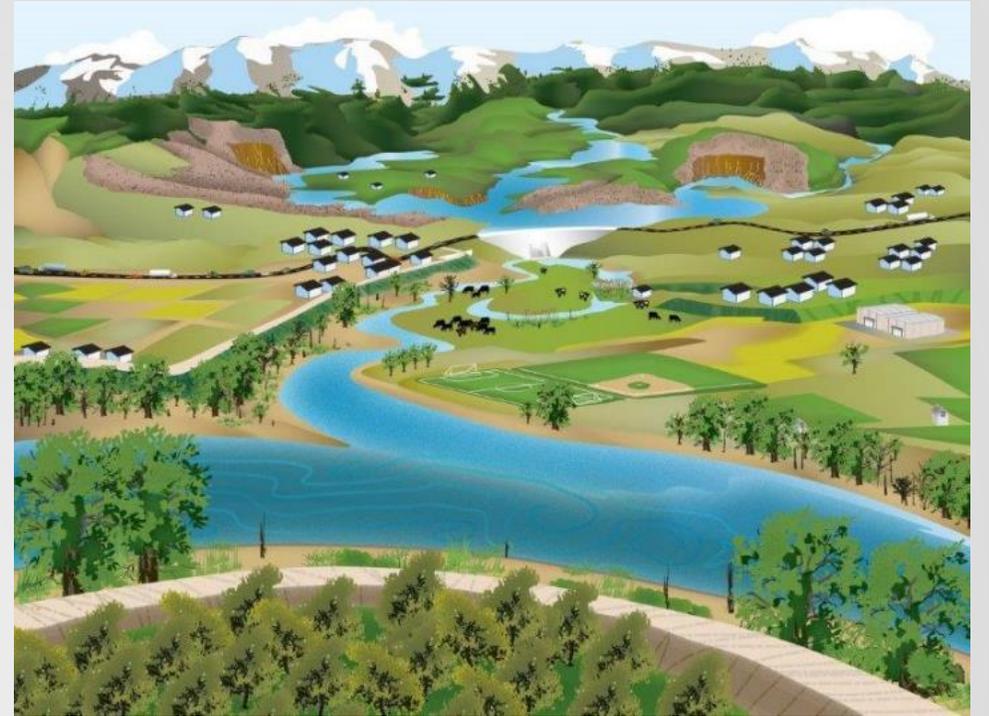
Image: Screenshot from DWR's designated floodway inspection tool focused on Feather River.



Workshop Purpose

Purpose:

To provide an interactive forum where stakeholders can better understand the coordination between the key Federal and State entities responsible for flood management in the Feather River and speak to these experts about their interests and concerns related to flood safety and downstream communities.



Approach:

Each speaker was limited to 5 to 20 minutes, and asked to keep their segment short in order to allow for stakeholders to ask questions following each presentation.

The speakers were generally sequenced with the initial talks focused in the upper watershed and the final talks addressing how downstream communities can prepare for high water / flood conditions.



Workshop Speakers

Federal and State experts in flood risk management including:

- State Climatologist (DWR)
- Lead for USACE Reservoir Operations Sacramento District USACE
- FEMA Floodplain Mapping Engineer
- National Weather Service: Sacramento Office Service Coordination Hydrologist
- State Levee and Channel Inspection Lead (DWR)
- State-Federal Flood Operations Center Lead (DWR)
- UC Berkeley Center for Catastrophic Risk Management Expert
- California Office of Emergency Services Dam Safety Lead
- State Floodplain Manager (DWR)
- State Water Project Management (DWR)



FEMA

Berkeley
UNIVERSITY OF CALIFORNIA



Cal OES
GOVERNOR'S OFFICE
OF EMERGENCY SERVICES



CALIFORNIA DEPARTMENT OF
WATER RESOURCES

Key Themes from Workshop

- Discussions on the magnitudes and complexities associated with extreme precipitation events (including the role of Atmospheric Rivers in the Feather River watershed)
- Key parameters and considerations to design, operate and inspect flood defense systems (including dams, channels, and levees)
- Different types (and uses) of inundation maps (dams vs. floodplains) and how these are shared
- Roles and responsibilities in developing dam emergency action plans
- Value of emergency response exercises and preparing for extreme (unlikely) events
- Use forecasts and coordination between emergency response entities
- Coordination in preparing long-term investment plans to “buy down” risk

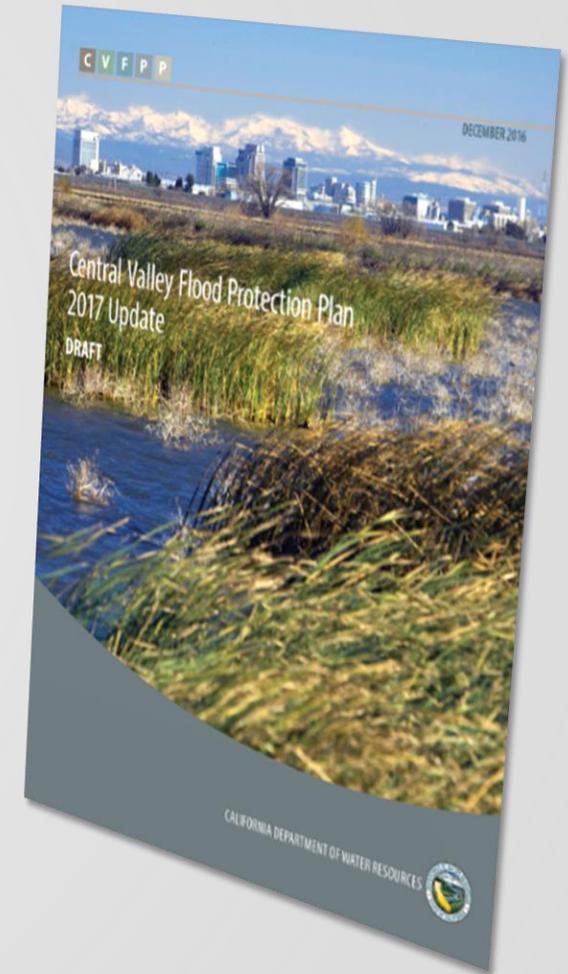


Image: Example of portfolio of action approach to buying down flood risk based on USACE concept.



Additional Venues for On-Going Flood Management Stakeholder & Community Engagement

- The Central Valley Flood Protection Plan (CVFPP) outlines the State's priorities for reducing flood risk
- The CVFPP is often discussed at the Monthly Central Valley Flood Protection Board meetings
[Central Valley Flood Protection Board – State of California](#)
- Annual preseason coordination meetings are also held between DWR, Cal OES, USACE, NWS and local emergency response and flood management entities



ITEM 4
OROVILLE DAM FACILITIES UPDATE

State Water Project Asset Management & Oroville Annual Maintenance & Projects

Oroville Citizens Advisory Commission Meeting
July 29, 2022



David Rennie, Manager
Asset Management
Division of Operations and Maintenance

Oroville Expenditures

Expense Type	Actual Expenditures				Planned Expenditures	
	CY2018	CY2019	CY2020	CY2021	CY2022	CY2023
Annual Operations & Maintenance (O&M)	\$42.7M	\$47.2M	\$46.2M	\$53.0M	\$47.3M	\$48.0M
Capital Projects	\$44.4M	\$50.9M	\$46.3M	\$45.3M	\$57.6M	\$57.1M
TOTAL	\$87.1M	\$98.1M	\$92.5M	\$98.2M	\$104.9M	\$105.1M

Note: Excludes costs for Oroville Spillways Emergency and Reconstruction



Annual O&M Field Division

Activities

Field Division Administration

- Business Services
(Warehouse Operations)
- Training & Development
- Program Management
- Service Contracts

Facilities Operations & Maintenance

- Preventative Maintenance
- Condition Assessment Program Inspections
- Dam Safety Surveillance
- Civil Maintenance
- Facilities Security
- Facilities Safety
- Plant Operations
- Visitors Center Operations
- Area Control Centers



Annual Operation & Maintenance Activities

HYATT POWERPLANT

- Unit Reliability Outage/CAP Inspection
- Unit Transformers Annual Maintenance
- Unit Annual Maintenance & Relay Testing
- Switchyard and Breaker Inspections
- Unit Runner Inspections and Repair
- Fire Systems Annual Inspection/Testing
- Station Service Annual Maintenance
- Battery/Charger Testing

THERMALITO POWERPLANT

- Unit Reliability Outage/CAP Inspection
- Unit Transformer Annual Maintenance
- Station Service Transformer Annual Maintenance
- Fire Systems Annual Inspection/Testing
- Unit Breaker Maintenance
- Bypass Gate Reliability Inspection
- Battery/Charger Testing

THERMALITO DIVERSION DAM POWERPLANT

- Unit Annual Outage/Inspection
- Radial Gate Full Open Testing
- Battery/Charger Testing

OROVILLE DAM/LAKE / THERMALITO FB/AB / OTHER LOCATIONS

- Flood Control Systems Annual Maintenance
- **DSOD/FERC Annual Inspections**
- Intake Shutter Annual Maintenance
- Fence Repair and Gate/Sign Maintenance
- Oroville Spillway Radial Gate Testing
- Roadway Maintenance
- Fish Hatchery Annual Maintenance
- Oroville Lake Debris Removal/Log Boom Maintenance
- **Dam Surveillance and Monitoring – DAILY**
- Water Flow and Temperature Monitoring – DAILY
- Water Quality Sampling
- Debris Removal/Erosion Repair – All Dams
- Vegetation Maintenance – All Dams
- Fuel Load Reduction

UPPER FEATHER RIVER DAMS/LAKES

- **DSOD Annual Inspections**
- Vegetation Maintenance – All Dams
- Debris Removal – All Dams
- Roadway Maintenance
- Debris Removal/Erosion Repair
- Precipitation Site Maintenance
- **Dam Surveillance and Monitoring**
- Two – Watermaster Areas
- Annual Snow Surveys



2022 Capital Improvement Projects

- Oroville RVOS Rehabilitation
- Oroville RVOS – Standby Contract
- Oroville Dam - Lakeside Access Rd
- Thermalito Afterbay Dam Well Replacement - Phase 2
- Hyatt Powerplant & Thermalito Powerplant Fire Detection System
- Oroville Field Division Physical Security Project - Phase 1
- Palermo Tunnel Bulkhead Improvements
- Furnish and Refurbish Feather River Fish Hatcher & Thermalito Diversion Dam Stoplogs
- 2022 Lake Oroville Survey
- Thermalito Diversion Dam Power Canal Spall Repair
- Bidwell Bar Bridge Seismic Retrofit - Phase 1
- Loafer Creek Launch Ramps
- FCO Hoist Refurbishment
- Hyatt Powerplant Units 2, 3, 5, & 6 Air Cooler Replacement
- Plant Maintenance Building HVAC Replacement
- Canyon Creek Bridge Seismic Retrofit – Phase 1
- FERC B105 – Fish Monitoring Station and Segmentation Weir Planning
- Recon Study Update for Feather River – Fish Habitat Temperature
- Hyatt Powerplant Units 3 & 5 Refurb Value Engineering Study
- Hyatt Powerplant Turbine Shutoff Valve Value Engineering Study - Phase 2
- Hyatt Powerplant and Thermalito Powerplant 230KV Circuit Breaker Retrofit
- Enterprise Bridge Seismic Retrofit - Phase 1
- Craig Access Road
- Hyatt Powerplant Penstock 1 & 2 Inspection and Repair
- Hyatt Powerplant Station Service 480VAC Breaker Replacement
- Hyatt Powerplant 230 KV High Pressure Fluid Filled Cable System Study
- Seal and Pave Roads
- Thermalito Afterbay River Outlet Radial Gate Refurbishment
- Oroville Dam Core Block and Grout Gallery Piezometer Installation
- Oroville Comprehensive Needs Assessment Early Implementation
 - Parish Camp Saddle Dam Raise
 - Palermo Canal Relining
- Oroville Dam BBCSDM Flood Fight Materials
- Oroville Dam Woody Debris Pilot Study
- Oroville Dam Seismic Stability Study
- Oroville Dam – Hyatt Powerplant Seismic Walkdown Phase II
- Oroville Dam Flood Control Outlet – Structural Re-analyses
- Oroville Dam Coreblock Gallery Drainhole Inspection and Cleaning
- Thermalito Diversion Dam Updated Stability Analysis

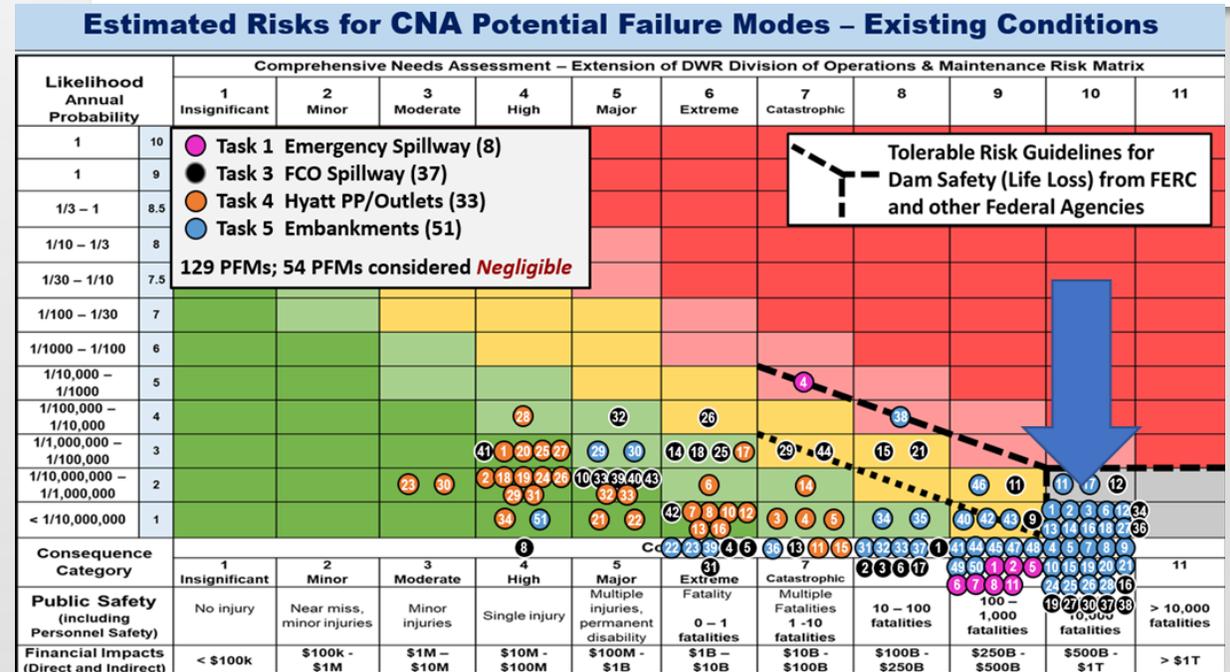
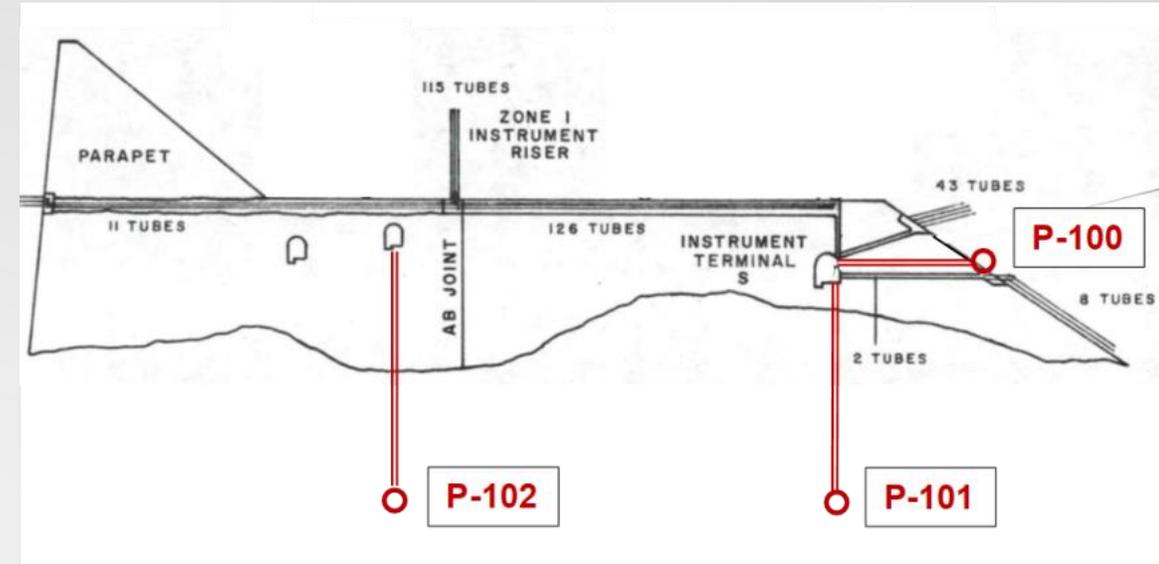


Oroville Dam Safety Project Updates

- Coreblock and Grout Gallery Piezometers (DWR - CNA)
- Parish Camp Saddle Dam Raise (DWR - CNA)
- Lake Oroville Bathymetry (DWR)
- Hyatt Powerplant Intake Structure Inspection (Part 12D)
- Palermo Canal Lining & Maintenance (DWR - CNA)
- Embankment Deformation Monitoring (DWR - CNA)
- Updated Seismic Stability/Deformation Analysis (Part 12D)
- Flood Control Outlet Projects (CNA & Part 12D)
- Emergency Spillway – Further Studies

Oroville Dam Coreblock and Grout Gallery Piezometers

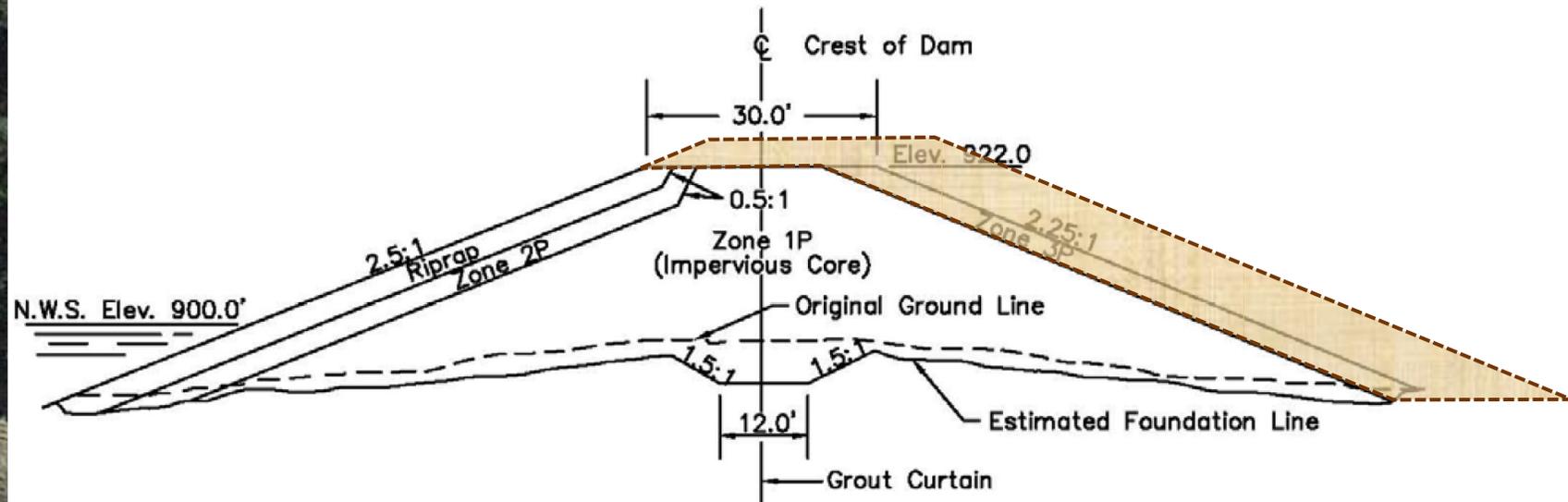
- Eight piezometers planned, as well as improvements to seepage weir instrumentation.
- Instrument locations prepared for specialized drill rig (Nov 2021 – January 2022).
- Installation planned for Fall 2022.



Parish Camp Saddle Dam Raise

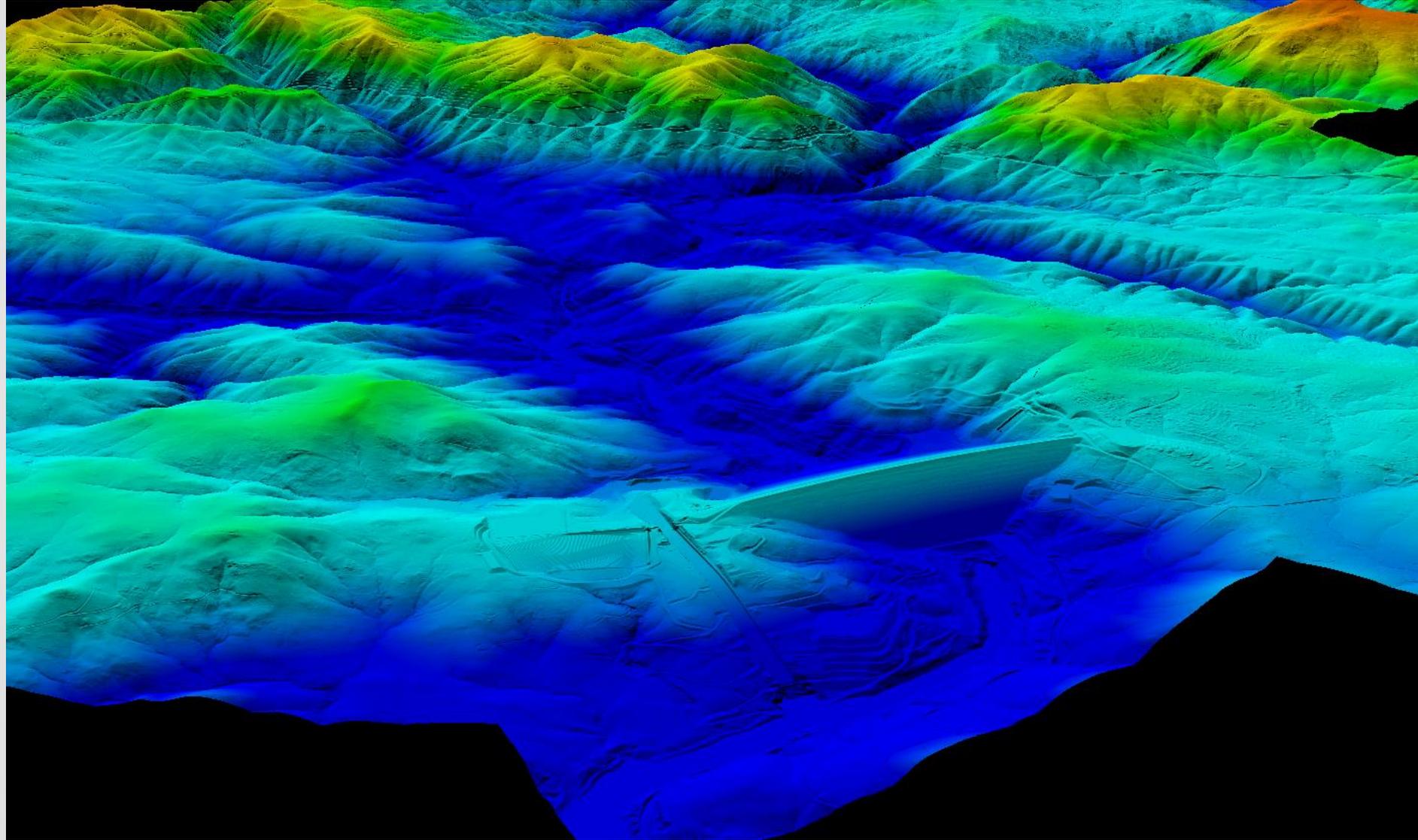
Raise Parish Camp Saddle Dam to reduce potential for overtopping during very extreme flood events.

- ✓ Geotechnical Exploration Plan submitted to FERC and DSOD; comments addressed.
- ✓ Fieldwork scheduled for Fall 2022 – Contingent on FERC & DSOD approval.
- ✓ Preliminary design and environmental reviews initiated.
- ✓ Initiate Construction – 2026



Lake Oroville Bathymetry

- Update Reservoir Capacity Curve
- Assess Sedimentation
- Provides a baseline for comparison in the future (burned watershed)



Hyatt Powerplant Intake Structure Inspection

- Rope access structural inspection of structure during historic low reservoir condition.
- Inspection of small diameter air vent via pipe crawler remotely operated vehicle.



Palermo Canal Lining Improvements

Improve canal lining to reduce leakage and potential for landslides/instability above the Hyatt Powerplant switchyard and other facilities.

- ✓ Condition assessment completed
- ✓ 95%-Level Drawings and Specifications completed in May 2022
 - ✓ New Liner for 130-foot unlined portion
 - ✓ Cleaning and maintenance of existing liner
- ✓ Construction planned for 2023 – Contingent on FERC approval.



Photo by Florence Low, DWR

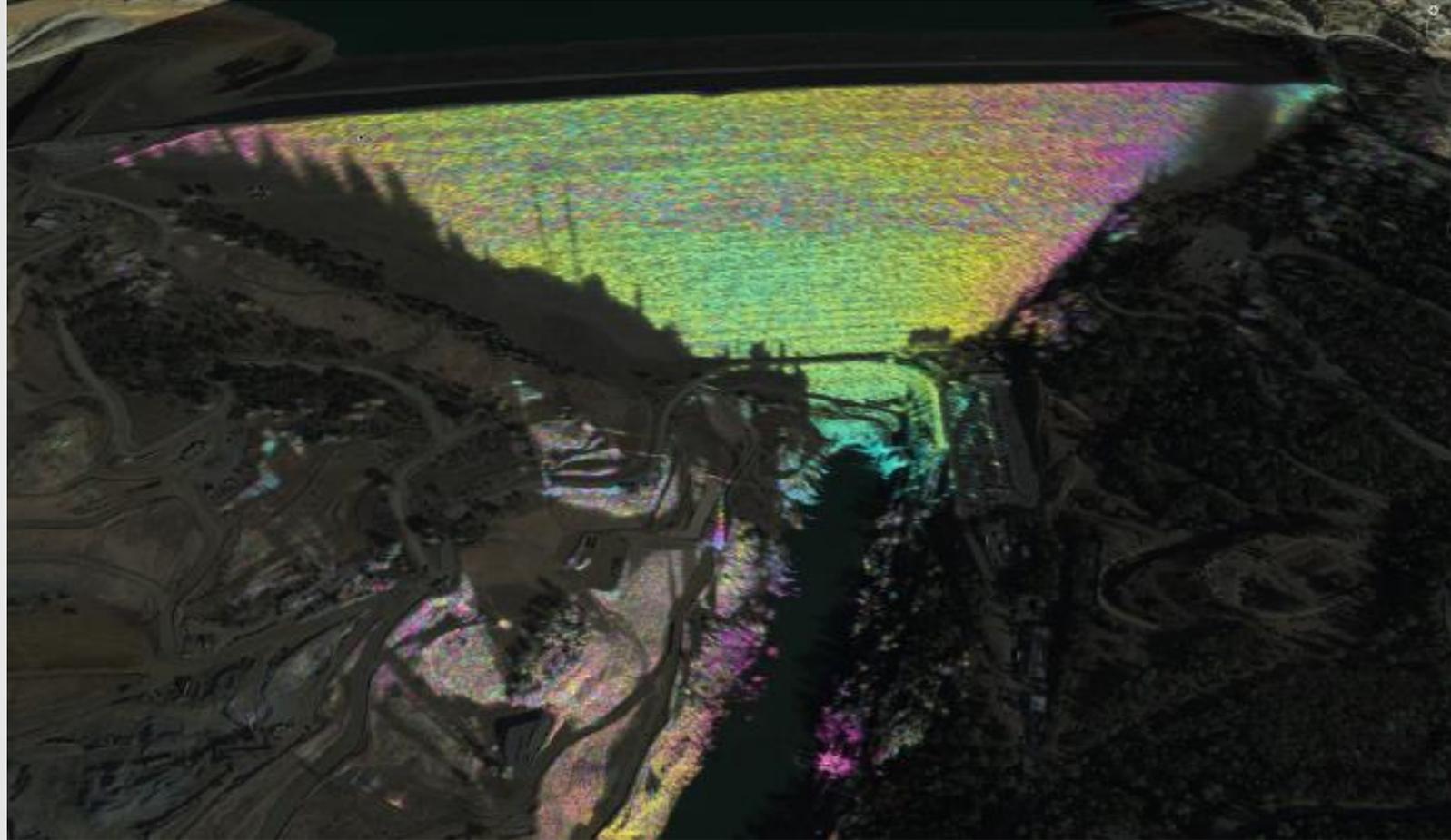


Embankment Deformation Monitoring

- Originated under CNA Task 6; evaluation of various technologies.
 - Spaceborne Radar
 - Terrestrial Radar
 - Airborne LiDAR
 - Waterborne Sonar



Photograph of the BFD Systems SE8 Unmanned Aerial Vehicle.



Radar image of Oroville Dam, as part of Oroville Comprehensive Needs Assessment Task 6 Pilot Projects



Updated Seismic Stability/Deformation Analysis

- December 2021: Work Plan submitted to Part 12D Independent Consultants, FERC, and DSOD for review and comment.
- May 2022: DSOD and Part12D Independent Consultant comments incorporated.
- The analysis will further inform the performance of the dam under a wide range of earthquake loading and reservoir conditions.
- Study anticipated to be completed in late 2024.

Oroville Dam Seismic Stability Study Plan

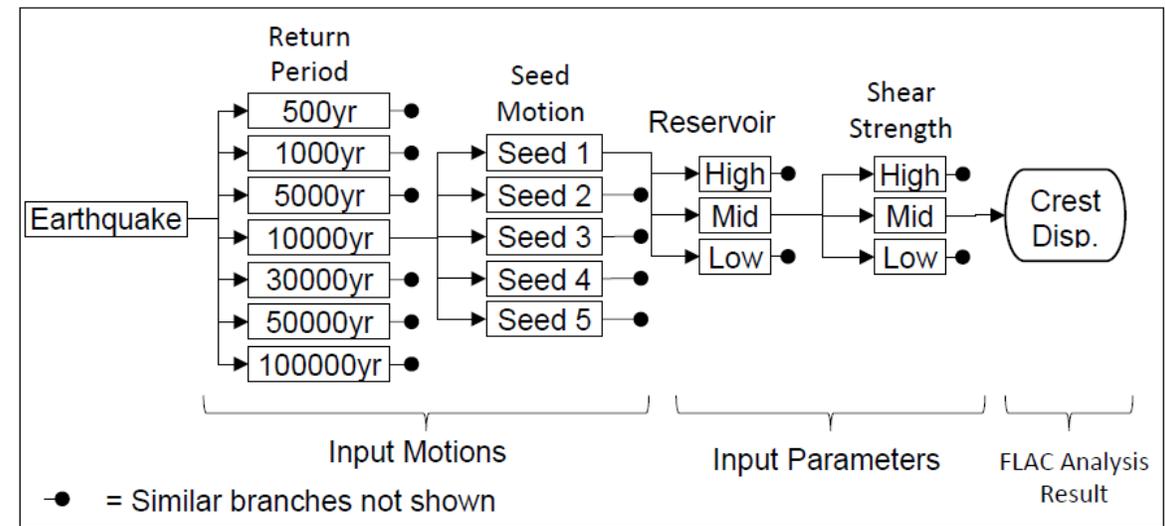
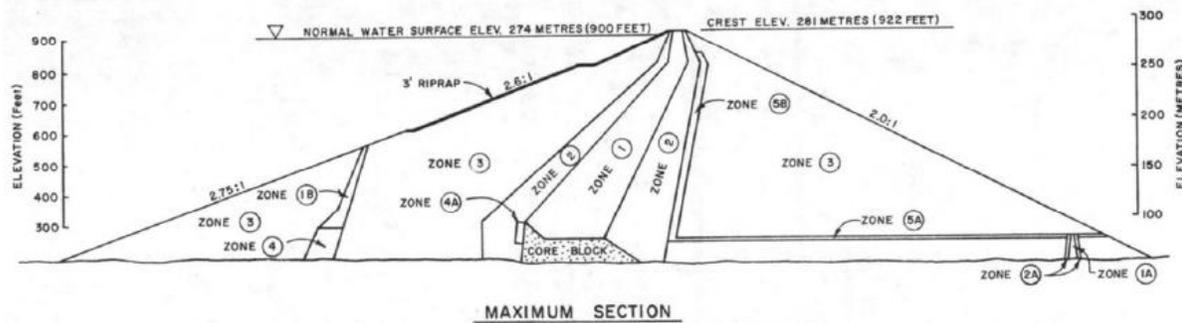
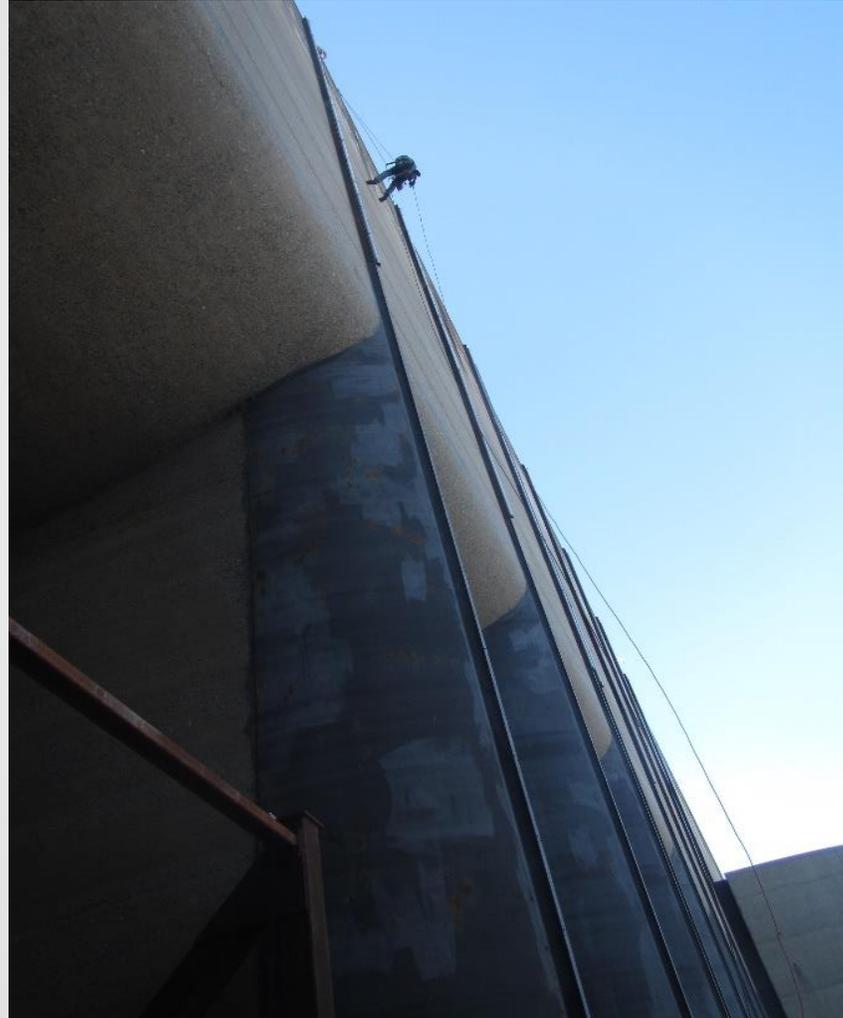


Figure 8 – Parametric Analysis Structure

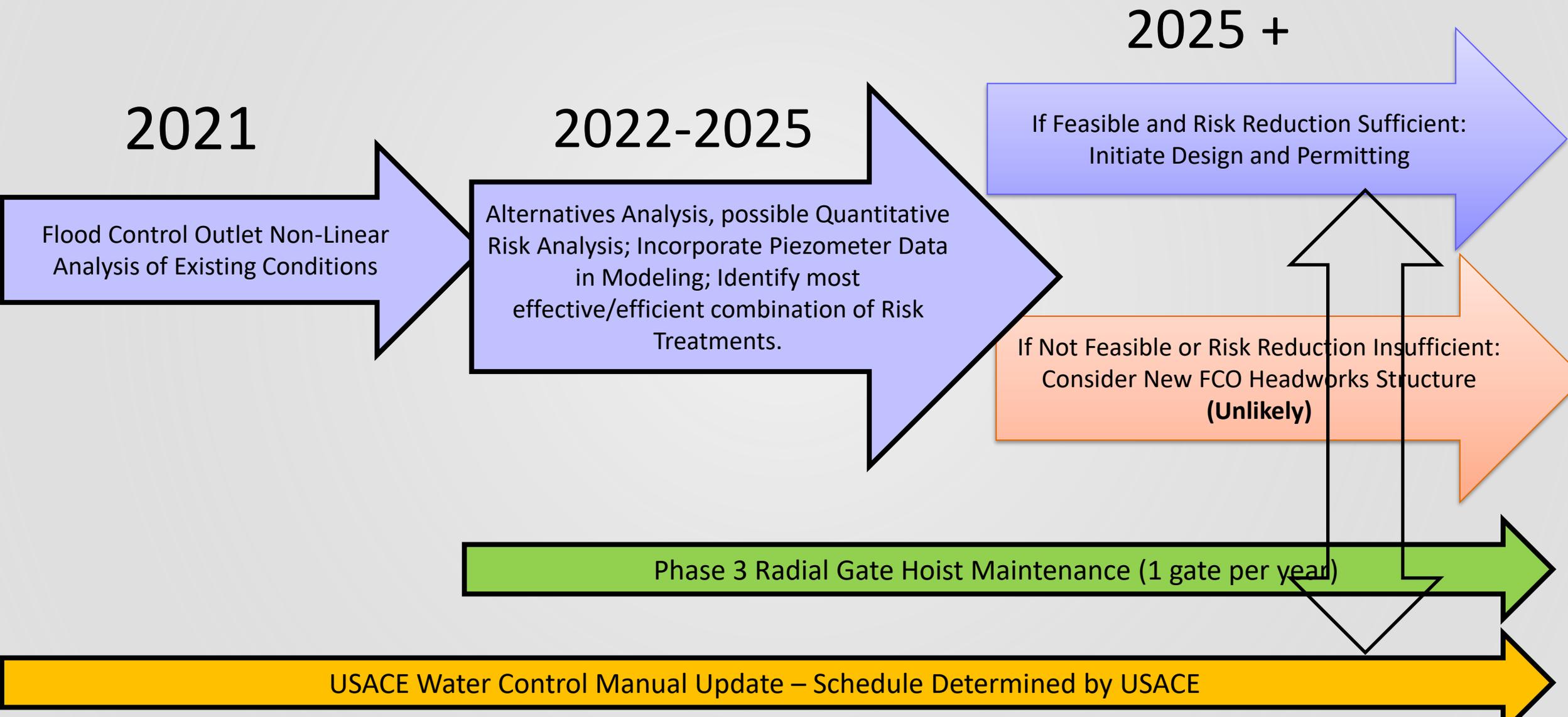


Flood Control Outlet (FCO) Projects

- 10-year Radial Gate Structural Inspection
- Radial Gate Phase 3 Maintenance Repairs; 2022-2030
- Monolith 25 & 26 Analyses – Retrofit Design Criteria; awaiting collection of piezometer data during high reservoir conditions, further refinement of model.
- 2022-2025: Alternatives Study, possible Quantitative Risk Analysis



Relationship between FCO Studies and Forecast Informed Reservoir Operations/Water Control Manual Update



Emergency Spillway – Further Studies

- \$300 million+/- improvements implemented for the Emergency Spillway during the Spillway Recovery.
- Between 2018-2020, DWR conducted two parallel risk assessments, the Comprehensive Needs Assessment, and the Level 2 Risk Analysis, the latter of which followed FERC's risk processes.
- Both studies found that risks associated with the Emergency Spillway were less than the risks associated with other areas we have been working and reporting on.
- DWR responded to FERC comments on the Probable Maximum Flood study on March 22, 2021. DWR indicated further studies evaluating the erodibility/performance of the Emergency Spillway would be implemented after studies for higher risks identified by the CNA and 10th Part 12D Independent Consultants.
- FERC July 14, 2022 Letter: Requested "*DWR develop and submit a detailed plan and schedule for determining the safe capacity of the emergency spillway and the spillway adequacy of Oroville Dam.*"
- DWR will submit the plan and schedule to FERC in September 2022 (60 Days).



Thank you

Questions?



ITEM 5 PUBLIC COMMENT

**The Oroville Dam Citizens Advisory
Commission will now take public comment.**

We appreciate your input.

ITEM 6 ADJOURN

Thank you all for joining us today, our next Oroville Dam Citizens Advisory Commission meeting will be on October 21, 2022.