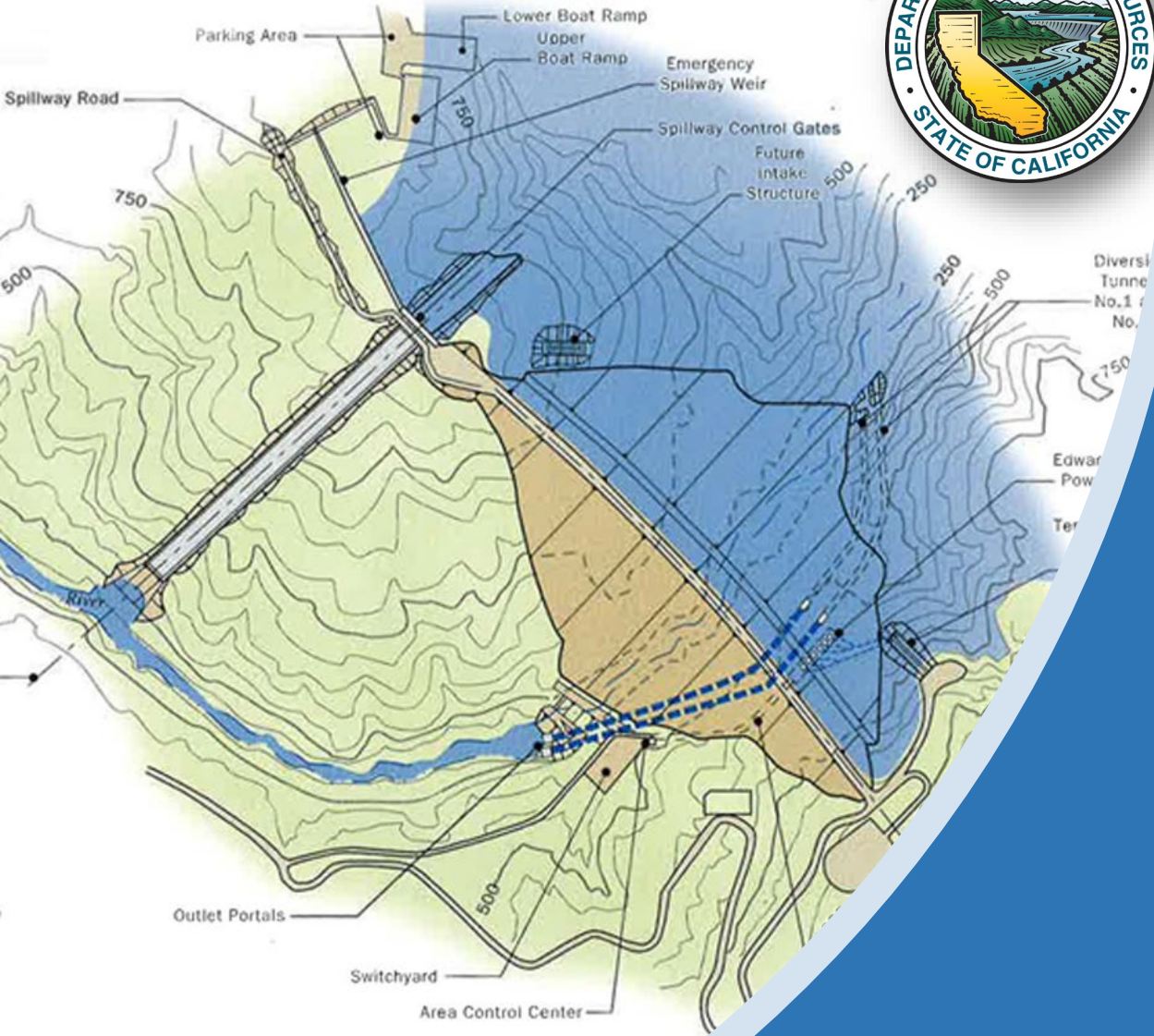




STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
OROVILLE DAM SAFETY
COMPREHENSIVE NEEDS ASSESSMENT



Oroville Independent Review Board

Memorandum #3
December 13-14, 2018 Meeting

Prepared for
Oroville Dam Safety Ad Hoc Committee Meeting No. 3
January 10, 2019



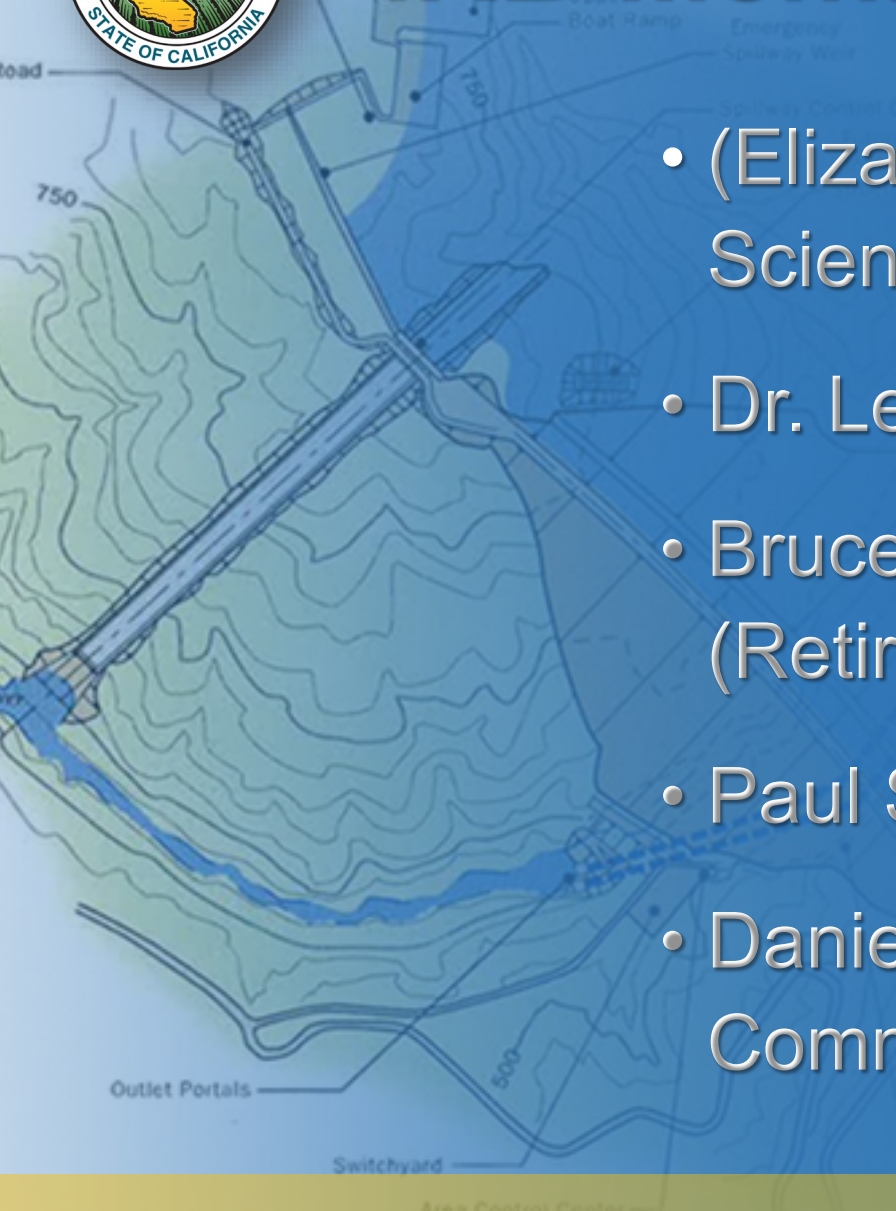


IRB Members



IRB Members

- (Elizabeth) Betty Andrews, Environmental Science Associates
- Dr. Lelio Mejia, Geosyntec Consultants
- Bruce Muller, US Bureau of Reclamation (Retired)
- Paul Schweiger, Gannett Fleming, Inc.
- Daniel Wade, San Francisco Public Utilities Commission





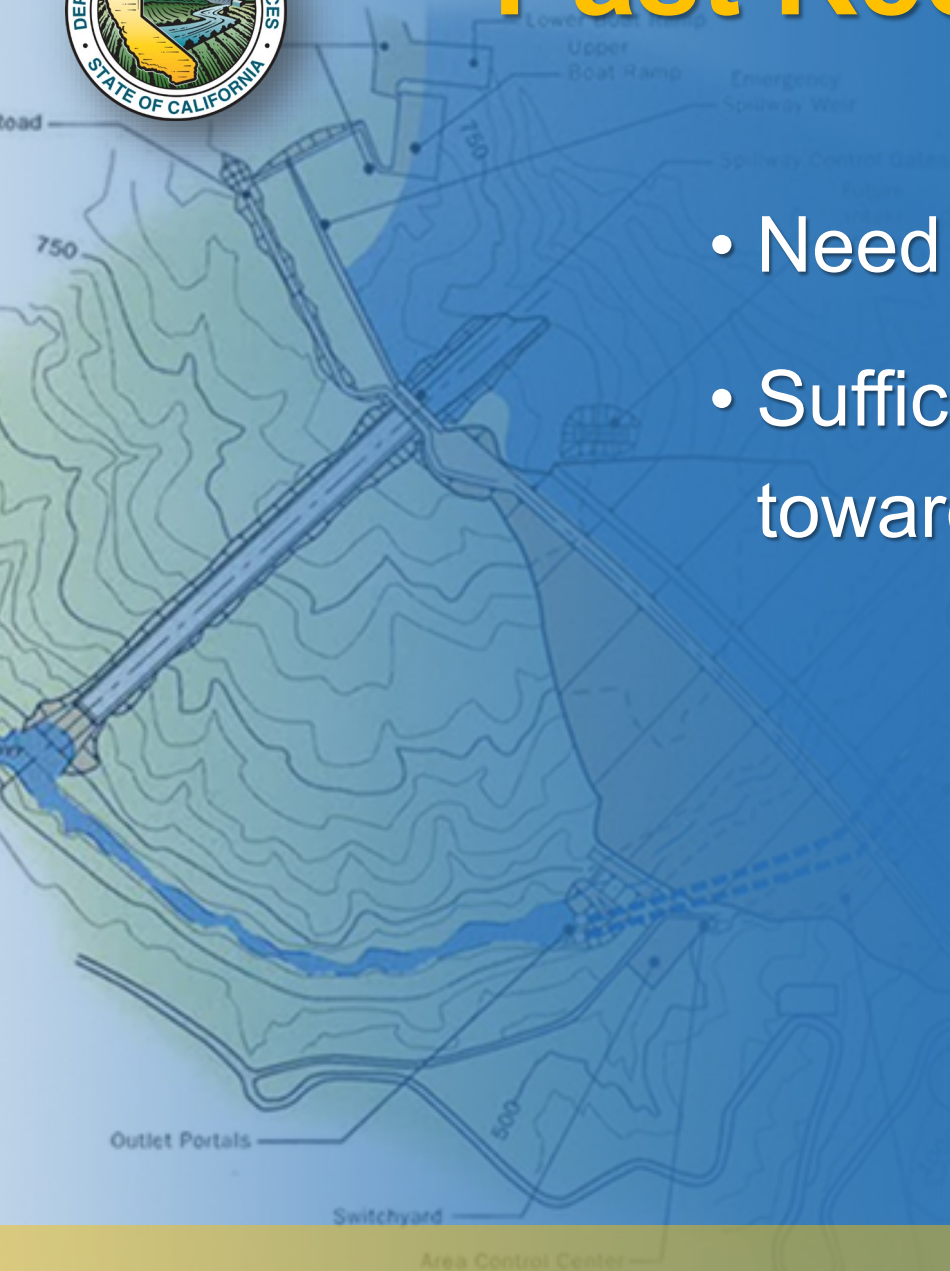
Past Recommendations

Comment Log



Past Recommendations (Comment Log)

- Need for common understanding of status
- Sufficient refinement to demonstrate progress toward resolution





Past Recommendations (Comment Log)

- Status Descriptions
 - **Under Consideration** – Project team is considering the recommendation, but hasn't committed to if or how the recommendation will be addressed.
 - **Planned** – The IRB has accepted the Project Team's response and an appropriate action is planned.
 - **In Progress** – The IRB sees evidence of the planned actions being underway.

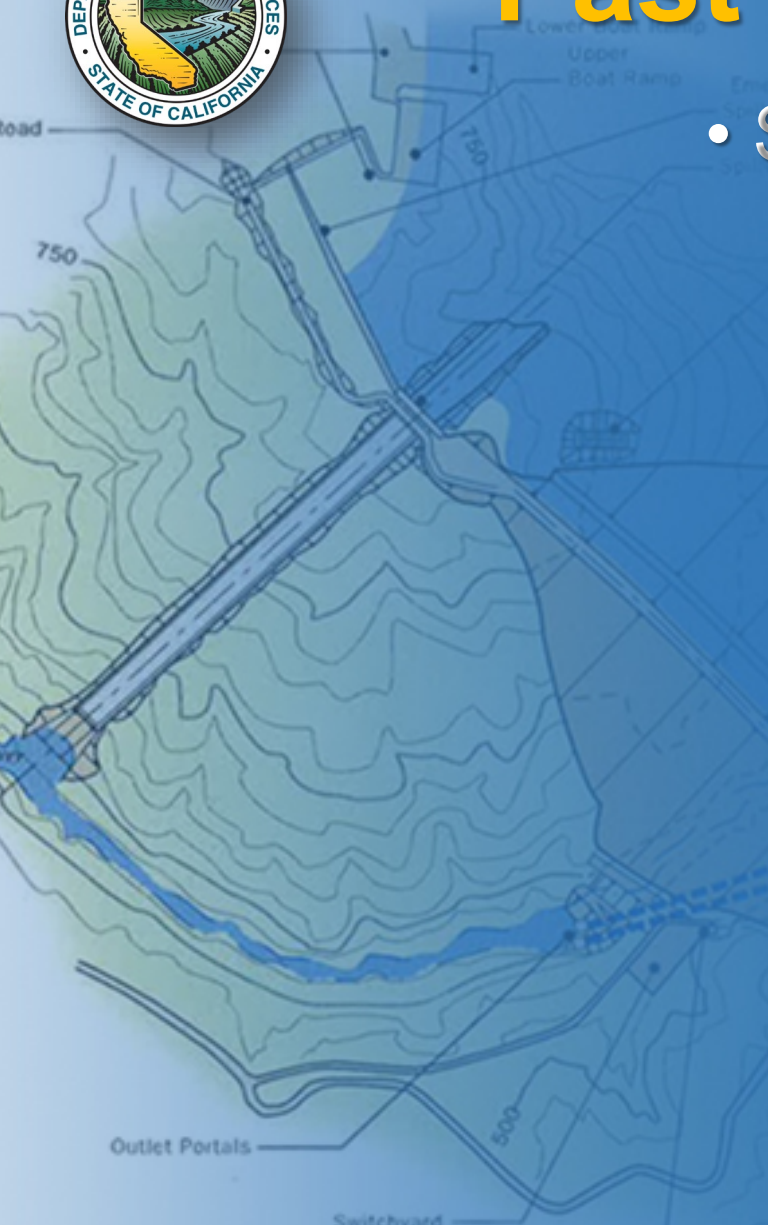




Past Recommendations (Comment Log)

- Status Descriptions

- **Closed** – The IRB has reviewed and confirmed that the Project Team’s planned action has been completed and adequately addressed.
- **Not Adopted** – The Project Team didn’t adopt the recommendation. An explanation has been or will be provided.
- **Superseded** – The IRB has revised a prior recommendation to provide additional clarity.





Past Recommendations (Comment Log)

Recommendation Status	IRB #1	IRB #2
Under Consideration	0	1
Planned	11	9
In Progress	6	3
Closed	4	1
Not Adopted	0	
Superseded	1	0
	22	14

Status as of 12/14/2018

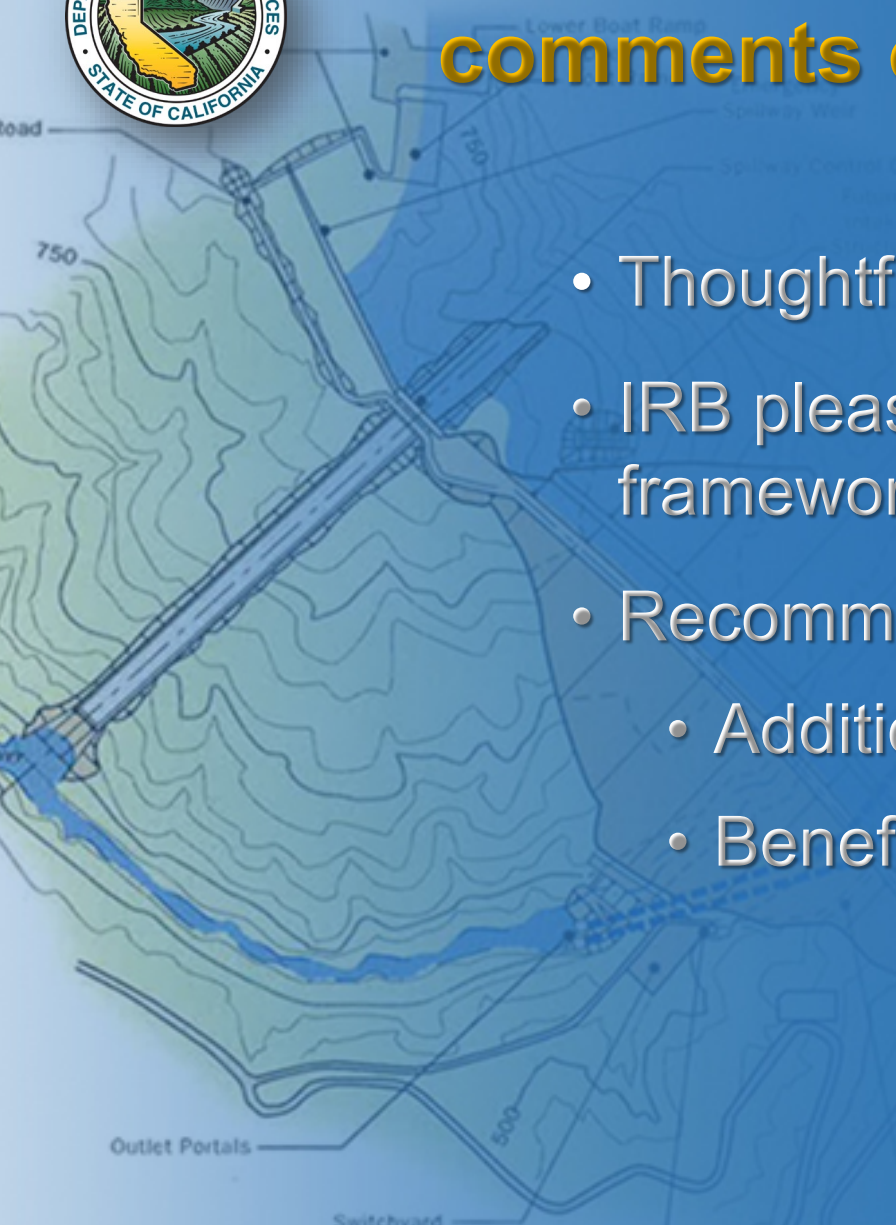


New Recommendations



1. Does the IRB have any recommendations or comments on the evaluation criteria/progress?

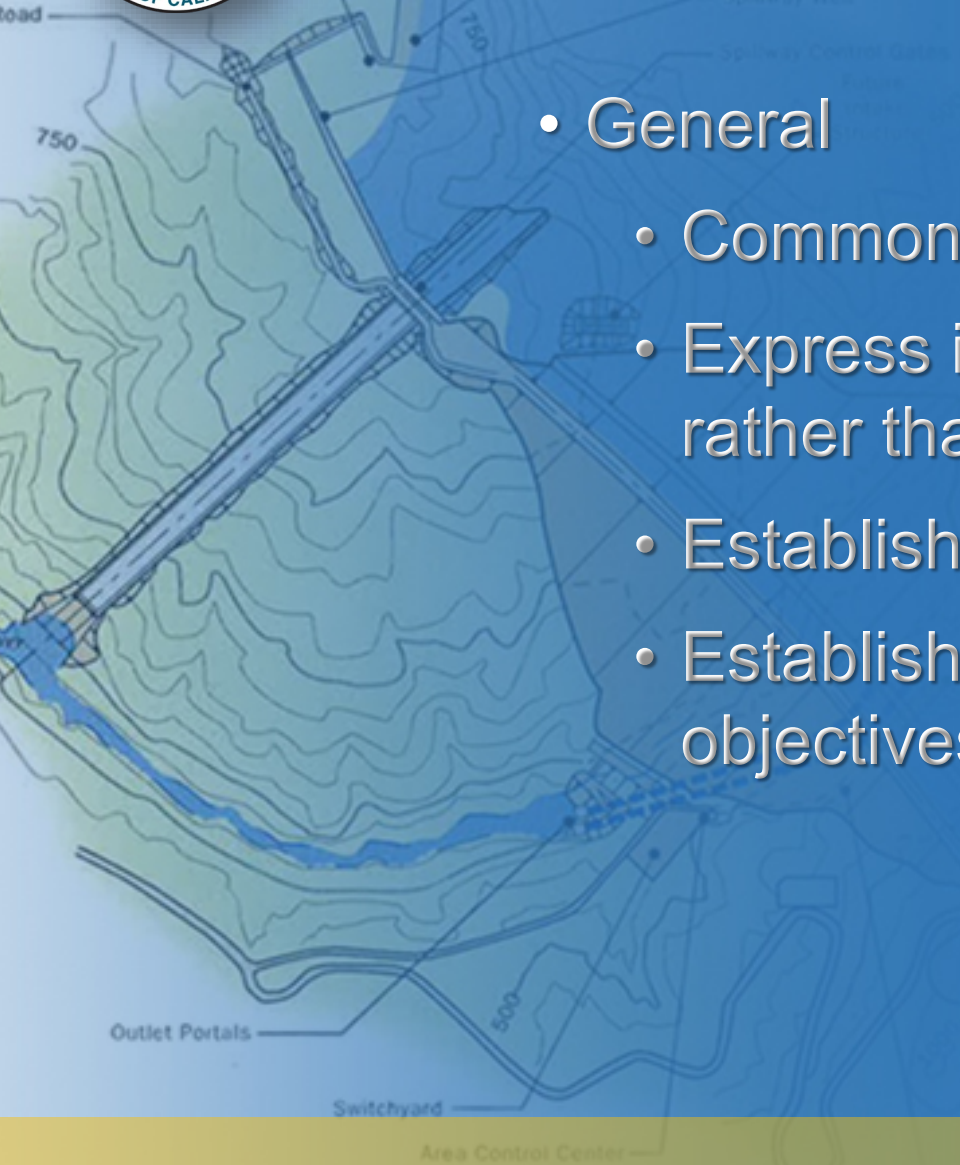
- Thoughtful and deliberate process.
- IRB pleased with selection of DWR's Asset Management framework for assessing risk.
- Recommend further development in the near term
 - Additional consequence/outcome categories
 - Beneficial project outcomes





2. Does the IRB have any recommendations or comments on the Task briefings?

- General
 - Common and consistent terminology.
 - Express issues clearly – focus objectives on outcomes rather than process.
 - Establish a minimum set of hard constraints.
 - Establish common format for tables of issues, objectives and constraints.

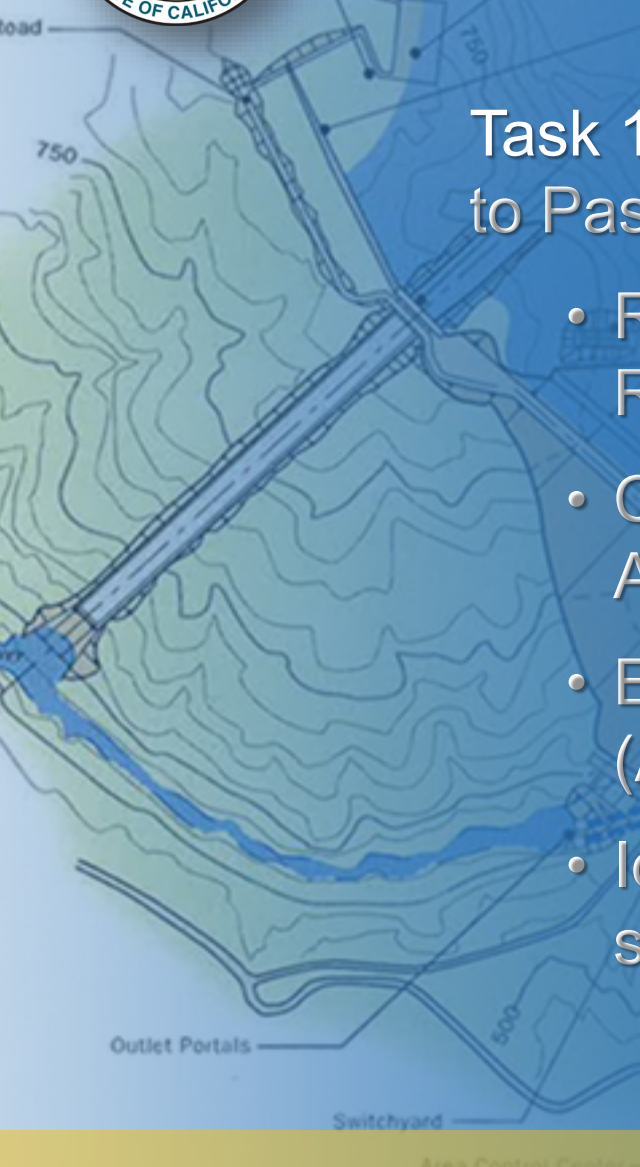




2. Does the IRB have any recommendations or comments on the Task briefings?

Task 1 – Alternatives Evaluation to Restore Spillway Design Capacity to Pass the Probable Maximum Flood (PMF).

- Revise Task title to “Evaluating Measures to Enhance Spillway Reliability and Resiliency.”
- Consider alignment with FEMA 94 – Guidelines for Selecting and Accommodating Inflow Design Floods for Dams.
- Establish performance standards for FCO and Emergency (Auxiliary) Spillway.
- Identify and assess data gaps related to geology between the secant pile wall and the river.

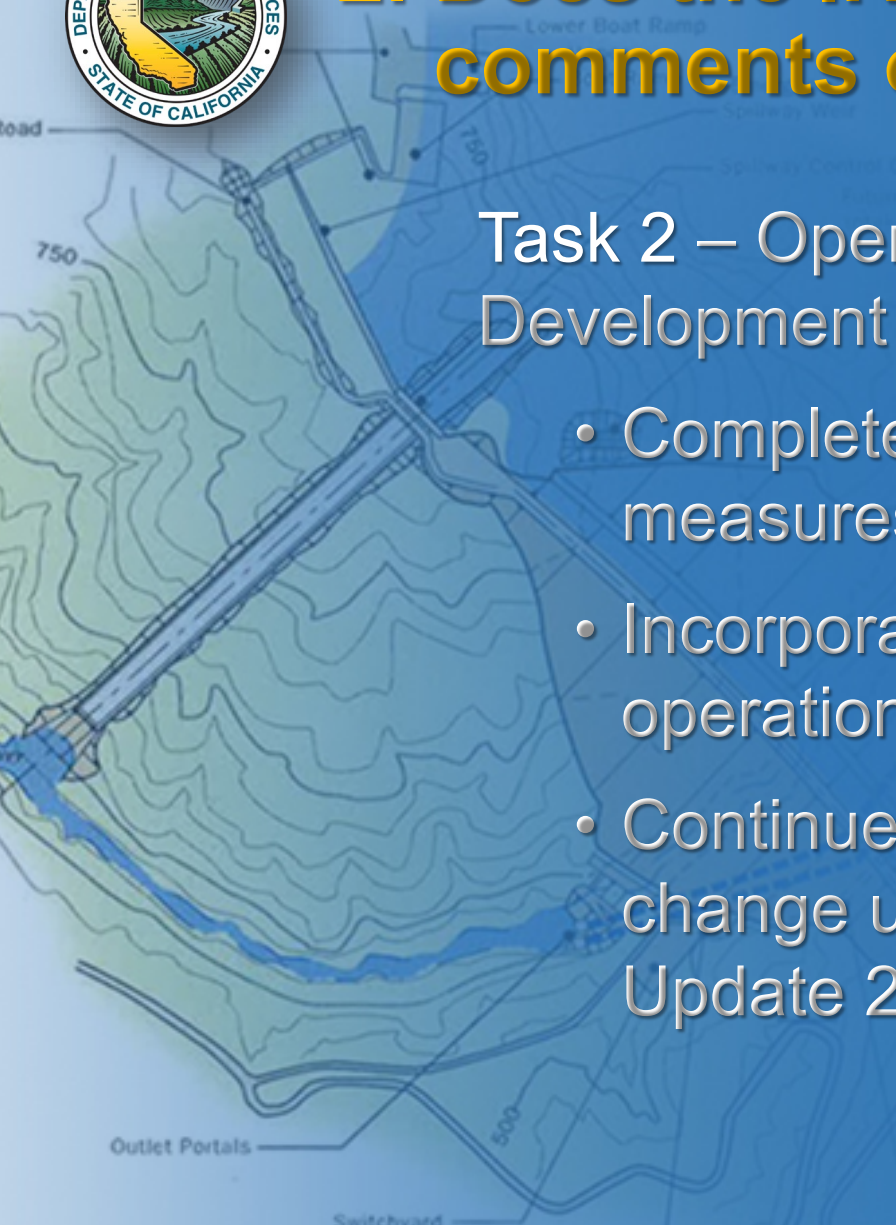




2. Does the IRB have any recommendations or comments on the Task briefings?

Task 2 – Operational Needs Assessment to Support Development of Alternative Reservoir Outflow Enhancements.

- Complete assessment of issues prior to formulating measures.
- Incorporate any physical changes since 1970 into flood operations procedures.
- Continue consideration of strategy for addressing climate change used in Central Valley Flood Protection Plan Update 2017.





2. Does the IRB have any recommendations or comments on the Task briefings?

Task 4 – Alternatives Evaluation for Low-Level Outlet.

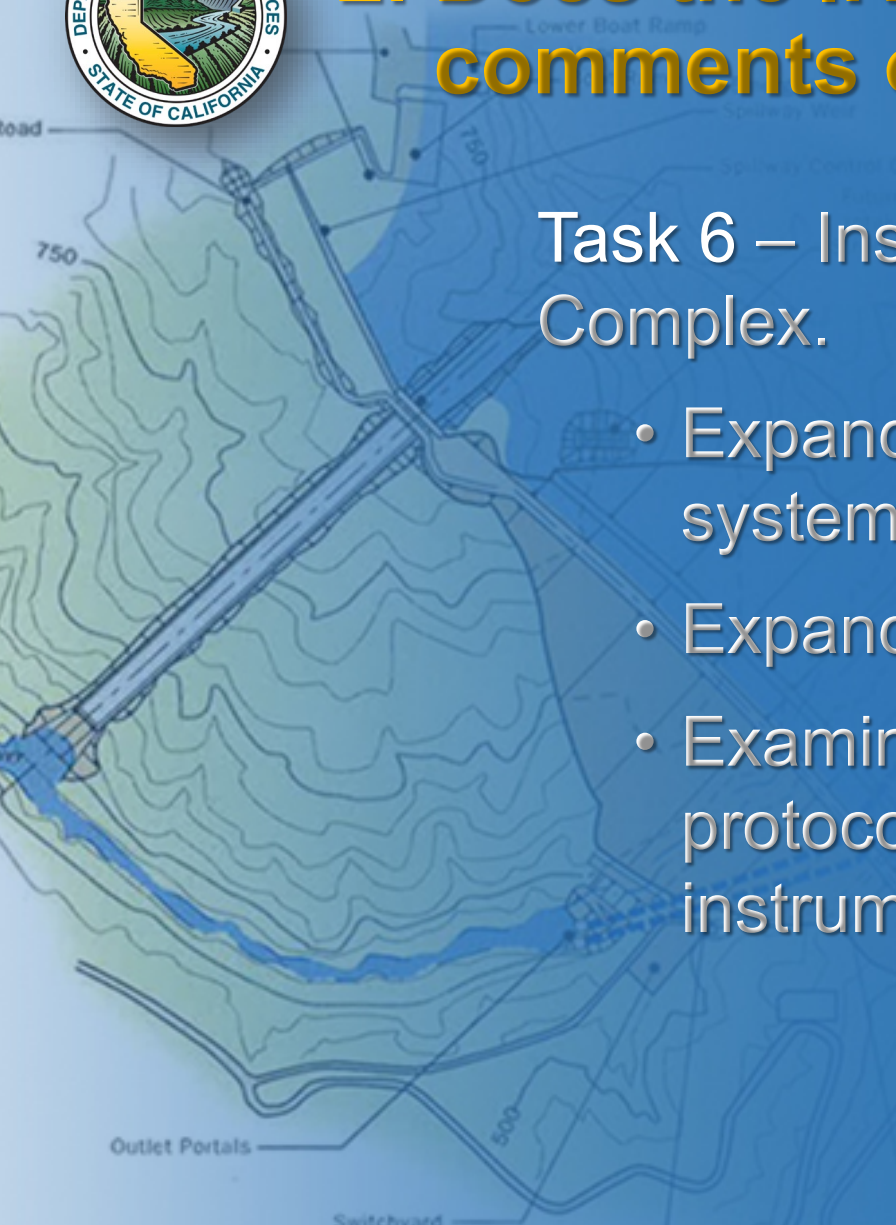
- When identifying measures, identify whether they directly achieve reliability or do so through redundancy.
- Focus more on good engineering practice and less on regulatory requirements.
- Objective T4-3 - "... provide additional capacity *and flexibility* for routine reservoir operations ..."
- Additional documentation/verification of assumptions for drawdown calculations.
- Ensure assessment of construction risk for measures proposed.



2. Does the IRB have any recommendations or comments on the Task briefings?

Task 6 – Instrumentation and Monitoring for the Oroville Dam Complex.

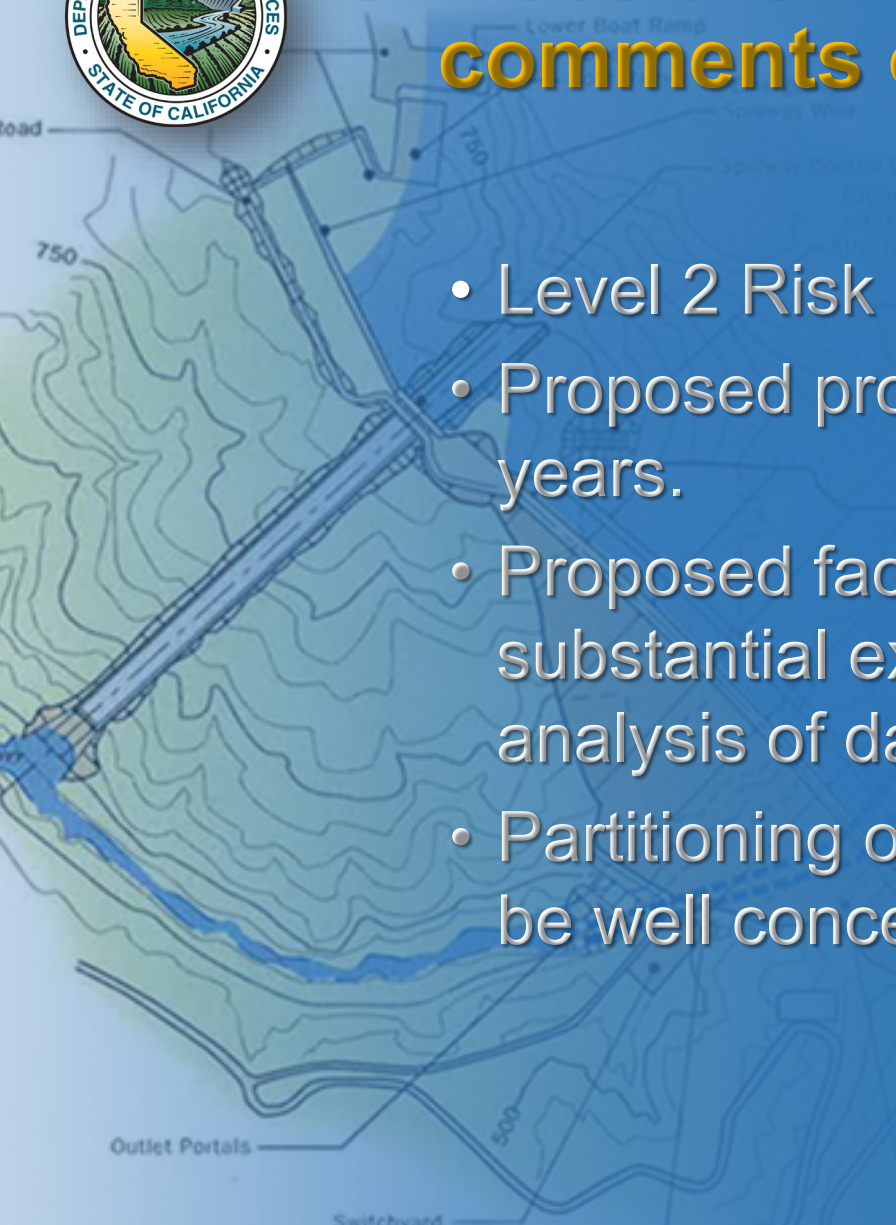
- Expand focus to include mechanical and electrical systems critical to operations.
- Expand scope to include visual monitoring.
- Examine accuracy of inflow forecasts and document protocol for loss of communications with upstream instruments.





3. Does the IRB have any recommendations or comments on the Part 12D Level 2 briefing?

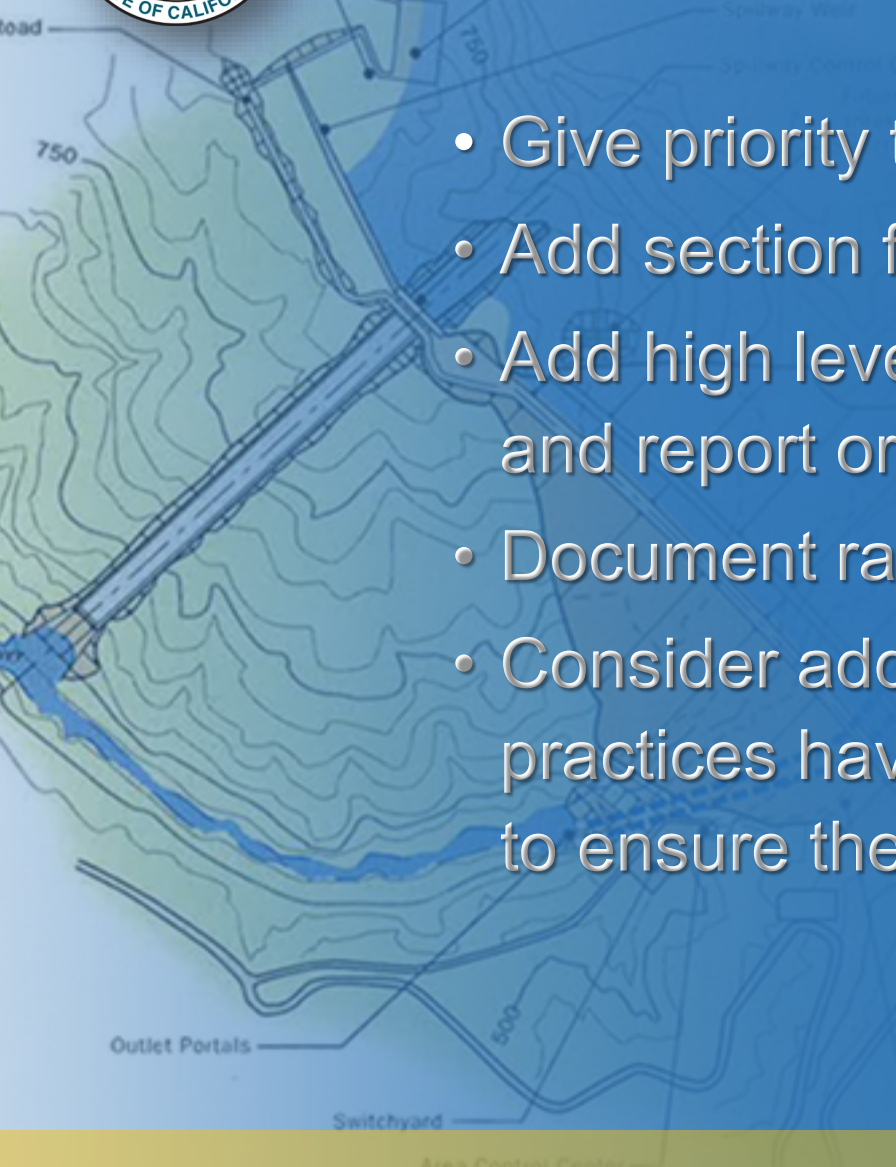
- Level 2 Risk analysis will benefit the CNA study.
- Proposed process has been used in the federal sector for 20 years.
- Proposed facilitators, SME's, recorders and reviewers have substantial experience in both dam engineering and risk analysis of dams.
- Partitioning of the risk analysis due to complexity seems to be well conceived.





4. Does the IRB have any recommendations or comments on the final report outline?

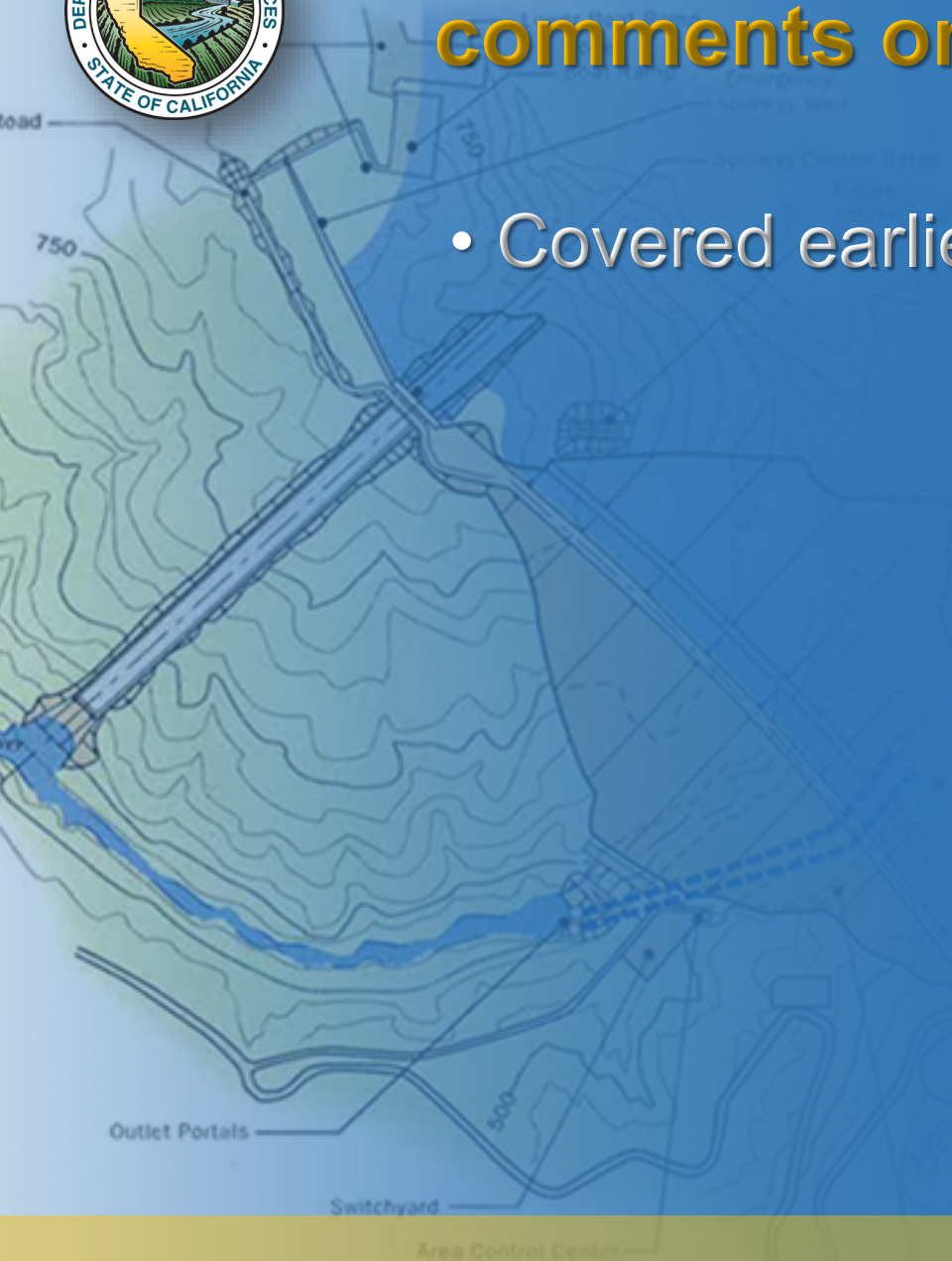
- Give priority to similar outlines for task reports.
- Add section for description of significant modifications.
- Add high level description of project motivation, approach and report organization.
- Document rationale for the 6 tasks.
- Consider adding descriptions of how and why design practices have evolved since 1969 – emphasize goal being to ensure the dam meets/exceeds current design standards.





5. Does the IRB have any recommendations or comments on the IRB Comments Log?

- Covered earlier in the presentation

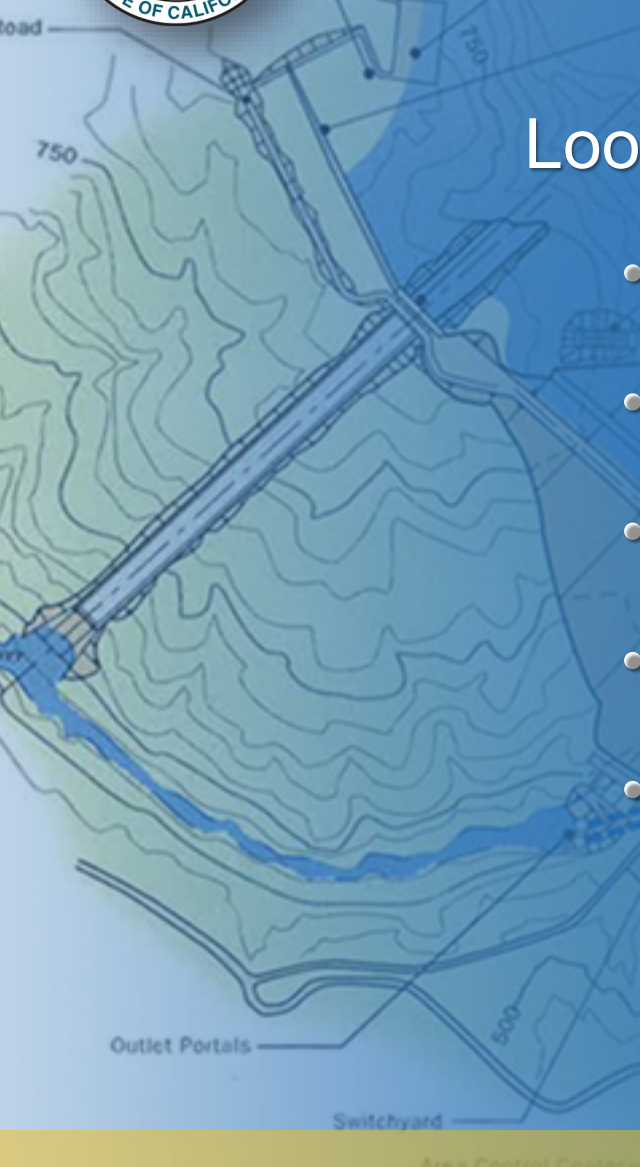


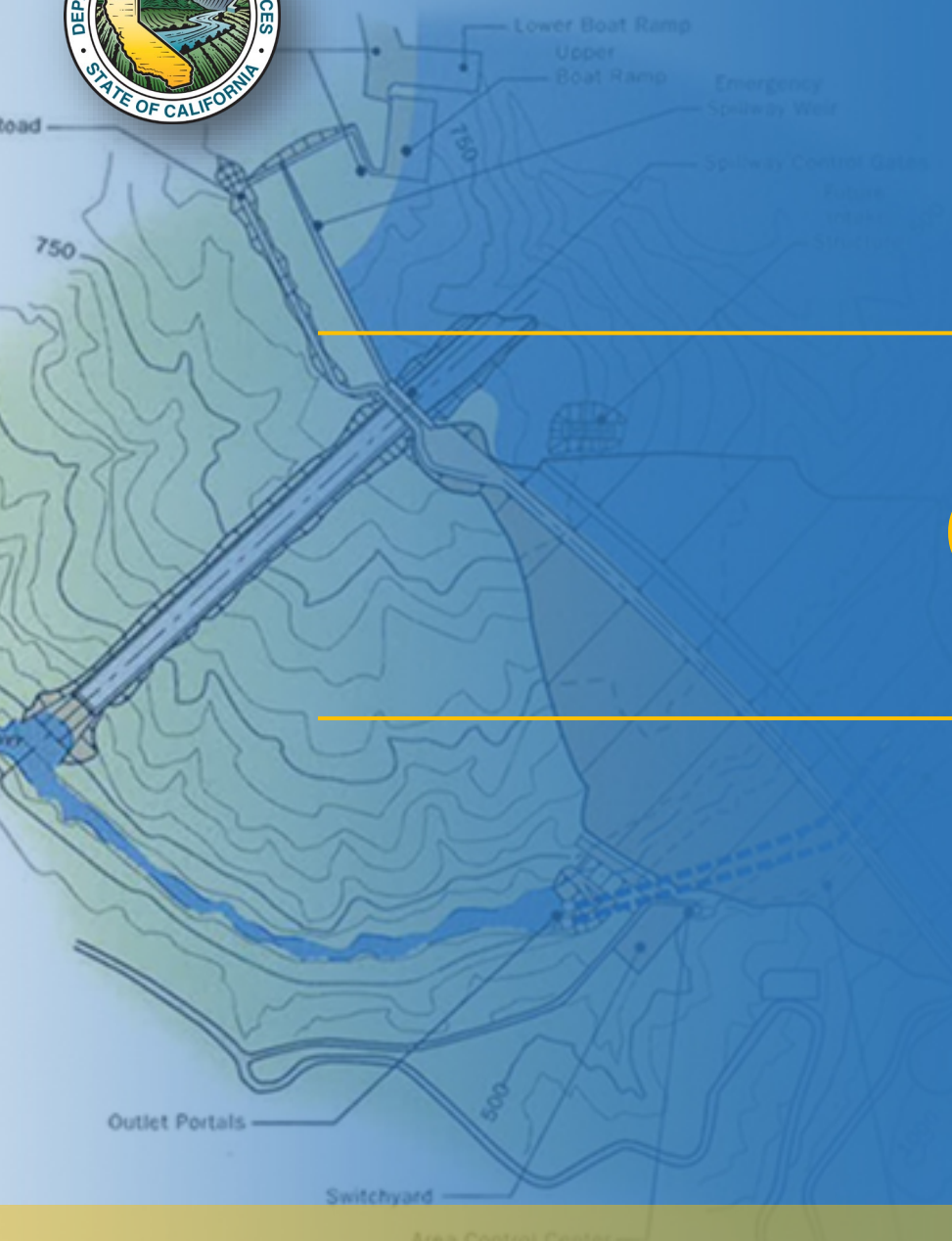


6. Does the IRB have any other recommendations or comments?

Looking forward to hearing about the following at IRB #4:

- Schedule progress.
- Initial results from Level 2 Risk Assessment.
- Definition of issues/objectives/constraints tables.
- Final draft of the evaluation framework.
- Outlines of the task reports contained in the appendices.





Questions?