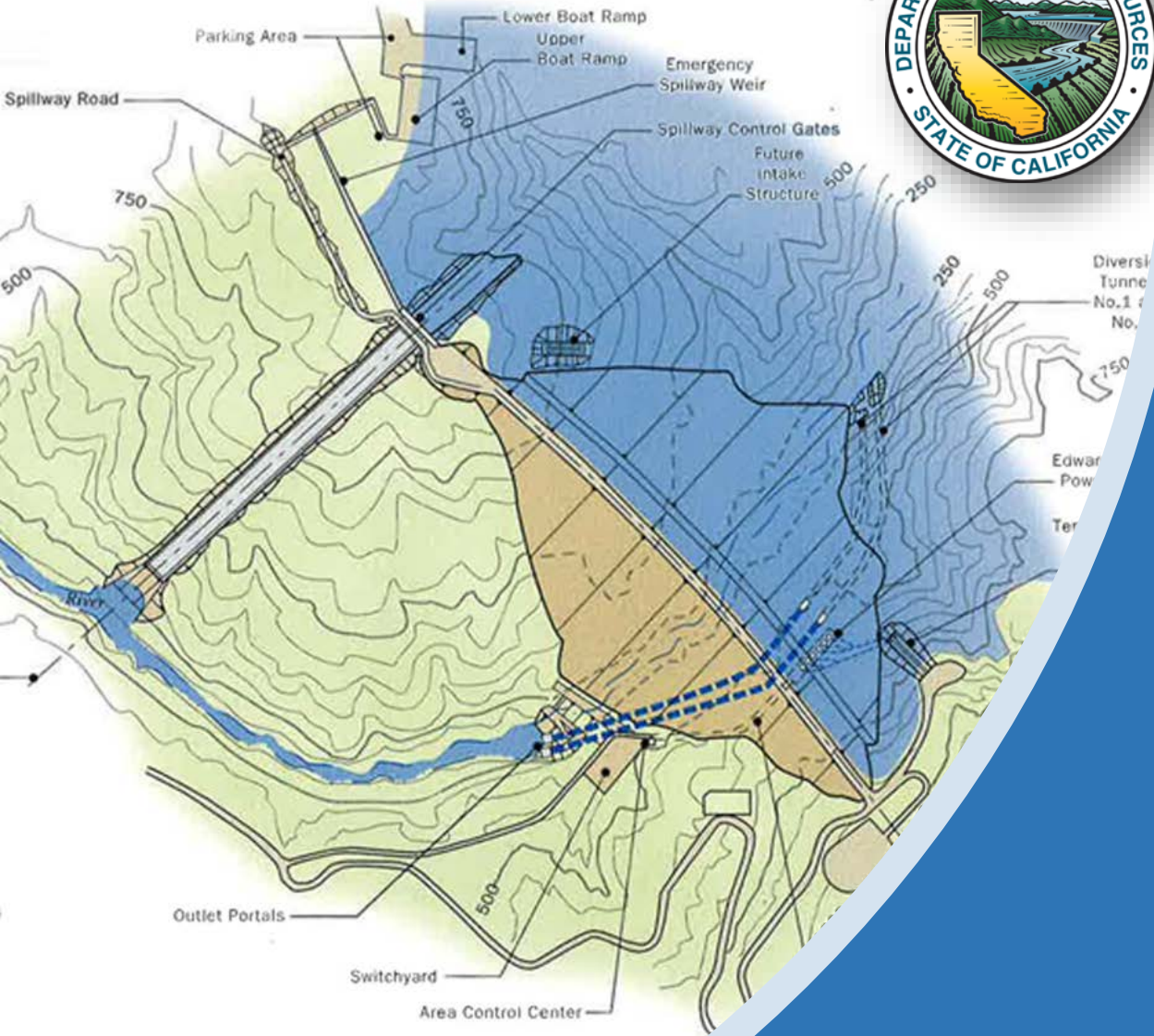




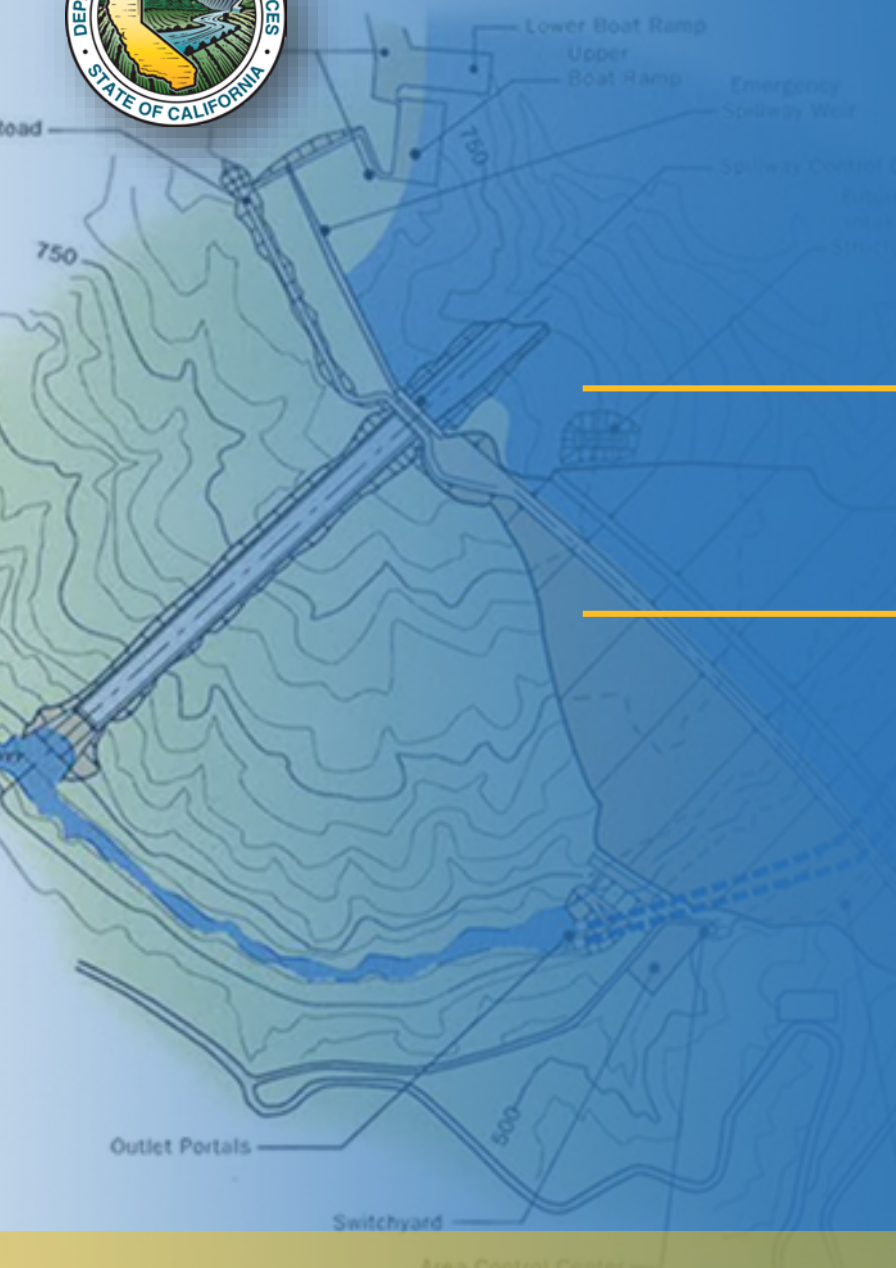
STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
**OROVILLE DAM SAFETY
COMPREHENSIVE NEEDS ASSESSMENT**



Independent Review Board Memoranda #7 and #8

Oroville Independent Review Board
Meeting No. 7 February 27-28, 2020
Meeting No. 8 May 21-22, 2020



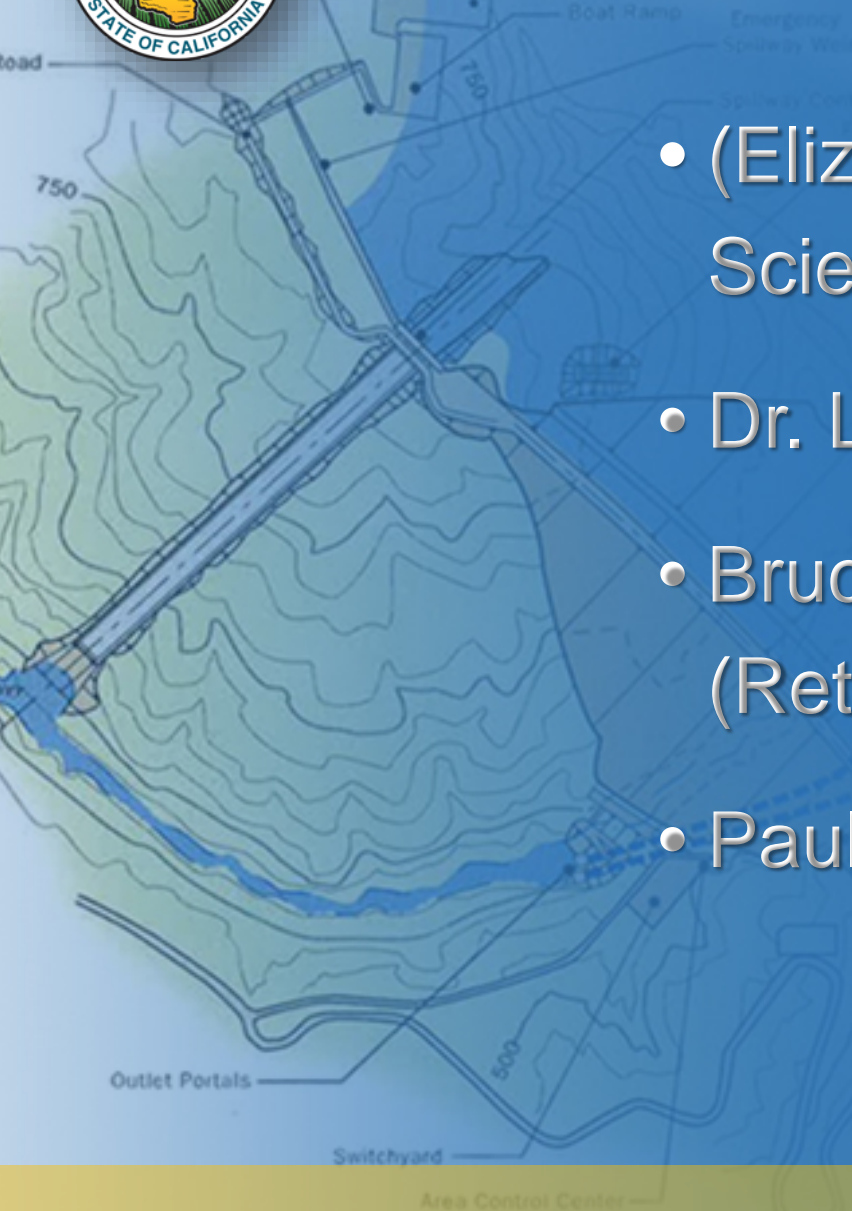


IRB Members



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.





Past Recommendations

Comment Log



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.

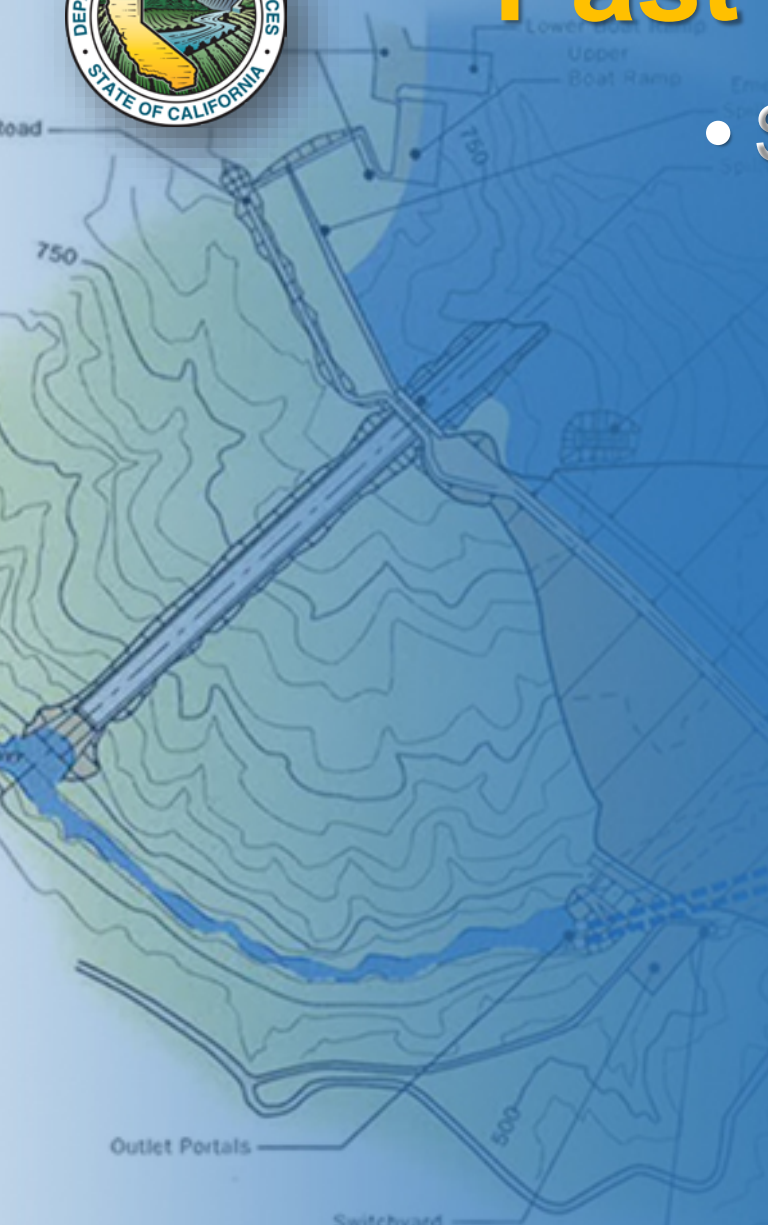




Past Recommendations (Comment Log)

- 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- **Superseded** – The IRB has revised a prior recommendation to provide additional clarity.

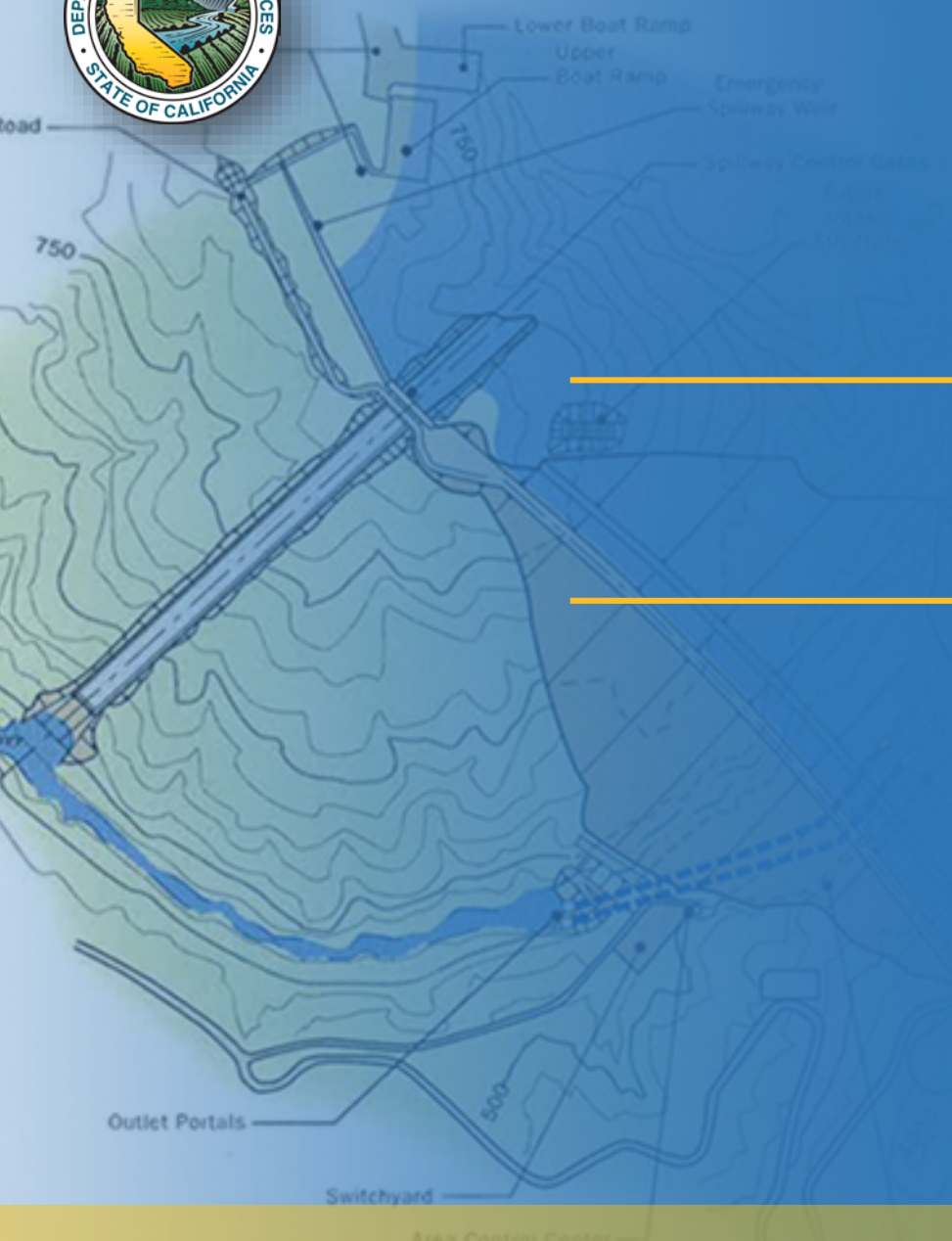




Past Recommendations (Comment Log)

Recommendation Status	IRB #1	IRB #2	IRB #3	IRB #4	IRB #5	IRB #6	IRB #7	Total
Under Consideration	0	0	0	0	0	0	0	0
Planned	0	0	1	0	0	0	1	2
In Progress	3	4	0	1	0	2	3	13
Closed	18	9	10	3	3	4	6	53
Not Adopted	0	1	1	0	2	0	0	4
Superseded	1	0	0	0	0	0	0	1
	22	14	12	4	5	6	10	73

Status as of 5/22/2020

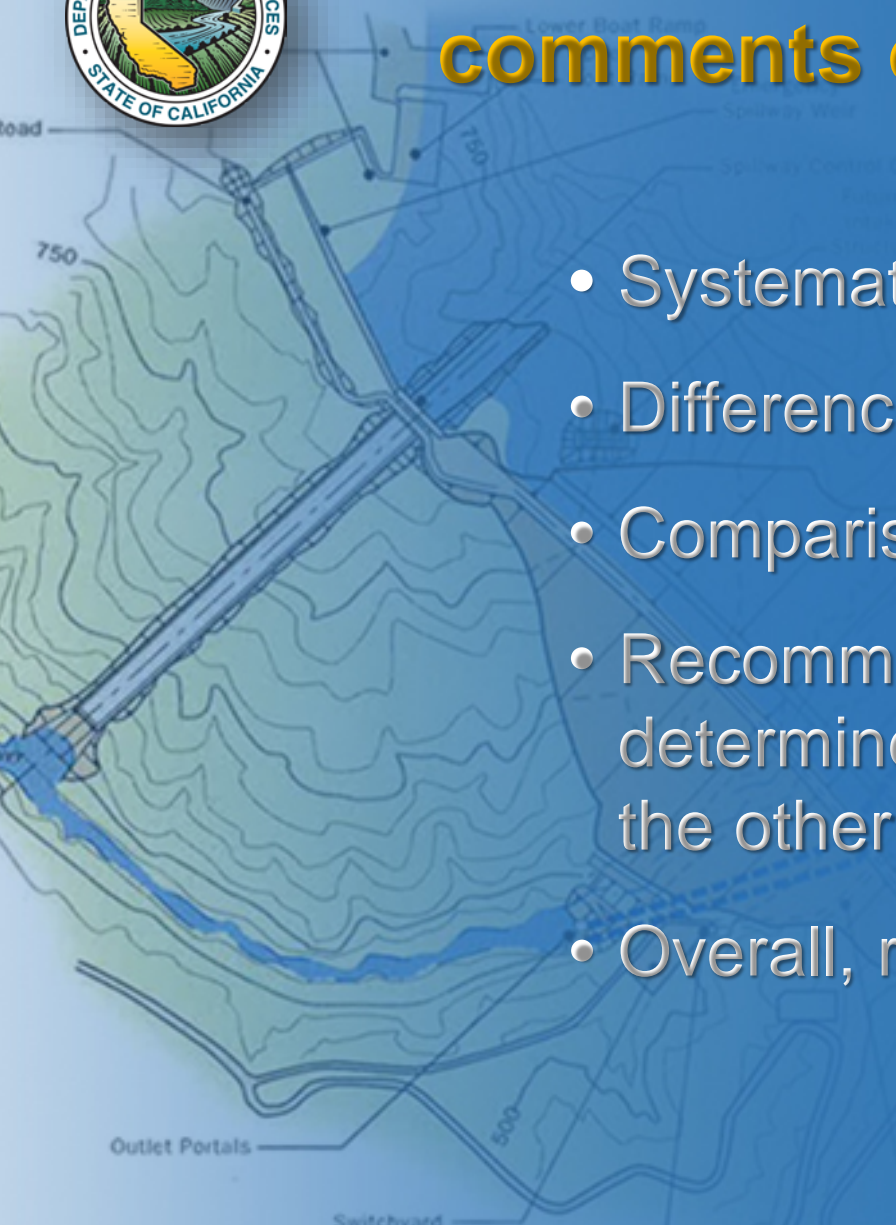


Report #7



1. Does the IRB have any recommendations or comments on the summary of risk assessments?

- Systematic evaluation of PFMs
- Differences from IRB #6 reviewed
- Comparisons with L2RA effort are mostly consistent
- Recommend reviewing significant differences to determine if one group is systemically higher/lower than the other
- Overall, risks appear generally low

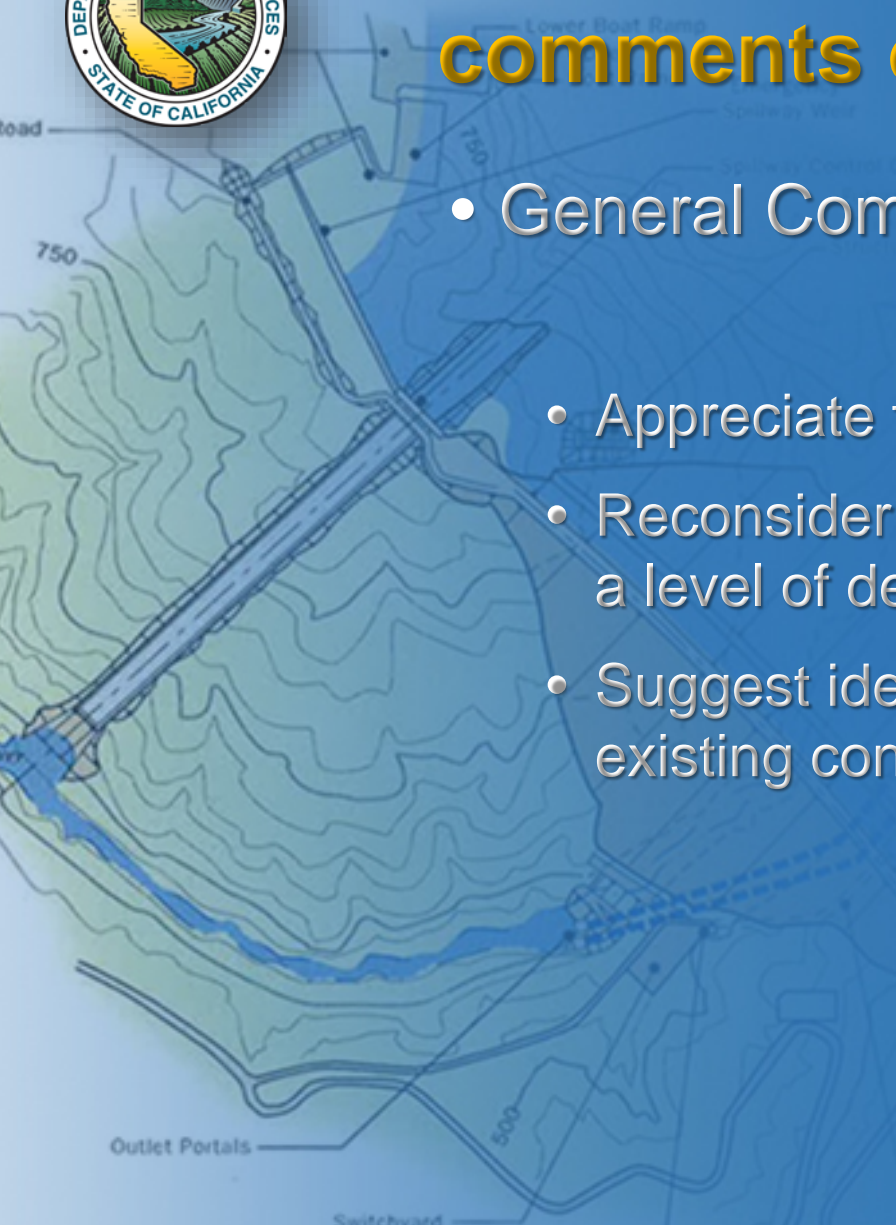




2. Does the IRB have any recommendations or comments on the status of reports?

- General Comments

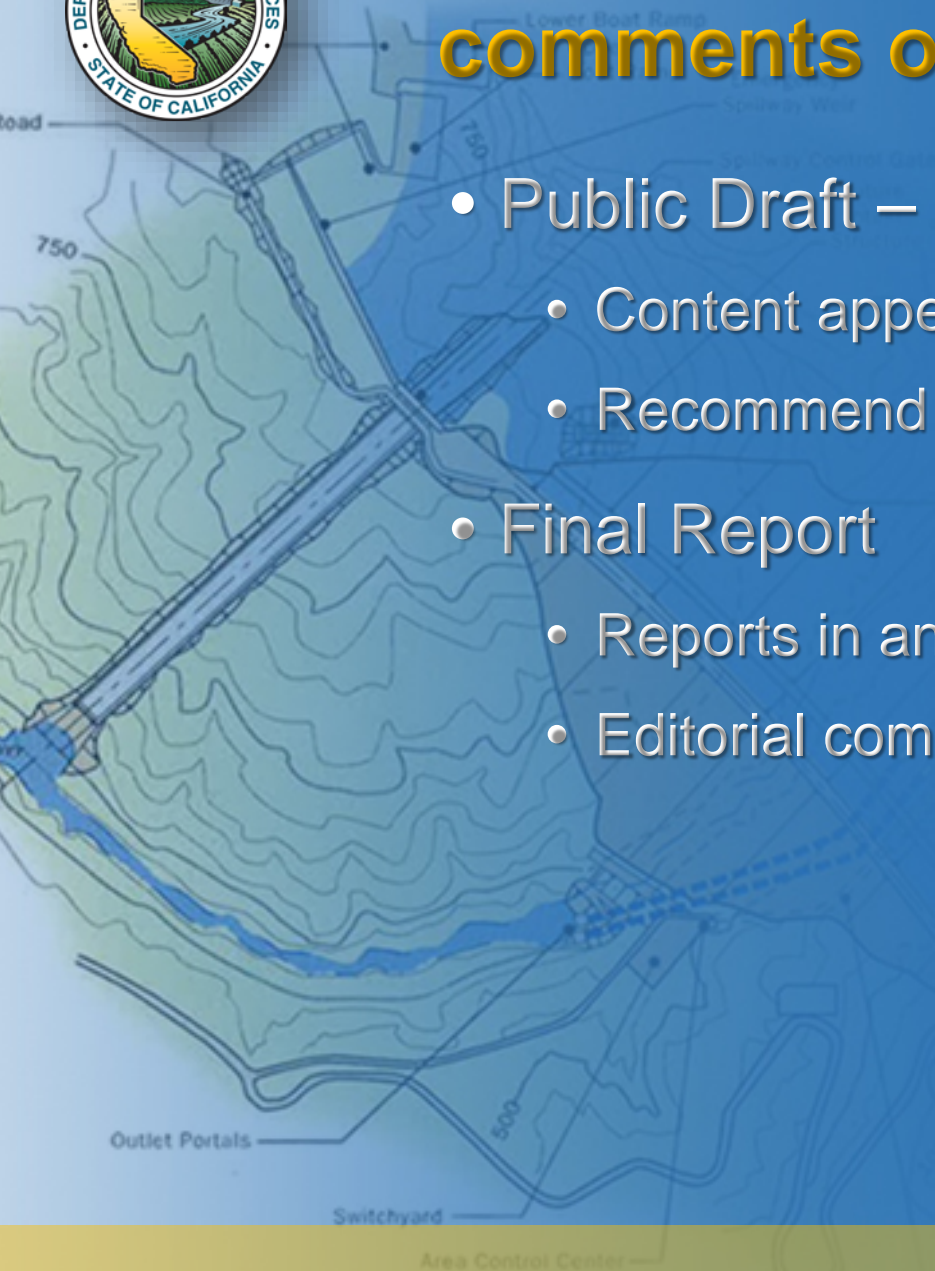
- Appreciate the use of color to identify PFMs and risk levels
- Reconsider use of the term “recommended measures” as this may convey a level of definitiveness not intended
- Suggest identifying documents and data sources used to characterize existing conditions





2. Does the IRB have any recommendations or comments on the status of reports?

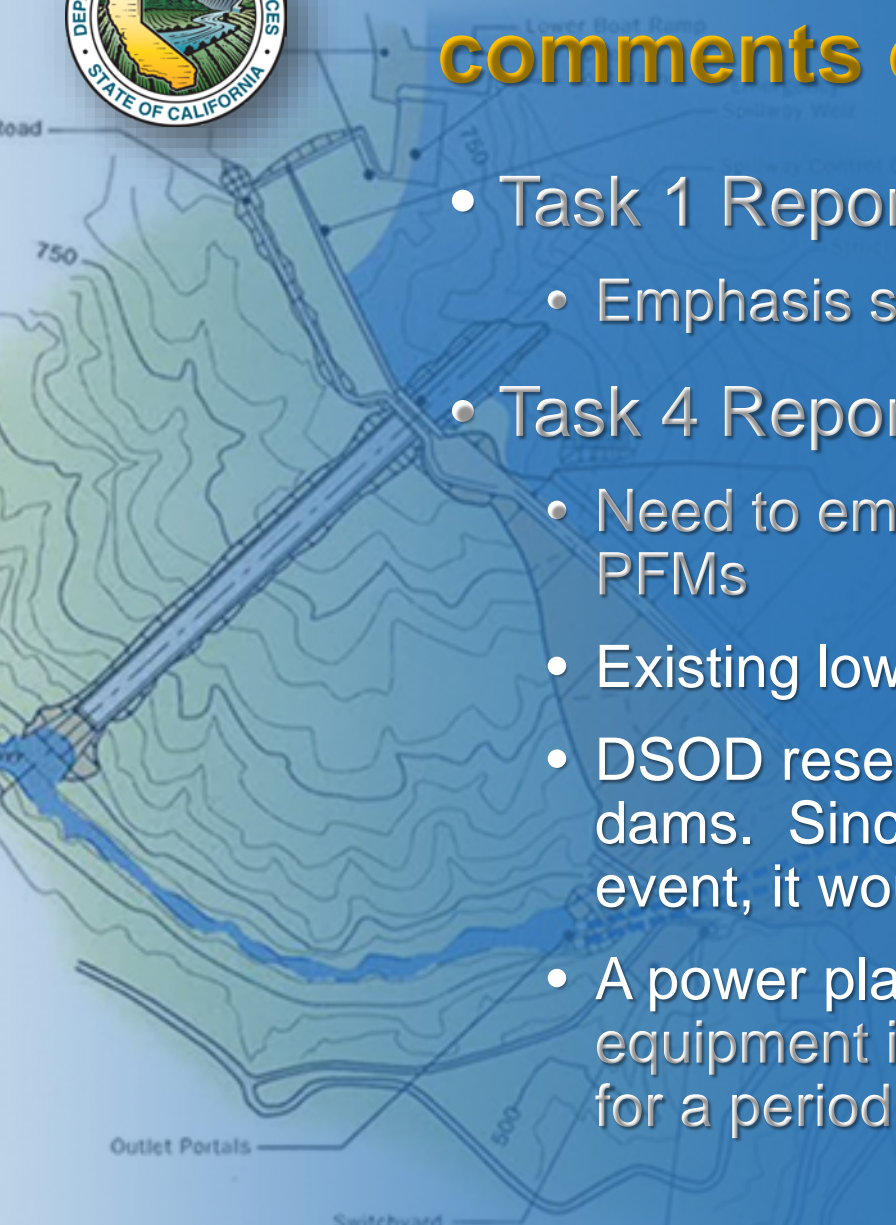
- Public Draft – (Table of Contents)
 - Content appears appropriate
 - Recommend including discussion of risk and ALARP principles
- Final Report
 - Reports in an advanced stage of preparation
 - Editorial comments provided separately





2. Does the IRB have any recommendations or comments on the status of reports?

- Task 1 Report
 - Emphasis should be added regarding the importance of Hyatt Power Plant
- Task 4 Report
 - Need to emphasize the role of a low level outlet in reducing risk for all PFMs
 - Existing low level outlet capacity does not meet DSOD guidelines
 - DSOD reservoir evacuation guidelines are commonly applied to new dams. Since Oroville Dam has never been tested by a significant seismic event, it would be desirable and prudent to meet the guidelines.
 - A power plant roof rock fall may have financial consequences even if no equipment is damaged – Personnel safety considerations may limit access for a period of time.





2. Does the IRB have any recommendations or comments on the status of reports?

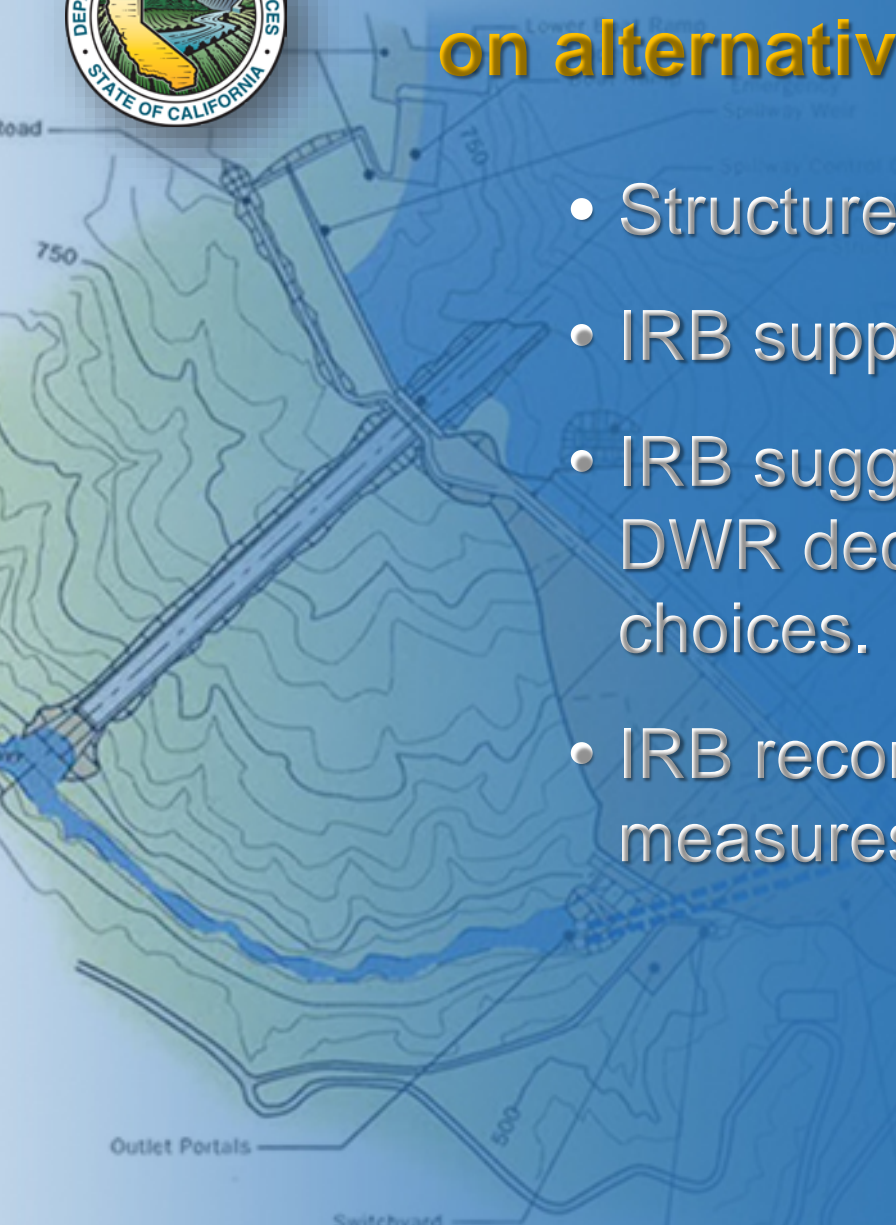
- Task 5 Report
 - Identify studies that contributed to the CNA study, i.e. the study of the vegetated area
 - Recommend discussing the hydraulic conditions in the reservoir under extreme hydrologic loads that lead to a higher risk of overtopping at Parish Camp Saddle Dam





3. Does the IRB have any recommendations or comments on alternative plan formulation and recommendations?

- Structured process for formulating alternative plans
- IRB supports “effectiveness scoring” approach.
- IRB suggests that the full suite of plans be presented to DWR decision makers to allow a more rich set of choices.
- IRB recommends expedited implementation of low cost measures that are part of all alternative plans.





4. Does the IRB have any recommendations or comments on the comment log discussion?

- Updated with IRB perspectives as of 2/28/2020
- M01-16 – Climate change studies won't be ready for inclusion in CNA
 - IRB suggests discussion in the CNA of how climate change will be addressed as plans and/or measures are advanced.





5. Does the IRB have any recommendations or comments on the schedule and next steps?

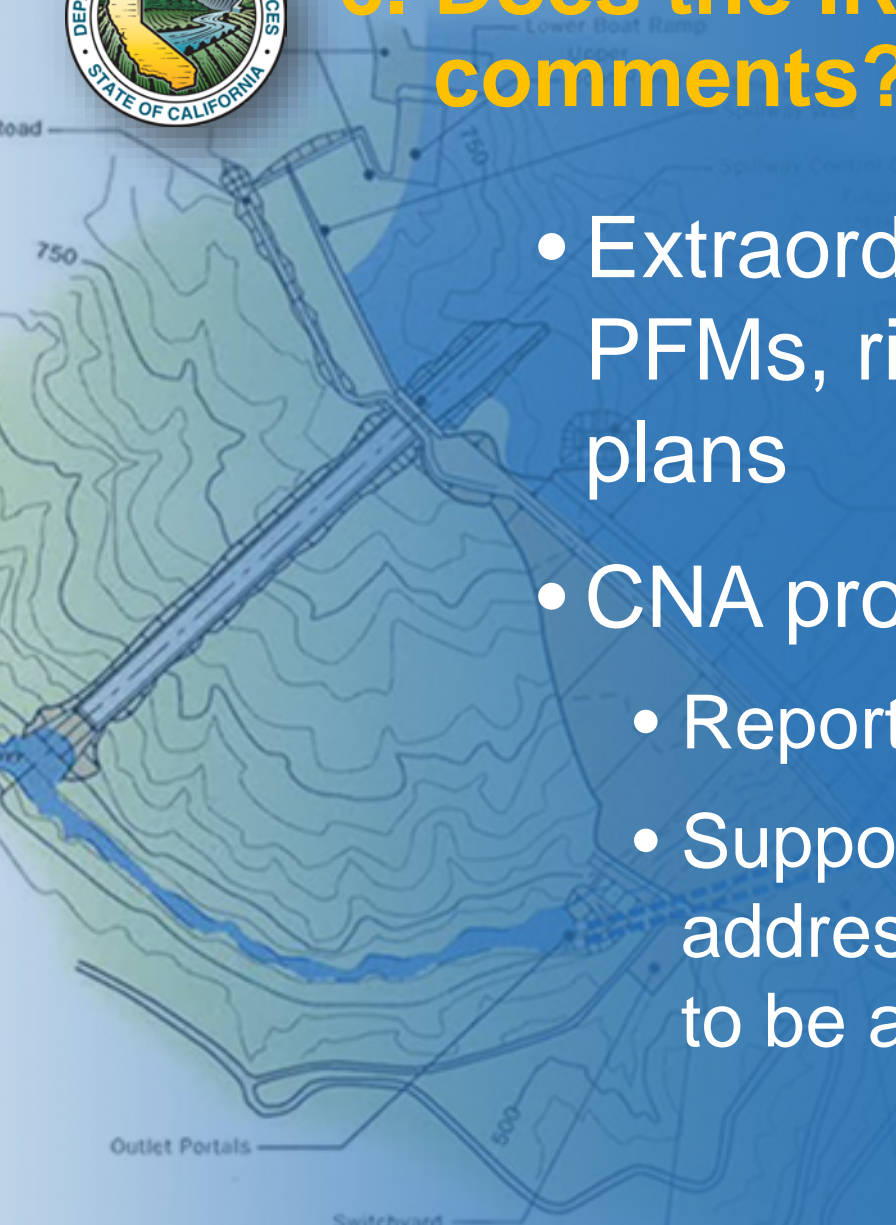
- None

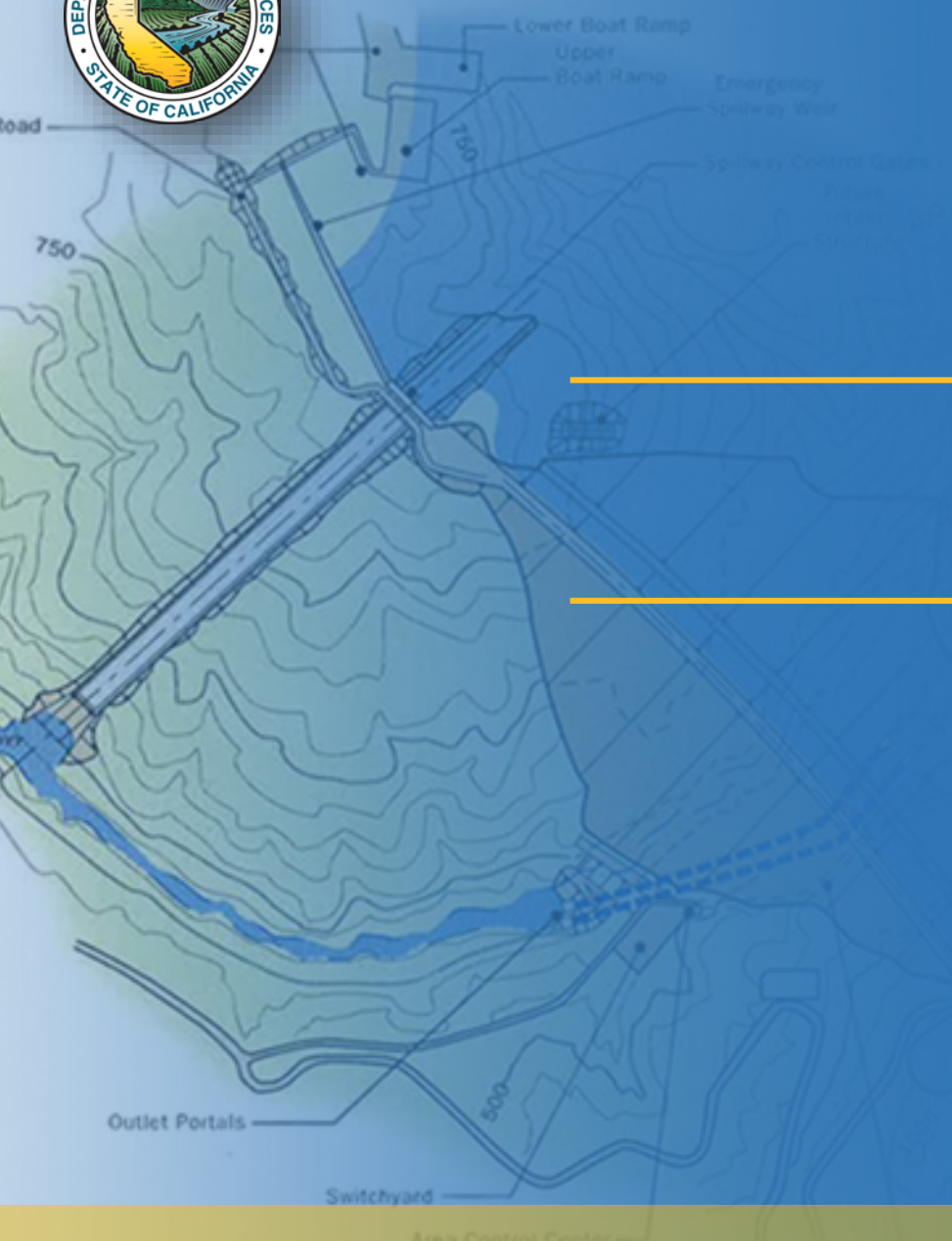




6. Does the IRB have any other recommendations or comments?

- Extraordinary effort to process a large number of PFMs, risk reduction measures, and alternative plans
- CNA provides a model for other facilities
 - Reports provide the framework
 - Supporting studies can be scaled as necessary to address the components of other projects that need to be assessed





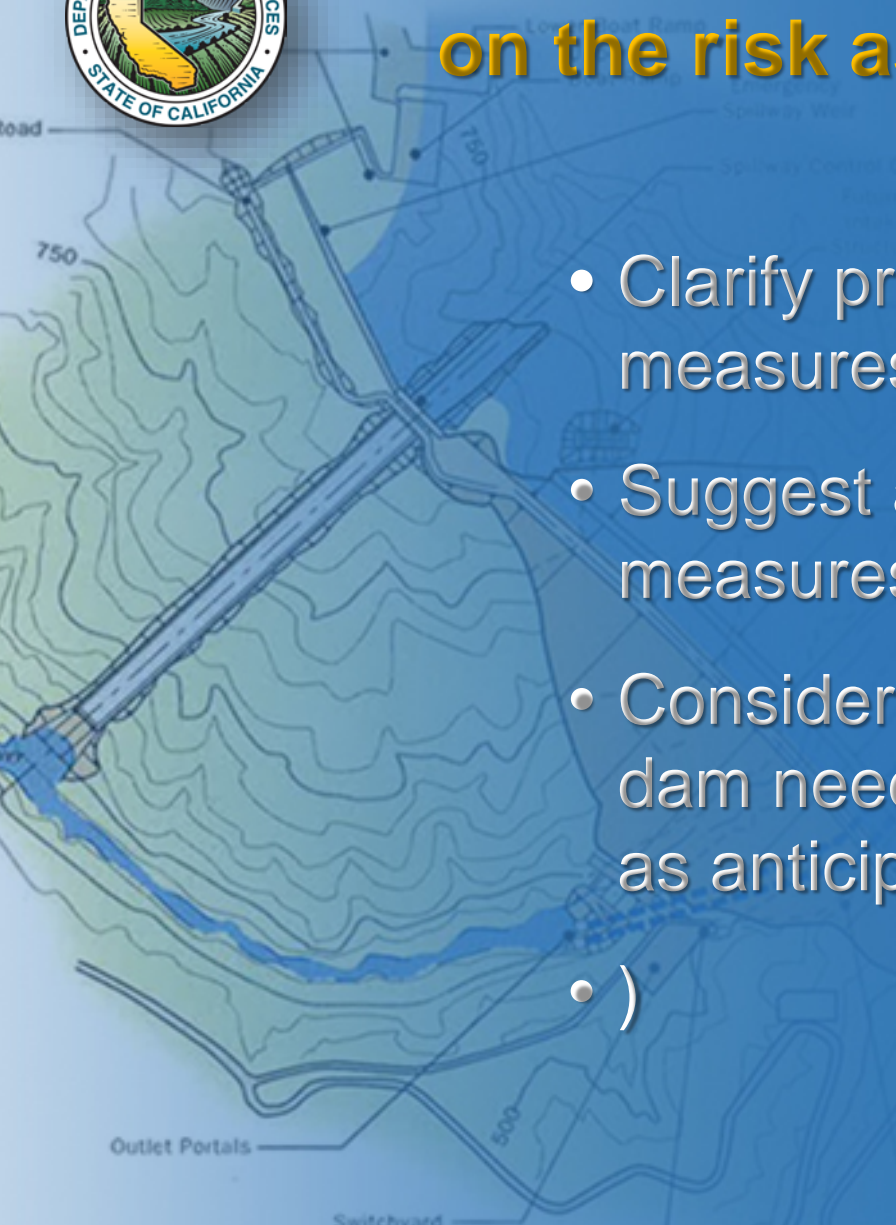
Report #8



1. Does the IRB have any recommendations or comments on the risk assessments or alternative plans?

- Clarify process for eliminating 11 of the 33 recommended measures
- Suggest a plan with just the interim risk reduction measures (Plan 0)
- Consider a measure to raise only those portions of the dam needing to be raised (dam has not settled as much as anticipated)

•)





2. Does the IRB have any recommendations or comments on the CNA project findings and recommendations?

- Suggest using more risk-informed language (leave regulatory language/statements to the FERC Part 12D process)
- Add discussion/finding relative to reservoir evacuation capability
- Reconsider “Finding of no unacceptable risks” in light of the uncertainty that lead to creating risk reduction measures for risk up to 3 orders of magnitude below the threshold of tolerable risk.
- For PFMs highlighted due to financial risks, consider using a simple financial analysis to determine the value of proceeding with risk reduction actions.



3. Does the IRB have any recommendations or comments on the comments log?

- Master comment log was reviewed and updated





4. Does the IRB have any recommendations or comments on the reports?

- CEII Project Report
 - Provide additional context to orient the reader
 - Explain the reasons for different paths for Tasks 2 and 6
 - Explain why results are generally presented for just 2 consequence categories
 - Include some of the key risk summary graphics in the executive summary
 - Enhance Table 2 to indicate the project feature to which a measure applies
 - Revise probability labels in the Asset Management matrix to be mathematically consistent
 - Graphical presentation of comparison of CNA and L2RA risk estimates



5. Does the IRB have any recommendations or comments on the project schedule?

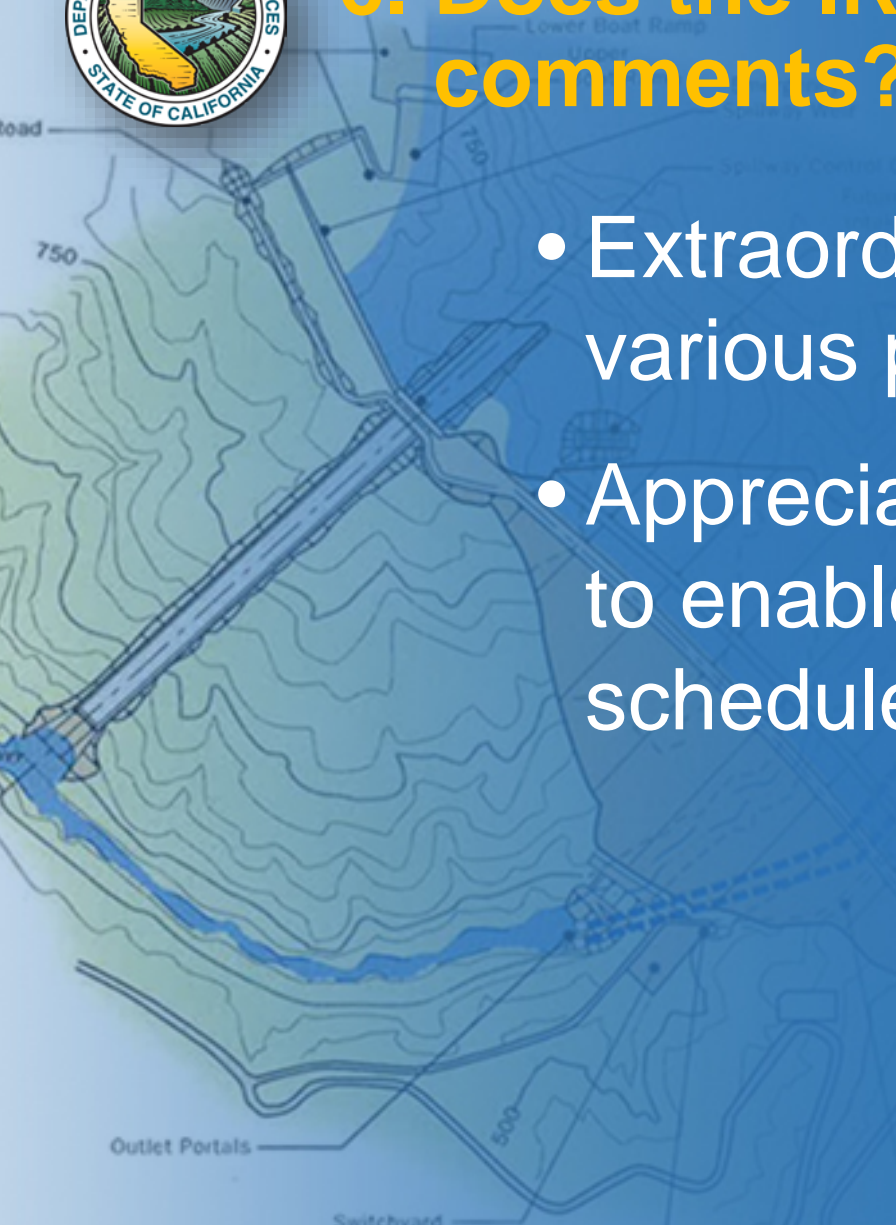
- The assumption that completion of the Task 6 Report will not impact the completion of other reports is significant.

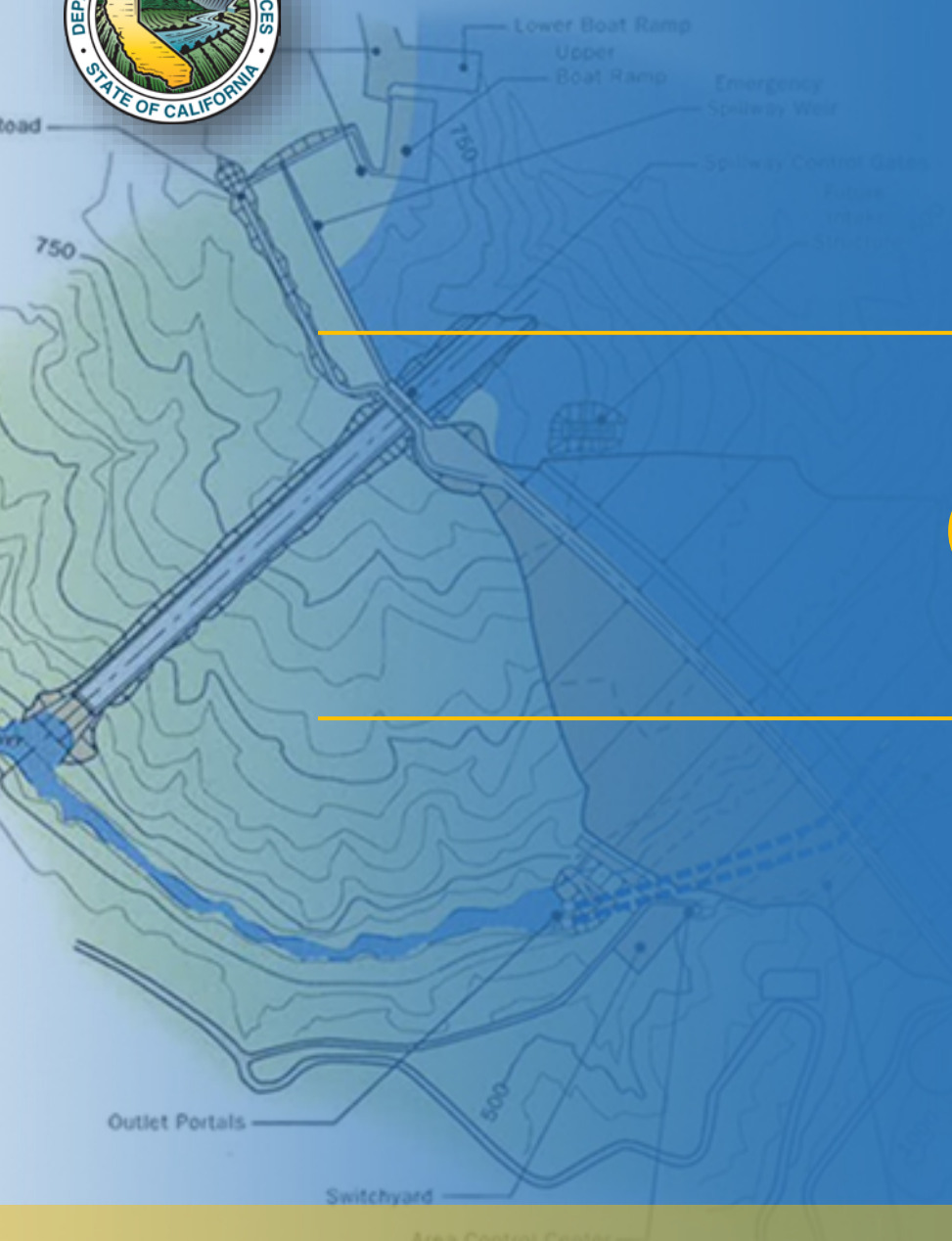




6. Does the IRB have any other recommendations or comments?

- Extraordinary effort has gone into advancing the various project reports
- Appreciate the special effort and accommodation to enable IRB meeting #8 to proceed as scheduled in a virtual format.





Questions?