MEETING SUMMARY
Oroville Dam Citizens Advisory Commission
Meeting 7: May 28, 2021
10:00 a.m. – 12:30 p.m.
Virtual Meeting via Zoom Webinar

This meeting summary provides an overview of the May 28, 2021 Oroville Dam Citizens Advisory Commission (CAC) meeting and focuses primarily on capturing the comments and questions posed by Commissioners and members of the public. It is organized by agenda topic to assist readers in cross-referencing the meeting materials. This document is not intended to serve as minutes of the meeting or a transcript of the discussion. A transcript and materials from the meeting are available on the Oroville Dam CAC website: https://resources.ca.gov/Initiatives/Oroville-Dam-Citizens-Advisory-Commission

MEETING AGENDA

- Welcome and Introductions
- Discuss Commission Action Items, Meeting Roadmap, Report
- Dam Safety Program: Regulatory Perspective
- Dam Safety Program: Public Safety Perspective
- Risk Assessment Presentations
- Status of Spillway Cameras
- Public Input

ACTION ITEMS

- Superintendent Matt Teague will provide information on investments related to fuel and vegetation management.
- DWR will address what constitutes “failure” during subsequent dam safety presentation.
- Risk assessment will be an ongoing topic for the Commission with additional outside experts invited to present.
- Staff asked to create single tracking log for progress.
- Staff asked to add website feature for questions and response.
- DWR asked to address Hyatt Powerplant concerns.

AGENDA ITEM 1: Welcome and Introductions

As mandated by the requirements set forth in Senate Bill 955 (2018, Nielsen), the Commission comprises representatives from the following agencies and public bodies. Attendance at the May 28, 2021 meeting is noted in the table below.

Agency or Public Body	Commissioner (or Alternate)	Present
California Natural Resources Agency	(Chair) Secretary Wade Crowfoot	x
California State Senate	(Vice Chair) Senator Jim Nielsen	x
California State Assembly	Assembly Member James Gallagher	x
Department of Parks and Recreation	Director Armando Quintero (represented by Matt Teague)	x
Department of Water Resources	Director Karla Nemeth	x
California Office of Emergency Services	Director Mark Ghilarducci (represented by Deputy Director Christina Curry)	x
Oroville City Council	Council Member David Pittman	x

Oroville City Council	Mayor Chuck Reynolds	x
Butte County Board of Supervisors	Supervisor Tod Kimmelshue	
Butte County Board of Supervisors	Supervisor Bill Connelly	x
Butte County Board of Supervisors	Genoa Widener	x
Yuba County Board of Supervisors	Supervisor Seth Fuhrer	x
Yuba County Board of Supervisors	Supervisor Andy Vasquez	x
Sutter County Board of Supervisors	Supervisor Mat Conant	
Sutter County Board of Supervisors	Supervisor Dan Flores	x
California Highway Patrol	Sergeant Larry Starkey (represented by Officer Joseph Stokes)	x
Butte County Sheriff's Office	Lieutenant Steve Collins	x
Yuba County Sheriff's Office	Captain Joe Million	x
Sutter County Sheriff's Office	Deputy Andre Licon	x

Secretary Wade Crowfoot welcomed the commissioners, presenters and members of the public to the seventh meeting of the Oroville Dam Citizens Advisory Commission, which is being held virtually in accordance with the State COVID-19 orders. He noted that as the state opens back up, he is confident that the commission will meet in person in Oroville by the end of 2021. The secretary provided an overview of the meeting agenda and structure, as well as the Action Item Tracker that has been established to track actions discussed.

Department of Water Resources Secretary Karla Nemeth provided a drought update and Lake Oroville. She explained that this period represents the driest two years in the Feather Watershed since the mid-1970s and it is dryer in this part of California than it was in 2014-15. Oroville is just below of 50 percent average for May with releases out of Oroville at 1800 cubic feet per second to meet water quality regulations downstream and ensure enough water for fisheries management. The low-flow channel is above 600 cubic feet per second for the salmon and steelhead populations. Feather River Settlement Contractors (rice growers) are receiving 50 percent of their contracted amount due to drought. Water is not being exported to the Central Valley or Southern California. A small amount of water is going to the Bay Area. DWR and the Water Resources Control Board are working together to prepare Oroville's needs for another potentially dry year. Director Nemeth discussed recreation facility (boat launches) impacts as lake levels lower in Oroville. DWR expects Bidwell Canyons to remain open until early July. The department will use the dry conditions as an opportunity to build facilities to allow boat raps to function even during drought.

Superintendent Matt Teague, of the Department of Parks and Recreation, said that the department has worked with boat owners in the marina to remove house boats due to conditions. The boats will be housed in the parking lot areas until conditions improve.

Captain Joe Million asked if due to conditions at Oroville would recreation increase at the area's other lakes, which would mean greater public safety services needed in the surrounding communities and at the lakes.

Superintendent Teague responded that by early July, Lake Oroville's concrete boat ramps will be inoperable. He said his department is assuming greater usage at other reservoirs in the area. There are several primitive facilities accessible via four-wheel drive that are not open to the public.

Assembly Member James Gallagher provided brief remarks, highlighting the upcoming presentation on Risk Assessment. He asked Director Nemeth why Southern California reservoirs are full when the ones in the Northern part of the state are dry.

Director Nemeth explained that the much of the snowpack that typically feeds the area's reservoirs had either seeped into the soil due to very dry soil conditions or evaporated due to warm air temperatures. In April, snowpack was at 70 percent of average, by the end of May it dropped to zero. Southern California reservoirs capture rainfall and that portion of the state was not as low in precipitation this water year. In addition, there are other reservoirs that region uses to store water that was moved there in 2017 and 2018. She explained that in the last two years, they did not meet State Water Contractor supply needs out of Oroville and instead used water stored in San Luis in 2017 and 2018.

Supervisor Bill Connelly expressed concern that the Delta and its fish are being prioritized over local recreation needs. He said he believes there should be more compromise and water reserved for local recreation needs. He also asked if there is any assistance that can be provided to local houseboat owners whose boats are now in storage.

Secretary Crowfoot thanked the Supervisor for his comments on the importance of recreational opportunities at Lake Oroville. He said that per the State Water Project, water must flow to protect the drinking water quality from being fowled with salt water, which provides water to 27 million Californians (two-thirds of the state's residents). He asked Superintendent Teague to respond.

Superintendent Teague said that the department sympathizes with houseboat owners and the private business owner of the marinas. He said that there have been years when boatowners have not had access tot heir boats and during the previous drought, boats were also removed from the lake. The Camp Fire in 2018 and the North Complex Fire and COVID-19 all resulted in park closures, which impacted access. He said that the department is working with the concession owner to set a realistic capacity number to avoid unforeseen conditions.

Supervisor Mat Conant inquired about current inflow into the reservoir.

DWR's John Lehigh explained that there are just under 2,000 cubic feet per second coming into the lake, which is very low for this time of year. In addition, only 20 percent of the snowpack's water content came into the lake this year.

Secretary Crowfoot provided a brief update on the State Budget process and noted some important investments expected in the new budget such as funding for Forecast Informed Reservoir Operations (FIRO). He also highlighted a $200 million allocation for improvements at the Hyatt Powerplant.

Ted Craddock, Deputy Director of the State Water Project, addressed how last year's heatwaves and power outages showed the need for more power generating facilities to assist the grid. The $200 million would be used to make improvements to resume pump storage operations, which had been suspended, to ensure fishery target needs and generate additional energy to support the local and state grids.

AGENDA ITEM 2: Action Items, Meeting Roadmap and Reporting

This discussion was postponed in order to preserve time for the Dam Safety and Risk Assessment presentations and discussions.

AGENDA ITEM 3: Dam Safety Program: Regulatory Perspective

Sharon Tapia, Chief of the Division of Safety of Dams (DSOD), presented an overview of California's dam safety regulation program. DSOD is under the State Water Project. This program's mission is to reduce loss of life and property resulting from dam or related structure failure (outlets, spillways and saddle dams).

This agency has regulatory authority for over 1240 non-federally owned and operated dams (owned by 600 plus different owners). Owners include:

- Water agencies
- Private companies
- Districts
- Individual citizens
- Counties
- Cities
- Associations

There are criteria that determine whether a dam is under state regulatory jurisdiction. Under this guideline, dams that are 25 feet or more in height with 50-acre feet or more storage capacity, fall under State jurisdiction.

Tapia gave an overview of the origin of California's Dam Safety Program, which the State created in 1929, a year after the failure of the Saint Francis Dam. She discussed recent dam safety initiatives and legislation, including:

- Governor's 4-point plan to bolster dam safety and flood protection.
- AB 1270 (2018), which addresses inspection frequencies and requirements and independent review of DSOD dam safety protocols.
- SB 92 (2017), which addresses hazard potential classification, inundation maps, emergency action plans, bolstered enforcement and amended annual dam fees.
- AB 2516 (2018), which addresses public reporting of information related to dams with reservoir restrictions.

Classification of dams is done by downstream hazard potential should the dam fail when the reservoir is full. There are three national categories of severity: low, significant and high. California has an additional category: extremely high. Tapia reported that over half of DSOD regulated dams are considered high or extremely high.

Although the department is a State dam regulator and operator, they keep those functions separated, including funding. An independent consulting board is also involved. DSOD executes dam safety with a technical team comprising engineers and engineering geologists. The department has 81 staff. Tapia explained that DSOD also has regulatory authority to supervise maintenance and operations of dams and reservoirs in order to protect loss of life and property. Low hazard dams are inspected every two fiscal years, all others must be inspected each fiscal year. DSOD responds to dam safety incidents and emergencies.

AGENDA ITEM 4: Dam Safety Program: Public Safety Perspective

Dave Sarkisian, Chief of Dam Safety Services within the Division of Operations and Maintenance under the State Water Project, addressed the topic of public safety and dams.

He explained that there are 26 State Water Project dams throughout California, including 10 within the Oroville Field Division. He also covered how prior to 2000, dam safety focused on surveillance and inspections; dam safety assessments; reservoir operations; maintenance, design and construction; emergency action plans; and independent reviews.

Today, State Water Project Dams are under the Director of Safety Review Board. FERC licensed dams (Oroville's Thermalito Complex) is under 12, which occurs every five years. Sarkisian reviewed what happened in 2017-2018 in the aftermath of the Oroville spillway incident. These included:

- Independent forensic team report.
- Owner's dam safety program audit.
- ISO 55000/ASDSO peer review.
- Management reviews/visits with peers.
- Dam safety program maturity matrices.

Identified areas for improvement include:

- Update State Water Project Dam Safety Policy.
- Define top-down structure.
- Increase training and interaction with dam safety organizations.
- Implement cross-divisional dam safety teams.
- Link SWP Dam Safety Program to Operations and Maintenance Asset Management Program.
- Improve culture of continuous improvement.

Sarkisian explained that they took the recommendations and created multiyear Dam Safety Program initiatives. This began with 30 total, which became consolidated into 16. Some of the 16 are:

- Solidifying guiding documents.
- Complete State Water Project Dam Safety Program Functional Design implementation.
- Enhance DWR's approach to dam safety risk management.
- Enhance emergency preparedness.
- Identify DSP related core competencies.
- Formalize and expand dam safety program training.
- Enhance industry outreach.
- Develop DSP Management of change program and communication plan.
- Develop more formal dam safety management review.

AGENDA ITEM 5: Risk Assessment Presentations

Dr. Rune Storesund, Executive Director, UC Berkeley's Center for Catastrophic Risk Management, led a discussion on risk assessment. Dr. Storesund served as a member of the Ad Hoc advisory group on the Comprehensive Needs Assessment between 2018 and 2020. On May 10, 2021, he submitted a report to the committee outlining his reflections and recommendations.

He focused his presentation on what he termed the socio-technical system, which is a combination of physical performance risk and human/organizational factors. Safety is the

overarching goal of the work. He cautioned that there is no “silver bullet” and that regulators estimates are hard to confirm as what is realistic.

Dr. Storesund recommends what he calls Performance Insurance, which puts financial accountability on dam owners/operators and their consultants. In his research he found that the insurance and bonding industry rate dams as high risk based on the lack of empirical performance data. They doubt reliability of dam risk assessments.

He also gave a review of 2017 and stated that low-level outlets should be backed up in the event of future failures. He believes that the Ad Hoc Committee wants the Oroville Dam Citizens Advisory Commission to continue its work pushing for risk reduction and create a “foundation of resilience.” He suggested that the Commission:

- Re-engage the IFT and ask them to review the implementation of lessons learned and provide a more concrete definition of “safe.”
- Acknowledge financial accountability associated with performance and identify who will receive payment if they need to be made whole in the aftermath of such an event. Use research, assumption audits, design assumptions, etc. and determine validity for today and future.
- Scrutinize asset management, operations, management methods and procedures.
- Mandate life cycle-based management of all dam assets immediately.

Dr. Storesund believes that what classifies as failure is vague, stressed that it changes over time and provided examples. He thinks there should be multiple cross checks using different assessment methods from different perspectives.

Eric Halpin, of Halpin Consultants, gave a presentation on the state of dam safety programs in the United States. He previously worked for the Army Corps of Engineers where he led the largest dam and living infrastructure program in North America.

He provided a historical overview of well-known dam safety failures in the early 20th Century upon which the traditional dam safety focus is built. This includes:

- Compliance with design standards as measure of safety.
- Inspection or monitoring for performance concerns.
- Safety regulations.

Those standards have caused problems according to Halpin because there is a huge variation in risk, it is based on the wrong priorities and poor understanding of the infrastructure and how it would perform and the fact that one size does not fit all. This led to the creation of the modern dam safety program focus starting in 2000. This includes:

- Understanding how things can fail and the risk associated.
- Risk informed decisions.
- Sharing responsibilities via improved communication.
- Governance: people, processes and policy.

Risk analysis, he explained, is a tool that modern programs use to show how facilities were designed and project how they will perform. Risk is the framework to understand models and methodology. Dams last hundreds of years and in one case, there is one in the International Registry of Dams, that is over 1,000 years old.

Risk-informed view of infrastructure safety includes the following questions:

What are the hazards and how likely are they to occur?

- How will infrastructure perform in the face of those hazards?
- Who and what are in harm's way?
- How susceptible to harm are they?
- How much harm is caused?

He stressed that engineering is a balance between various factors such as safety, prevention of loss of life and economic damage and project benefits. It is impossible to achieve absolute safety. Risk informed safety programs are used on every continent with the North America being a leader with what Halpin called the second largest portfolio in the world.

He talked about the Independent Forensic Team report and that the Oroville spillway incident resulted in a Tri Services Report that came from legislation requiring the Feds to collaborate on an independent peer review of the risk analysis process. Modern dam safety programs in the U.S. rely on two main guiding documents:

- *Best Practices in Dam and Levee Safety Risk Analysis*; and
- *Federal Guidelines for Dam Safety Risk Management*.

The reality, he explained, is that while safety programs manage physical systems and governance and human factors, risk is also created by external system influences and political, environmental, economic and social factors.

Modern dam safety programs address mitigating the effects of human factors in several ways, such as:

- Command control for incident decision making.
- Risk informed safety programs.
- Effective communications and public awareness.
- Training exercises.
- Continuing and periodic evaluations.
- Qualification based roles and responsibilities.

The risk analysis community now has better models to understand extreme events such as seismic, flood, etc. considered one in a million type events. In addition, there is need for more consultants in the risk analysis field.

His presentation concluded with an outline of risk analysis industry challenges:

- Simplification of assumptions about system interactions and human factors are necessary and appropriate.
- Retain governance lessons (safety programs) that have been productive.
- Ask if we cannot afford to implement risk concepts in safety programs.

Secretary Crowfoot recommended that the Commission take up risk assessment and safety at subsequent meetings.

AGENDA ITEM 6: Spillway Cameras

This item will be discussed during OCAC's meeting 8 on August 27, 2021.

AGENDA ITEM 7: Public Comment & Questions

Commissioner Genoa Widener began her comments by emphasizing the fact that the 2017 spillway incident affected trust in the local community. She said that while she is encouraged by what the Department of Dam Safety and Dam Services have implemented since then, she wanted to acknowledge that those were implemented because of the serious dam failure in Oroville. She stated that the public needs to be part of the communication going on with the Dam Safety Industry and stakeholders such as owners, operators and regulators. The Oroville Dam Citizens Advisory Commission is part of this solution.

Widener asked for more clarity on risk assessment and more accuracy in communication to the public about what is being done to ensure the Oroville Dam is safety. She requested clarification from DWR on what constitutes failure. She noted that the materials used to construct the Oroville Dam had a 50-year useful lifespan, and that timeframe has passed. Widener raised the question of the installation of new piezometers, which DWR calls “early implementation.” These Department of Dam Safety recommended this 25 years ago. She gave this as an example of where public trust has been eroded with DWR.

Widener concluded by expressing how there is a difference between living near the dam under the risk and the people who are analyzing that risk and making an assessment. She told the Commission that she has been evacuated twice.

Secretary Crowfoot responded that he believes that rebuilding trust is a journey with more work to be done. He acknowledged the risk she has living under the that dam and how this makes risk different than those who make these assessments or live elsewhere not adjacent to the dam. He said time is needed to understand how the Commission can help rebuild trust and explore the recommendations made by Dr. Storesund and Mr. Halpin.

Council Member David Pittman noted that he was there for the 1997 evacuation and served as a coordinator in that high water event. He said that he wishes this Commission had existed after that event, which would have prepared the community better for more recent events. He thanked Senator Nelisen and Assembly Member Gallagher for establishing the Oroville Dam Citizens Advisory Commission, which serve as leaders going forward. He also emphasized the importance of communication.

Secretary Crowfoot agreed about the importance of communication and that the Commission’s role is to serve as a place where technical issues can be brought forward in a public setting and that will also help policy makers understand what is happening and/or needs to happen.

Supervisor Mat Conant said that the risk assessment presentation brought to light some of the issues that he is considered since the 2017 incident such as the inability to manage such rising water coming down river. This destroyed river habitat, trees, farmers’ operations and fish habitat, none of which has fully recovered yet. He explained that he thinks this could have been handled better and that it showed some fundamental flaws in the design of the spillway. He believes better and more advanced testing could have helped prevent the devastation.

Secretary Crowfoot thanked Supervisor Conant for his comments and acknowledged that this is the only commission he is part of created with a legal requirement to bring all the parties represented on the commission together to have these discussions. This is reflective of the fact of how serious the incident was in 2017.

Supervisor Bill Connelly said he appreciates how well-prepared Secretary Crowfoot is and explained how he represents people who are afraid about the dam. The supervisor noted that

meeting 7 featured two presentations on risk showing that things are in good shape with very low assessed risk and another presentation that provided a different way to examine risk that says the safety of dams should be on par with a nuclear flat top or powerplant. He asked that Dr. Storesund's assessment be considered and implemented, which will make people feel better. He believes the Dam Safety Industry could change as a result. Status quo failed with existing dam safety measures, FERC and DWR's assessment that the spillway was safe. He said that longer-term perspective is needed so that his grandchildren and others who will be here in 100 y ears will be safe.

Secretary Crowfoot stated that he thinks progress has been made and pointed to DWR inviting independent analysis through the IFT. He explained that he takes the two presentations from DWR as not so much a defense of the status quo but an explanation of how the event in 2017 catalyzed some critical changes. The secretary said he agrees that Halprin and Storesund's work should be examined to understand what else the State should be doing. By taking time to digest these, the secretary is saying that it will take time to review and understand their assessments.

Senator Jim Nelisen stressed the importance and value of the Commission's work, which goes back to the Sacramento River Conservation Forum that examined how to manage that river and its complicated problems and interests with citizen involvement. He contrasted this with how state lawmakers work. Senator Neilsen told the Commission that he was delayed for this meeting because he was part of a debate on the Canal Conveyance Capacity Restoration Fund legislation. That conveyance system must also be addressed because of years of deterioration. He discussed the need to replenish groundwater and how that will help with subsidence and drought caused water level declines. He expressed his gratitude for Secretary Crowfoot's leadership and his frustration that seven years ago $2.7 billion was set aside for large surface storage through the State Water Bond. Today there is none and the only thing in process is the Sites Reservoir. The New Water Plan, which was negotiated in 2010, includes provisions that affirm a human right to water. California was the first state to enact a human right to safety and water (2012). The senator said he thought that Dr. Storesund did a magnificent job and that the technical committee brought understanding of where we have been, are today and need to go in the future. He is confident about the future. He concluded by also thanking Director Nemeth.

Dr. Storesund commended the Commission for its work and said that the discussions will help increase trust going forward. He asked that they also discuss expected conditions, the impacts and response at 150,000 CFS as well as at 200,000, 300,000 and 400,000. There should be an examination of evacuation zones in those instances.

Public Member (Beth Bello) lives in the Kelly Ridge neighborhood, which is directly adjacent to the Lake Oroville State Recreation Area. She is concerned about fire fuel reduction in the rec area and explained that fire science has changed since the Fuel Reduction Plan was created for the area a decade ago. She asked why more money has not been dedicated for safety and to protect the rec area with fire prevention. She said the area that is most critical is from the parking lot at the south end of the dam up Bidwell Canyon and down the trails to the Visitor Center, Kelly Point and the Bidwell Canyon Marina. She explained that defensible space around homes will not make a difference if a fire is fueled from vegetation adjacent to their homes. She called this a huge timebomb.

Secretary Crowfoot responded by saying that there is a focus on investing more in fuel/vegetation management and that some progress has been made at the state recreation

level. He asked Superintendent Teague to provide her with more information on what is being planned to address this.

Senator Neilsen said that after 40 years of not managing forest and wildlands, money is now being directed to this area. He said that she can call his Chico office to discuss this further and that there is a lot happening that is encouraging. The senator said that wildfire not only puts people and property in harm's way but also wildlife.

Public Member (Matt Mentick) said his intent is to help improve the Commission and thanked Storesund and Halpin. He asked for follow up on several items on the Action Item Tracker including a follow up discussion on the Hyatt Power Plant that was supposed to occur at this meeting. Next meeting is supposed to include a presentation from the State Water Contractors as part of a discussion on asset management. He said that item 12, the Contact Log, is supposed to be a mechanism to submit questions in advance to the presenters and ask follow-up questions. He also requested that these be posted on the website. He wants the next meeting to include FERC Part 12 and 39 recommendations because this will inform how many additional studies are needed to review to quantify the risk and selecting one of the 10 options outlined in the Comprehensive Needs Assessment. He wants to see the internal recommendations for Sarkisian's team to understand what staff is finding instead of just relying on FERC. He wants one comprehensive document that includes those recommendations, FERC, level two, Division of Dam Safety recommendations, the CNA recommendations and the five-year capitalization plan, and encapsulate all the work that needs to be done so the public is more informed. He suggested it could be called the Recommendation Log of Regulatory Requirements and that a document with timeline, schedule and recommendations was recommended by the independent councils. Also, the Commission Charter says that people can ask for relevant information on timelines, schedules and maintenance. He says the information has been gathered in the divisions run by Sarkisian and Craddock and it now needs to be transformed into a public version. He stressed that this work is about building and improving trust, which has been a problem given the eight years wait for Probable Maximum Flood Study that was acceptable by FERC, the 12 years wait for piezometers, a 16 year wait for a hillside emergency spillway geology report and a 40 year wait for a Water Control Manual.

Public Member (Ron Stark) served on the Ad Hoc Committee. He called this the tail of two capitals (Washington, D.C. and Bakersfield, the Western U.S. capital of country music). He thanked Halpin and the U.S. Army Corps of Engineers for their work on Isabella Dam at a cost of $500 million to address issues including the fact that spillways did not meet probable maximum standard. He commented that the Bureau of Reclamation is working on a $1 billion Folsom Dam reconstruction because it would not meet the new probable maximum flood. He contrasted with DWR's approach with Oroville, referring to a letter from FERC on the 140,000 CFS ga between spillway competency and capacity. He said he is disappointed that DWR sees this as a discretionary action when it is a FERC standard. He requested that he be given an opportunity to re-brief DWR and brief Secretary Crowfoot on this issue.

AGENDA ITEM 8: Adjournment

Secretary Crowfoot said that meeting 8, which will be held August 27, 2021, will begin with an update of the Action Item Log. Also, there will be an update on the spillway cameras. He stated that DWR is working to keep cameras operating there given public interest and while these are temporary, they are working to have continued real time footage.

Senator Nelisen thanked the commission for its productive work.

Secretary Crowfoot adjourned the meeting at 12:32 p.m.