

# Nevada Irrigation District

## 2018 Dam Safety Activities Report

Nevada Irrigation District (NID) owns and operates 15 dams under the jurisdiction of California Division of Safety of Dams (DSOD). All of these dams, except two, are also under the jurisdiction of Federal Energy Regulatory Commission (FERC). These two regulatory agencies enforce their respective comprehensive dam safety programs on their jurisdictional dams. The Hydroelectric Department is the District's lead in ensuring safety of the dams, with support from the Engineering, Water Operations, and Water Maintenance Departments. In addition to satisfying the regulatory requirements, the Hydroelectric Department has its own on-going improvements of various dam-safety related facilities and ancillaries. The following summarizes the dam safety activities performed in 2018 by the District:

### 1. Inspections and Monitoring

In additional to the District's weekly (as conditions permit) and monthly inspections of the dams, DSOD and FERC performed their annual inspections in September 2018. (Note: The upper-division dams are inspected approximately monthly from a helicopter when the dams are covered in snow and the access roads are not passable by a regular vehicle.) The District prepared and submitted annual Dam Safety Surveillance Monitoring Reports to FERC and to DSOD.

### 2. Evaluations and Assessments

- a. In 2017 the Scotts Flat Spillway (built in 1940s) was found to not meet modern design standards. Extensive exploration was performed in 2018 to fully characterize the subsurface conditions of the spillway and the surrounding geology. The results of the exploration will be critical information for the planned spillway upgrade design scheduled to start in 2019.
- b. A blanket review of the seismic stability of the eleven jurisdictional embankment dams using the most up-to-date seismic ground motions was conducted in 2018. It was preliminarily found that Loma Rica Dam lacks necessary information regarding the foundation materials. An exploration and field testing are needed to determine the liquefaction potential and material strength in the foundation of the dam. A contract to complete the study was executed in December of 2018. Results of the study are expected during the second quarter of 2019.
- c. A blanket hydrologic and hydraulic study was performed on eleven of the jurisdictional dam reservoirs to update the probably maximum precipitations (PMPs) and the probable maximum floods (PMFs). Updated inundation maps were also generated to meet the new DSOD requirements for emergency action plans (EAPs). In addition, various FERC-required hydraulic analyses were performed and the spillway flow capacities were re-analyzed to update the rating tables.
- d. A seismic stability review of Combie Dam was begun in 2018. Any instability issues identified during the study will be resolved along with the DSOD-required scour protection

against PMF at the left and right abutment groins. The results of the review will be available in early 2019, followed by the scour-protection design.

- e. To satisfy a new FERC requirement, the District engaged with two highly experienced independent consultants specialized in dam safety engineering and practices to audit the District's Owner's Dam Safety Program. The dam safety audit report will be available in 2019.

### 3. Emergency Action Plans (EAPs) and Exercise

EAPs are created as a means to provide emergency notification to the public in the event of a potential dam failure or other abnormal high flow event. To meet the new EAP requirements from DSOD and the California Office of Emergency Services, the District is completing preparation of the updated inundation maps, which need to be approved before updating the EAPs.

A FERC-mandated tabletop and functional exercise (required once every 5 years) was performed at the District Grass Valley Headquarter on September 19, 2018 with a total of 34 attendants from FERC, local authorities, and other entities involved in evacuation in the unlikely event of a breach of a District dam. The District updated and submitted the 2018 EAP status report to FERC for approval.

### 4. Dam Safety Training

The annual dam safety inspection training was conducted on December 19, 2018. Thirty-two District staff members involved in the inspection and safety of District dams attended. In addition to conventional dam safety topics, the training also covered various regulatory compliance issues, application of aerial drone inspections, and the basics of the District's Hydro tele-communications system.

### 5. Other Improvements and Activities

In 2018, the District -

- a. Improved the newly installed 12" fish flow valves and manifolds by widening and deepening the anchors and by modifying the mechanical components.
- b. Drained the lower plunge pool of Scotts Flat Spillway for visual inspection and survey.
- c. Repaired the spalls and damaged joints at the spillways of Dutch Flat Forebay, Dutch Flat Afterbay, Jackson Meadows, and Scotts Flat.
- d. Performed extensive exploration of Scotts Flat Spillway and the surrounding geology with a total of 13 test borings, a total of 747 feet of drilled length, and 2 standpipe piezometers for observation of the groundwater levels outside the spillway chute.
- e. Continued to design the electrical components and anchors of the 60" fixed-cone valve for replacement of the low level outlet valve at Rollins. The replacement construction is scheduled for late 2019.
- f. Performed the 10-year lift-off tests for the 16 post-tensioned anchors stabilizing the gravity sections of Combie Dam. Three of the 16 were shimmed to tensioned the slightly relaxed tendons of the anchors.
- g. Fully cycled the drain valves of all of the dams and reservoirs, with the exception of three that DSOD requested be deferred until 2019 so they could be observed in person.

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- h. Installed a new drain valve operating stem at Milton to replace the one that was likely damaged by wood log debris.
- i. Performed aerial drone mapping of the Bowman North and Bowman South Dams. Received and archived the results for future comparison of any change.

6. Summary of Significant (>\$100,000) Modifications to Dams Completed in 2018

Dam	Component	Year Constructed	Summary of Work
Combie	South penstock intake trash rack	1985	Replace the severely corroded trash rack and the raking system including modification of the support footings and installation of operational controls.