

STATE OF CALIFORNIA
CALIFORNIA NATURAL RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
DIVISION OF SAFETY OF DAMS

INSPECTION OF DAM AND RESERVOIR IN CERTIFIED STATUS

Name of Dam San Joaquin Reservoir Dam No. 1029 County Orange
 Type of Dam Earth Type of Spillway Drop Inlet
 Water is 1.3 feet below spillway crest and 6.8 feet below dam crest.
 Water Surface Elevation EI. 469.2'
 Weather Conditions Sunny
 Contacts Made Danielle Drake and Bill Wesson with IRWD
 Reason for Inspection Periodic Maintenance Inspection

Important Observations, Recommendations or Actions Taken

- The owner needs to continue the following as ongoing maintenance items:
 - Backfill and compact erosion rills as they appear.
 - Maintain the pneumatic piezometers to ensure accurate readings.
- For future instrumentation reports, the owner needs to complete the following:
 - Rain data needs to be incorporated into the piezometer data plots.
 - Ensure that the field data and the report data match in regard to the Floor seepage point.
- The owner will need to fully cycle all valves during the next maintenance inspection.

Conclusion

From the known information and visual inspection, the dam, reservoir, and the appurtenances are judged safe for the continued use.

Observations and Comments

<u>Dam</u>	The crest appeared level and well-aligned. Overall, the asphalt-lined upstream slope, and the earthen downstream slope appeared uniform, stable, and in satisfactory condition. There is some minor erosion on one of the benches on the downstream slope. The owner needs to backfill and compact erosion rills as they appear as an ongoing maintenance item. The groins, downstream toe, and abutments appeared satisfactory with no signs of instability or distress. The vegetation is well managed with periodic vegetation control from the owner. The rodent control is satisfactory with no signs of rodent activity.
<u>Spillway</u>	The spillway approaches and entrances of both drop inlets were clear of debris. The concrete elements of the drop inlets appeared to be in satisfactory condition. The exit of the spillway was clear and unobstructed.
<u>Outlet</u>	The outlet consists of 5 upstream butterfly valves and 2 downstream butterfly valves. All valves were fully cycled in DSOD's presence on October 19, 2020, besides one of the upstream butterfly valves. The 48-inch upstream butterfly valve at elevation 443 feet was inoperable and remains unchanged during this inspection. The owner plans to repair the valve by the end of 2023. The owner last fully cycled the operable valves on May 25, 2022. The owner will need to fully cycle all valves during the next maintenance inspection.
<u>Seepage</u>	There were wet spots along the benches of the dam that appeared to be seepage. Mr. Wesson stated that the wet spots were only due to recent rainfall. This dam has 8 seepage points that are reported in the annual instrumentation report.

Photos taken? Yes No
 cc for Owner/Book

Inspected by Tyler Clark TGC 8/3/2023
 Date of Inspection 4/18/2023 CML 8/3/2023
 Date of Report 7/10/2023

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The seepage points had the approximate flows:

East	36.54 GPM	Floor	11.12 GPM
West	35.38 GPM	U/S Collector 1	Dry
Filter	8.68 GPM	U/S Collector 2	Dripping
Toe	3.43 GPM	06/16/08 Flowpoint	2.06 GPM

All flows appeared clear and within historical ranges for this reservoir, except for the Floor seepage point reading (see Instr. section below for details).

Instr.

The instrumentation at the dam consists of 36 (3 destroyed) survey monuments, 34 piezometers, 8 monitoring wells, and 8 seepage points. The latest instrumentation data report, prepared by GEI Consultants on behalf of IRWD, for this dam was transmitted to DSOD on May 31, 2023, and includes updated data for the monitoring period from January 1, 2022, through December 31, 2022.

Survey Monuments: The vertical and horizontal displacements show negligible changes during this monitoring period. The max vertical displacement is less than 0.04 feet, and the max horizontal displacement is less than 0.05 feet since September 2006. There appears to be no concerning trends or conditions in the data.

Piezometers: The 8 monitoring wells and 6 standpipe piezometers are not within the dam embankment or any jurisdictional appurtenances but are reported in the annual instrumentation report. These instruments show negligible movement and do not appear to respond to reservoir level.

The remaining 28 piezometers are within the dam. The 8 vibrating piezometers are set in the upstream side of the dam embankment. The data from these piezometers are not reading correctly and, per GEI, are still being repaired by the owner. There was no data reported for the 8 vibrating piezometers during this monitoring period.

The remaining 20 of the 28 piezometers are pneumatic. Overall, the pneumatic piezometers appear to be operating within historical limits with no concerning trends. Piezometers C-4, C-6, C-8, LR-4, RR-2, LR-3, LA-1, LA-2, RA-1, RA-2, and RA-3 generally correlate with the reservoir level fluctuations. The remaining piezometers show negligible movement and do not correlate with the reservoir level fluctuations. GEI has reported that some of the pneumatic piezometers are reading below the tip elevations or have zero readings. During GEI's inspection of these piezometers, it was reported that the control and relief valves at the pneumatic piezometer vault box were inoperable. The owner needs to maintain the pneumatic piezometers as an ongoing maintenance item to ensure accurate readings.

For future reports, the owner needs to add rain data into the piezometer data plots.

Seepage: There are 8 seepage points at this dam. Overall, the seepage levels at this dam have remained consistent and are within historical ranges. The east and west seepage track the reservoir level fluctuations. The U/S collectors 1 and 2 are historical dry, except when the reservoir is at a higher reservoir elevation the drains flow less than 1 GPM. The filter seepage ranges from approximately 4-9 GPM and the toe drain seepage ranges from 1-4 GPM. The toe drain seepage point had one spike of 8 GPM but returned within historical range after the spike. The right groin seepage points (also referred to as 06/16/08 flowpoint) is typically below 1 GPM.

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The floor seepage ranges from approximately 1 GPM to 5.5 GPM shown in instrumentation report. However, in the inspection conducted on June 13, 2022, it was reported that the floor seepage point showed 11.5 GPM. Also, during this maintenance inspection on April 18, 2023, it showed that the floor seepage point was reading 11.12 GPM (Photo 1). There is a discrepancy in the data reported from the DSOD field inspections and the annual instrumentation report submitted by the owner. The owner needs to investigate this discrepancy and ensure that the field data matches the data reported.

The instrumentation data shows the dam is performing satisfactorily and no new instrumentation is needed at this time.

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Photo 1: View of the floor drain seepage showing 11.12 GPM.

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Photo 2: View of the erosion rill on one of the downstream benches.

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Photo 3: View of the seepage and rain collected at the toe of the dam.



Photo 4: View of the upstream slope.