

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 Two drop inlets
 Water is 5.9 feet below spillway crest and 11.4 feet below dam crest.
 Weather Conditions Overcast
 Contacts Made Nang Mwe, Steve Habiger, and Christian Wimenta with IRWD
 Reason for Inspection Periodic Maintenance Inspection

Important Observations, Recommendations or Actions Taken

<i>Select if needed:</i>		<i>Descriptions, actions, and recommendations:</i>
☒	Maintenance items required.	Valves 2 and 5 leak hydraulic fluid when operating the valves and are fixed in a full-open position. IRWD has kept DSOD apprised of the progress of repairs to the valves and is expecting to install new actuators on all 5 upstream valves by the end of 2025. Continue to keep DSOD updated on the progress of the actuator installations. Arrangements need to be made to fully cycle all upstream slide gates after the actuators are replaced.
☒	Outlet/spillway valves/gates need to be fully cycled during the next DSOD inspection.	
☐	Instrumentation submittal overdue.	
☐	Open construction, alteration, enlargement, repair, or removal application.	
☐	No Action Items/Recommendations.	
☐	Other.	

Conclusions

Hazard Classification:

☒ Extremely High ☐ High ☐ Significant ☐ Low

Condition Assessment:

☒ Satisfactory ☐ Fair ☐ Poor ☐ Unsatisfactory

Reservoir Restriction:

☐ Yes ☒ No

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

Photos taken? ☒ Yes ☐ No

Inspected by C.M. Lancaster *CML* 6/23/2025

Date of Inspection 5/7/25

Date of Report 6/17/25

BC 6/23/2025

INSPECTION OF DAM AND RESERVOIR IN CERTIFIED STATUSName of Dam San Joaquin ReservoirDam No. 1029Date of Inspection 5/7/25

Observations and Comments		
<u>Dam</u>	<i>Dam Description:</i> The dam consists of a zoned earthen embankment with an asphalt-lined crest, asphalt-lined upstream slope, and riprap-lined downstream slope.	
	<i>Dam crest in satisfactory condition:</i> ☒ Yes ☐ No <i>Maintenance needed:</i> None.	
	<i>Upstream/downstream slopes, abutments, and toe areas uniform, stable, and in satisfactory condition:</i> ☒ Yes ☐ No <i>Maintenance needed:</i> Some repairs were completed to spalls and cracks in the upstream asphalt liner since the last inspection. The repairs appeared to be holding up well.	
	<i>Vegetation control satisfactory:</i> ☒ Yes ☐ No <i>Maintenance needed:</i> As requested, vegetation was removed from the downstream left groin since the last inspection.	
	<i>Rodent control satisfactory:</i> ☒ Yes ☐ No <i>Maintenance needed:</i> None.	
	<i>Dam comments:</i> IRWD plans to make surface drainage improvements on the benches of the downstream slope of the dam, which includes grading, placing concrete v-ditches, and reestablishing survey monuments. IRWD will send DSOD 90-percent plans for review and to ensure the work will not require an application.	
	<u>Spillway</u>	<i>Spillway Description:</i> The spillway consists of two 6.5-foot by 6.5-foot concrete drop inlet boxes, one near each end of the upstream face of the dam. Each drop inlet then conveys water through 48-inch RCP pipes that run outside of the embankment and outfall at the concrete terminal structure downstream of the dam toe.
<i>Log boom in place and intact:</i> ☒ N/A ☐ Yes ☐ No		
<i>Spillway approach area, control section, and downstream exit clear:</i> ☒ Yes ☐ No <i>Maintenance needed:</i> None.		
<i>Spillway condition satisfactory:</i> ☒ Yes ☐ No <i>Maintenance needed:</i> None.		
<i>Spillway comments:</i> The spalled concrete in the invert of the left spillway pipe was repaired since the last inspection.		

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Date of Inspection 5/7/25

Observations and Comments

Outlet

Outlet Type/Description: The low-level outlet consists of a 60-inch steel inlet/outlet pipe encased in reinforced concrete through the embankment. The upstream end of the outlet is controlled by 5 butterfly valves (BFV) on an inclined intake structure at different elevations. There is one 60-inch BFV, one 24-inch BFV, and three 48-inch BFVs.

The downstream end of the pipe tees off through an 18-inch line that blows off into the 48-inch storm drain pipe. There are two 18-inch BFVs that control the blowoff.

Outlet Control: ☒ Yes ☐ No

Last Cycled (DSOD Presence):
See below

(Independently by Owner):
See below

Outlet Control	Last Fully Cycled In DSOD's Presence	Last Fully Cycled By The Owner
48-inch BFV (Valve 1)	3/25/24	3/25/24
48-inch BFV (Valve 2)	1/14/20	10/26/23
48-inch BFV (Valve 3)	3/25/24	3/25/24
24-inch BFV (Valve 4)	3/25/24	3/25/24
60-inch BFV (Valve 5)	10/19/20	10/26/23
18-inch BFV Blowoff	3/25/24	3/25/24
18-inch BFV Blowoff	3/25/24	3/25/24

Comments: IRWD was reminded that, per the California Water Code, dam owners are required to fully cycle all outlet controls annually and in DSOD's presence every three years.

Overall outlet condition satisfactory: ☐ Yes ☒ No

Outlet visually unobstructed: ☒ Yes ☐ No

Maintenance needed: Restore Valve 2 and Valve 5 to a fully operable condition.

Outlet comments: Valves 2 and 5 leak hydraulic fluid when operating the valves, and therefore, have not been fully cycled since the dates listed above. They are kept in a full-open position. IRWD has kept DSOD apprised of the progress of repairs to the valves. IRWD is expecting to install new actuators on all 5 upstream valves by the end of 2025. Continue to keep DSOD updated on the progress of the actuator installations. Arrangements need to be made to fully cycle all upstream slide gates after the actuators are replaced.

Instrumented seepage monitoring at the dam: ☒ Yes ☐ No

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Observations and Comments

Seepage

Description and measurements: There are 8 seepage monitoring points at the dam. The following seepage readings/estimates were taken during the inspection:

Seepage Point	Flow (gpm)	Seepage Point	Flow (gpm)
East	38.9	Floor	3.92
West	36.1	U/S Collector 1	Dry
Filter	8.1	U/S Collector 2	0.15
Toe	2.0	6/16/08 Flowpoint	0.6

Seepage observations and comments: There was no seepage observed on the downstream slope, groins, or toe of the dam.

Sediment is collected and weighed throughout the year from the East and West Drains which have V-notch weir boxes within the blowoff vault structure downstream of the toe. The West Drain continues to transport sediment while the East Drain has not for over 10 years. Reportedly, because the West Drain is encased in concrete through the embankment and based on the hydrometer analysis of the sediment, it is unlikely that the sediment is coming from the dam embankment. The owner continues to monitor this situation and notify DSOD upon any concerning changes in condition.

A new seepage return line was installed and activated since the last inspection, leaving the seepage vault for the Toe and Floor Drains empty during the inspection (Photo 5).

Seepage conditions are consistent with past inspection observations: ☒ Yes ☐ No

Maintenance needed: None.

Instr.

Dam instrumented: ☒ Yes ☐ No Submittal required: ☒ Yes ☐ No

Submittal frequency: Annually Overdue: ☐ Yes ☒ No

Latest instrumentation submittal: 5/19/25 Reporting period: CY 2024

Dam instrumentation: Instrumentation at the dam consists of 36 survey monuments (3 destroyed), 34 piezometers, 8 monitoring wells, and 8 seepage points.

Instrumentation at the dam is judged adequate at this time: ☒ Yes ☐ No

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Instrumentation review:

Survey Monuments: The survey monuments are located along the crest, downstream benches, and upstream benches of the dam. The most recent survey was completed on June 1, 2024, and the report includes survey data from 2006 to 2024. The survey monuments have shown only slight horizontal movements and little to no vertical movement over the last 18 years. Movements since the last survey are negligible. No concerning trends or conditions were observed in the data.

Piezometers: There are 6 standpipe piezometers located around the reservoir in locations that would not monitor conditions within the dam, therefore they will not be reviewed in this instrumentation review.

There are 8 vibrating wire piezometers that are located on the upstream slope. Between 2019 and 2023, the piezometers provided erratic data, which was assumed to be caused by the data logger. In 2023, maintenance was completed which appeared to have corrected the issue, except for VB-1 which reportedly continues to produce erroneous readings. Since 2023, VB-2, VB-4, VB-5, VB-6, and VB-8 appear to track reservoir fluctuations to different degrees, while VB-3 and VB-7 remained relatively unresponsive to reservoir fluctuations and rainfall. These patterns were similar before 2019 as well. No concerning trends or conditions were observed in the data, outside of VB-1 which continues to be monitored.

There are 20 pneumatic piezometers that were installed in 1965 and are located within the dam and abutments. Piezometers C-4, C-6, C-8, RR-2, LR-3, LR-4, LA-1, LA-2, RA-1, RA-2, and RA-3 all appeared to track reservoir fluctuations to differing degrees. The readings appeared to remain within historical ranges, except for C-2, C-8, LR-1, and LR-2 which slightly exceeded or nearly reached a 10-year high reading. These piezometers fell into GEI’s “Level IV” alarm level which corresponds to thresholds developed by GEI and will be closely monitored. Additionally, GEI believes that these pneumatic piezometers may be past their service life. Piezometers C-1, C-2, C-3, C-5, C-7, C-9, LR-1, and LR-2 exhibited little to no correlation to fluctuations in the reservoir or rainfall. As a reminder, if IRWD plans to abandon, replace, or discontinue readings of any dam instrumentation, DSOD must be notified and concur, prior to any further actions are taken.

Monitoring Wells: The 8 monitoring wells are located in the right abutment upstream of the dam to monitor ground water conditions for the subdivision. These well will not be reviewed in this instrumentation review.

Seepage Points: The report includes data from 2014 to 2024. The U/S Collector Drain No. 1 has been dry historically and remained dry during the monitoring period. U/S Collector Drain No. 2 has historically read mostly dry and flowed less than 1 gpm during the monitoring period. Seepage appeared to correlate with sustained rises in the reservoir elevation. During the reporting period, the East Drain ranged between 10.33 gpm and 47.90 gpm and the West Drain ranged between 15.95 gpm and 40.65 gpm. The East and West Drains continued to closely track fluctuations in the reservoir elevation. The Filter Drain appears to have an attenuated response to fluctuations in the reservoir elevation and ranged between 7.98 gpm and 10.72 gpm during the monitoring period. The Right Groin Drain (6/16/08 Flowpoint) remained under 2 gpm during the monitoring period and continued to be influenced by rainfall events. The Floor Drain and Toe Drain had historically high readings due to the seepage vault flooding after the seepage return line (which drains the vault) was taken offline after multiple failures. The vault has been drained by the new seepage return line during the inspection. The Floor Drain and Toe Drain will continue to be reviewed in upcoming instrumentation reports. No concerning trends or conditions were observed in the seepage data.

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Observations and Comments	
	Instrumentation data indicate the dam is performing satisfactorily: ☒ Yes ☐ No

In accordance with Division 3, Part 1, Chapter 2, section 6029 of the California Water Code, the owner or operator of a dam or reservoir is responsible for the safe operation, performance, and maintenance of their dam or reservoir, and obtaining all necessary permits and approvals from other permitting agencies, as required.



Photo 1. Upstream slope of the dam. Red arrow indicates the right spillway drop inlet.

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Photo 2. Downstream slope of the dam.



Photo 3. Interior of spillway drop inlet.

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Photo 4. Downstream terminal structure for the spillway.



Photo 5. Toe Drain and Floor Drain vault drained by new seepage return line.