

**Annual Surveillance Report
January 2017 through December 2017**

**San Joaquin Dam
DSOD Dam No. 1029-000
Newport Beach, CA
November 26, 2018**



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**ANNUAL SURVEILLANCE REPORT
JANUARY 2017 THROUGH DECEMBER 2017
FOR
SAN JOAQUIN DAM
DSOD DAM NO. 1029-000
NEWPORT BEACH, CALIFORNIA**

Submitted To:

**Irvine Ranch Water District
Field Operations Department
P. O. Box 57000
Irvine, CA 92619-7000**

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Project No. 397C-IRW

November 26, 2018



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Project No. 397C-IRW

Irvine Ranch Water District
Field Operations Department
P. O. Box 57000
Irvine, CA 92619-7000

Attention: Mr. Jeff Smyth, Engineer

Subject: San Joaquin Dam, DSOD Dam No. 1029-000,
Annual Surveillance Report, January 2017 through December 2017

Dear Mr. Smyth:

GENTERRA Consultants, Inc. (GENTERRA) is pleased to submit this Annual Surveillance Report for San Joaquin Dam covering the period from January 2017 through December 2017. This report is part of the scope of work described in our proposal dated October 14, 2015, and as authorized by the Irvine Ranch Water District (District) in Purchase Order No. 527854 dated December 22, 2015.

We appreciate this opportunity to provide the District with our services during this annual surveillance program. Please contact either of the undersigned with any questions.

Sincerely,
GENTERRA CONSULTANTS, INC.

Douglas A. Harriman, P.E.
Principal Engineer
P.E. 55620

Joseph J. Kulikowski, P.E., G.E.
President and Senior Principal Engineer
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Enclosure

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SECTION 1: INTRODUCTION AND BACKGROUND

1.1 GENERAL

This report presents the results of the dam safety monitoring and surveillance program for the San Joaquin Dam, conducted by the Irvine Ranch Water District (District) and GENTERRA Consultants, Inc. (GENTERRA) for the 12-month period from January 2017 through December 2017. It includes a compilation of the field measurements, observations, and conclusions related to the general condition and safety of the dam. In addition, recommendations are provided for continued operation, surveillance, and monitoring of the performance of the dam. This report is being submitted as part of the jurisdictional requirements of the State of California, Department of Water Resources, Division of Safety of Dams (DSOD).

This report includes graphical summaries of the field measurements of water levels in the piezometers and monitoring wells, seepage flows, and dam movement measurements. It also contains tabulated data of the field measurements of water levels in the piezometers and monitoring wells, seepage flow rates, and field survey measurements.

Figure 1 is a plan view of the dam and reservoir with a representative cross section of San Joaquin Dam. Figure 2 is a site plan of the dam and reservoir. As used in this report, the left and right designations are as viewed looking downstream.

The vertical datum indicated on the as-built plans and project documents for San Joaquin Dam and Reservoir is the National Geodetic Vertical Datum of 1929 (NGVD 29). The reservoir water surface elevation and instrumentation data are currently being read based on the vertical datum of North American Vertical Datum of 1988 (NAVD 88). The National Oceanic and Atmospheric Administration (NOAA) National Geodetic Survey (NGS) online program VERTCON, calculated an orthometric height difference (i.e. datum shift) of 2.375 feet that is to be added to elevations in NGVD 29 to obtain elevations in NAVD 88 for the San Joaquin Dam and Reservoir. A list of key features of the dam with elevations in both NGVD 29 and NAVD 88 for reference is shown below.

Feature	Elevation (NGVD 29)	Elevation (NAVD 88)
Dam Crest	476.00 ft	478.38 ft
Spillway Crests	470.50 ft	472.88 ft
Upstream Slope Bench	420.00 ft	422.38 ft
Downstream Slope Benches	420.00 ft	422.38 ft
	360.00 ft	362.38 ft
	300.00 ft	302.38 ft

1.2 DAM AND RESERVOIR

San Joaquin Dam and Reservoir were constructed in 1966 by the Irvine Ranch Water District (District) as a potable water storage facility. The facility was owned by a consortium of nine local

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water agencies including the District and the Metropolitan Water District (MWD). The District was the major owner and MWD was responsible for reservoir operations and dam safety.

The District subsequently acquired complete ownership of the dam and reservoir and converted it from a potable facility to a recycled water facility. The conversion project included the following dam and reservoir improvements:

- Place fill in the canyon to the east of Claystone Hill (referred to as Canyon “C” on Figure 2) to improve the configuration of the reservoir and minimize stagnant water areas.
- Line the reservoir on the eastern side with a geocomposite drain, geomembrane liner, and clay lining. The purpose of the lining is to minimize seepage from the reservoir and to reduce groundwater levels within the reservoir slope to below historical levels.
- Install eight monitoring wells: six wells to monitor groundwater levels on the eastern side of the reservoir; one well to monitor water levels within the Canyon “C” fill; and one well to monitor water levels within the Buttress Fill.
- Install eight vibrating wire piezometers in the upstream face of the dam to monitor pore water pressures within the upstream clay core.
- Repair and reseal the reservoir asphalt concrete surfacing.
- Construct a storm drain system along the east and southeast patrol road.
- Restore the patrol road along the eastern and southern sides of the reservoir.
- Install a domestic water line to the operations building.
- Refurbish the existing intake/outlet valves.
- Install a reservoir aeration system.
- Address miscellaneous items to improve the aesthetics and operational efficiency of the facility.

Construction of the conversion project began in January 2004. Engineering consultation during construction was provided by Berryman & Henigar, GENTERRA, and other firms. Completion of the reservoir improvements was achieved by November 2004. The final DSOD inspection was performed on December 9, 2004. The District began refilling the reservoir on December 27, 2004 and completed the refilling process on March 7, 2005.

San Joaquin Dam is a zoned rockfill embankment dam located in Newport Beach, California. According to DSOD (2000) as well as as-built plans, the dam crest is at an elevation of 476.0 feet

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(NGVD 29), with a crest width of 30 feet. The height of the dam is 224 feet with a crest length of 873 feet. The dam crest is lined with asphalt concrete and has a camber varying from 0 feet at the abutments to 3 feet at the center of the dam crest. The upstream face of the dam is lined with asphalt concrete, has a slope gradient of 3H:1V (Horizontal:Vertical), and a bench at Elevation 420.0 feet (NGVD 29). The downstream face has a slope gradient of 2.25H:1V with three benches at Elevations 420.0 feet, 360.0 feet, and 300.0 feet (NGVD 29). The reservoir has a storage capacity of 3,036 acre-feet.

The reservoir has a drainage area of about 0.3 square miles. Per the document titled “Dams within the Jurisdiction of the State of California” (DSOD, 2000) the reservoir has a storage capacity of 3,036 acre-feet. The reservoir is lined with a compacted impervious earthen material which ties into the impervious upstream zone of the dam.

1.3 SPILLWAY

The spillway consists of two overpour drop inlets, one located near each abutment. The inlets are comprised of a concrete drop structure with the spillway lip at an elevation of 470.5 feet (NGVD 29). Connected at the bottom of each drop structure is an outlet conduit that converges at the energy dissipation box located in the stream channel downstream of the toe of the dam.

1.4 OUTLET WORKS

The outlet works consists of an intake structure, an outlet conduit, and a blowoff structure. The intake structure consists of an inclined 60-inch-diameter mortar-lined, mortar-coated, welded steel pipe located beneath the reservoir slope southeast (right) of the dam. There are four intake valves: one 24-inch butterfly valve at Elevation 370 feet, and three 48-inch-diameter valves at Elevations 380, 415, and 450 feet. A 60-inch-diameter butterfly valve is located at the transition from the 60-inch-diameter steel intake pipe to the outlet conduit near the right upstream toe of the dam. The outlet conduit is a 60-inch-diameter mortar-lined, mortar-coated, welded steel pipe that extends through the dam to a concrete blowoff structure near the downstream toe of the dam and continues for about 100 feet to the Control Building. The blowoff structure consists of two 12-inch-diameter emergency blowoff valves located in-line to minimize the release of water when exercised. Water released from the blowoff valves drains into the east storm drain conduit.

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SECTION 2: FIELD MEASUREMENTS

2.1 RESERVOIR WATER LEVELS

The District completed the reservoir refilling process on March 7, 2005. The reservoir is considered full when its water surface is at an elevation of approximately 470.0 feet (NGVD 29). The crest of the dam is at Elevation 476.0 feet (NGVD 29) or 478.38 feet (NAVD 88), and the crest elevation of each of the two spillway inlets is at 470.5 feet (NGVD 29) or 472.88 feet (NAVD 88). An annual cycle of seasonal lowering of the reservoir during the spring and summer, and then refilling during the winter is the typical pattern of District operation at this reservoir.

The elevation of the water surface in the reservoir is usually recorded monthly, each time a field visit is made to collect instrumentation data. During this 12-month review period, the elevation of the water surface in the reservoir ranged from 395.0 feet (NAVD 88) to 472.1 feet (NAVD 88).

2.2 INSTRUMENTATION

Several types of instrumentation are being monitored at the dam and reservoir, including vibrating wire piezometers, pneumatic piezometers, open-well piezometers/monitoring wells, seepage monitoring stations, and survey monuments. All measurements and readings were made by District personnel. The following is a brief summary of the instrumentation at San Joaquin Dam and Reservoir:

1. Eight vibrating wire piezometers, identified as VB-1 through VB-8, were installed in 2004. The locations of these piezometers are shown on Figure 3. Readings are taken at the control panel on the upstream side of the dam crest.
2. Twenty pneumatic piezometers were installed in 1965. These pneumatic piezometers are located in the dam embankment and abutments. They are grouped into sets of piezometers, identified as the C, LA, LR, RA, and RR series. Their locations are shown on Figure 3.
3. Six open-well piezometers, identified as CP-1A and -1B, CP-2A and -2B, and CP-3A and -3B, were installed in 1977. The locations of the piezometers are shown on Figure 4.
4. Eight monitoring wells, identified as MW-1 through MW-8, were installed around the perimeter of the reservoir in 2004. The locations of these wells are shown on Figures 4 and 5.
5. Flow rates are obtained at eight seepage monitoring stations. The flow points, which consist of V-notch weirs, are located as shown on Figure 2. They are identified as the East Drain, West Drain, Filter Drain, Upstream Collector Drain No. 1, Upstream Collector Drain No. 2, Downstream Toe Drain, and Floor Drain. An eighth seepage monitoring location has been added at the outlet of the right groin drain pipe.

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6. There were originally 36 survey monuments installed at the dam in 2004 as part of the reservoir conversion project. The original survey monuments are grouped into sets, identified as the SA, SB, SC, SD, SE, and SF sets. The SF series monuments are located along the upstream toe of the dam and there is no data available for this series because they are submerged under the water. The SE series monuments are located inside the reservoir and cannot be surveyed while the water surface elevation is above 422.0 feet (NAVD 88). SA-4, SE-1, and SE-4 are no longer being surveyed because they were destroyed. Because eight of the 33 active monuments are usually under water, there are currently 25 survey monuments being surveyed by the District typically on an annual basis. The locations of the survey monuments are shown on Figure 6.

2.3 PIEZOMETER AND MONITORING WELLS

Tabulated data for piezometer and monitoring well measurements are presented in Table 1 for the 10-year historical period from January 2008 through December 2017. Table 2 presents the vibrating water piezometer measurements for the 10-year historical period from January 2008 through December 2017. Table 3 contains the pneumatic piezometer measurements for the 10-year historical period from January 2008 through December 2017.

Figures 7A through 7E present graphs of measured water levels in the reservoir, piezometers, and monitoring wells during the 2-year period from January 2016 through December 2017. Figures 8A through 8E present graphs of measured water levels in the reservoir, piezometers, and monitoring wells for the 10-year historical period from January 2008 through December 2017.

Figures 9A and 9B are graphs of water levels based on the readings obtained from the vibrating wire piezometers during the 2-year period from January 2016 through December 2017. Figures 10A and 10B are graphs of water levels based on the readings obtained from the vibrating wire piezometers for the 10-year historical period from January 2008 through December 2017.

Figures 11A through 11D present graphs of water levels based on the readings obtained from the pneumatic piezometers during the 2-year period from January 2016 through December 2017. Figures 12A through 12D present graphs of water levels based on the readings obtained from the pneumatic piezometers for the 10-year historical period from January 2008 through December 2017.

2.3.1 OPEN-WELL PIEZOMETERS (CP-1A/CP-1B THROUGH CP-3A/CP-3B)

Data from the open-well piezometers, labeled as CP-1A and CP-1B, CP-2A and CP-2B, and CP-3A and CP-3B, are collected monthly by the District. Table 1 presents the water-level data collected from these piezometers over the 10-year historical period from January 2008 through December 2017. Figures 7A and 8A show graphs of the water levels in Piezometers CP-1A, CP-1B, CP-3A, and CP-3B. Similarly, Figures 7B and 8B presents graphs for Piezometers CP-2A and CP-2B.

Water levels in Piezometers CP-1A and CP-1B have remained fairly constant throughout the 12-month review period. Piezometer CP-1A showed a slight response to reservoir water level

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fluctuations, while Piezometer CP-1B showed little to no response. Piezometers CP-2A and CP-2B appear to fluctuate seasonally due to typical rainfall during the cooler months, and during the drier months due to infiltration of irrigation water that is applied to the landscaping at residential properties located on the nearby hillside at higher elevations. CP-3A and CP-3B have remained fairly consistent throughout the 12-month review period.

2.3.2 MONITORING WELLS (MW-1 THROUGH MW-8)

The water levels in Monitoring Wells MW-1 through MW-8 were measured approximately once per month throughout the 12-month review period. Table 1 presents the water-level data obtained for these monitoring wells for the 10-year historical period from January 2008 through December 2017.

Graphs of the water levels for the 2-year period from January 2016 through December 2017 are shown on Figures 7C, 7D, and 7E. Graphs of the water levels for the 10-year period from January 2008 through December 2017 are shown on Figures 8C, 8D, and 8E.

Monitoring Wells MW-3, MW-4, and MW-6 were mostly dry throughout the 12-month review period, with occasional readings indicating water in the piezometers. The water levels in MW-1 and MW-2 remained fairly consistent showing no correlation to the fluctuation of the reservoir water surface elevation during the 12-month review period. MW-5 continues to follow its pattern of having a subdued response to changes in the reservoir water surface elevation. MW-7 and MW-8 showed little to no response to fluctuations in reservoir water surface elevations.

2.3.3 VIBRATING WIRE PIEZOMETERS (VB-1 THROUGH VB-8)

The vibrating wire piezometers within the upstream side of the dam embankment are read at a terminal station located on the crest of the dam. Data from the vibrating wire piezometers are being collected by the District approximately once per month. The water-level data based on the vibrating wire piezometer readings for the 10-year period from January 2008 through December 2017 can be found in Table 2. Plots of water-level elevations based on readings obtained from Vibrating Wire Piezometers VB-1, VB-2, VB-5, and VB-6 are shown on Figures 9A and 10A. Similar plots for Vibrating Wire Piezometers VB-3, VB-4, VB-7, and VB-8 are shown on Figures 9B and 10B.

Vibrating Wire Piezometers VB-1, VB-2, VB-4, VB-5, VB-6, and VB-8 generally react to changes in the reservoir water surface elevation. Vibrating Wire Piezometers VB-3 and VB-7 are not responding to changes in reservoir levels. Also, it was noted that some of the readings were below the piezometer tip elevation, indicating that both VB-3 and VB-7 are no longer functional.

Erroneous readings in the vibrating wire piezometer temperatures were noticed beginning on December 28, 2005. The District and GENTERRA conducted a review and evaluation of the historical temperature data, and as a result, a method to estimate adjusted temperature values to use in the calculations was developed. It was determined that the average temperature recorded up through the December 28, 2005 readings would be used to replace any erroneous temperature values recorded after the December 28, 2005 readings. Table 2 incorporates the revised temperature readings (shown in red) for the 10-year historical period from January 2008 through December 2017. The resulting plots of the vibrating wire piezometer data are shown in Figures 9A and 9B for the

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two-year period from January 2016 through December 2017, and in Figures 10A and 10B for the 10-year historical period from January 2008 through December 2017.

The differences in the water-level elevation calculations using the erroneous temperature readings and the revised temperature readings ranged from a maximum of 9.74 feet to a minimum of 0.31 feet. The adjusted elevations fit within the historical ranges that have been observed at the piezometers during the period of record (July 2004 through December 2017).

The District determined that the erroneous temperature readings were being caused by operator error and lightning protection equipment failure. The District corrected the operator errors and replaced the lightning protection equipment. Reliable temperature readings have been obtained beginning in January 2013 from the eight vibrating wire piezometers.

2.3.4 PNEUMATIC PIEZOMETERS (C, LA, LR, RA, AND RR SERIES)

The pneumatic piezometers within the dam embankment and in the abutments are read at terminal stations located on the downstream face of the dam. Pneumatic piezometers are being read by the District approximately once per month. The pneumatic piezometer data are provided in Table 3 for the 10-year historical period from January 2008 through December 2017. Plots of water-level elevations based on readings obtained from Pneumatic Piezometers C-1 through C-4 are shown on Figures 11A and 12A. Similar plots for Pneumatic Piezometers C-5 through C-8 are shown on Figures 11B and 12B. Figures 11C and 12C are graphs of water level elevations based on readings obtained from Pneumatic Piezometers C-9, RR-2, LR-1, LR-2, LR-3, and LR-4, and Figures 11D and 12D are similar graphs for Pneumatic Piezometers LA-1, LA-2, RA-1, RA-2, RA-3, and RA-4. As shown on Figure 12E, readings of RA-4 were discontinued from February of 2008 and resumed in September 2011.

Pneumatic Piezometers C-4, LR-3, LR-4, RR-2, RA-1, RA-3, LA-1, and LA-2 generally respond to changes in the reservoir water surface elevation. Pneumatic Piezometers C-6, C-8, and RA-2 exhibited a subdued response to changes in the reservoir water surface elevation, while C-1, C-2, C-3, C-5, C-7, C-9, LR-1, and LR-2 showed little or no response to changes in reservoir levels. Water levels in Pneumatic Piezometer RA-4 appear to increase when the reservoir water surface elevation is low, and then decrease when the reservoir water surface elevation is high. The reliability of the data obtained from Piezometer RA-4 is questionable and assumed to be erroneous.

2.3.5 REVIEW OF PIEZOMETER AND MONITORING WELL DATA

Based on GENTERRA's review of the water-level data obtained from the piezometers and monitoring wells, there are no indications of any adverse conditions in the dam embankment, abutments, or reservoir perimeter. Pneumatic Piezometer RA-4 does not provide reliable data.

2.4 SUBDRAIN FLOW RATES

Subdrain flows are measured by the District at eight seepage monitoring stations. The flows from the East Drain, West Drain, and Filter Drain are measured at three separate V-notch weirs in the

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blow-off structure near the downstream toe of the dam. The flows from Upstream Collector Drain Nos. 1 and 2 are measured at two V-notch weirs at the downstream toe of the dam. The flows from the Downstream Toe Drain and the Floor Drain are measured in two separate V-notch weirs adjacent to the energy dissipator structure. An eighth seepage monitoring location has been added at the outlet of the right groin drain pipe. The locations of the seepage monitoring weirs are shown on Figure 2.

Flow data from the weirs is collected monthly by District personnel.

Measurable seepage flows were observed in the East Drain, West Drain, Filter Drain, Downstream Toe Drain, and Floor Drain. A flow rate of less than one gallon per minute is typically observed at the outlet of the right groin drain pipe. The two Upstream Collector Drains are generally dry. Tabulated data for the historical 10-year period from January 2008 through December 2017 are presented in Table 4. Figures 13A and 13B present graphs of seepage flow rates for the 2-year period from January 2016 through December 2017. Figures 14A and 14B present graphs of the seepage flow rates for the historical 10-year period from January 2008 through December 2017.

Based on GENTERRA's review of the seepage flow data, there are no indications of any adverse conditions at the dam.

2.4.1 SEDIMENT COLLECTION FROM EAST, WEST, AND FILTER DRAINS

During the 2010 review period, the District observed that there was sediment collecting in the East Drain weir box. As requested by the District in 2010, GENTERRA reviewed the test results of the black sediments from East Drain weir box (also identified as a stilling basin). The samples of black sediments from the East Drain weir box that were tested, had been collected by the District, and delivered to URS who was the Dam Safety Consultant to the District at that time. As requested by the District and DSOD, URS and TerraSense, LLC performed laboratory tests to assess the soil classification and whether or not the sediment is organic.

GENTERRA's initial evaluation of the results indicated that these sediments were unusual materials. According to the Unified Soil Classification System (USCS, per ASTM D 2487, "Standard Classification of Soils for Engineering Purposes" (Unified Soil Classification System)), the black sediments from the East Drain weir box can be classified as Organic Silt (OH). Liquid Limit and Plasticity Index values of the black sediments indicate that these sediments originated from bentonite type materials. These sediments were mainly composed of Montmorillonite minerals (bentonite) and organics.

A separate letter was submitted to the District and DSOD by GENTERRA dated June 30, 2010 discussing the issue of the black sediment and providing several recommendations for proceeding with the testing and observation of the black sediment.

On May 29, 2012, the District provided GENTERRA with photographs of the black sediment taken on May 2, 2012. The District noted that approximately two cups of sediment were measured in the

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West Drain collection basin. Based on those observations, it appeared that there was no significant change in the quantity or color of the black sediment that was flowing out of the West Drain. Starting in April 2014, the District began measuring the depth (in inches) and weight of the silt (in pounds), the amount of seepage flow (in gallons per minute), and the reservoir water surface elevation (in feet) monthly for the West, East and Filter Drains.

Based on the review of the data provided by the District from the three subdrains, there has been no sediment observed in the East and Filter Drain since April 2014. Sediment had been observed only from the West Drain since April 2014. The depth and volume of sediment removed from the West Drain is presented in Table 5 along with the amount of seepage measured from the drain. The amount of sediment measured each month since 2014 had decreased to a consistent amount of about two pounds per month by May 2016. Monthly measurements continued to be taken through the end of November 2016. There have not been any increases in the amount of sediment accumulation. The District suspended the collection of sediment in the calendar year 2017. This is preferable to the District in order to minimize the number of times that personnel must enter and descend to the bottom of the vault, which is beneficial for maintaining the health and safety of District personnel.

2.5 MOVEMENT SURVEYS

The District had an initial survey of the horizontal and vertical movements of the dam done by Guida Surveying on December 20, 2004. This was prior to the 2005 refilling of the reservoir. Guida Surveying used the NGVD 29 vertical datum. Beginning in 2005, all surveys are now referenced to the NAVD 88 vertical datum. Three surveys were performed at the dam in the 2005 calendar year. Since 2005, surveys have been performed annually. Tabulated data for the surveying of horizontal and vertical movement for the period from 2004 through 2016 can be found in Table 6. The dam was not surveyed during 2017.

Figures 15A and 16A are graphs of the horizontal and vertical movements for survey monuments SA-1 through SA-3 for the period from 2005 through 2016. Figures 15B and 16B present the horizontal and vertical movements for survey monuments SB-1 through SB-7 for the period from 2005 through 2016. Figures 15C and 16C are graphs of the horizontal and vertical movements for survey monuments SC-1 through SC-8 for the period from 2005 through 2016. Figures 15D and 16D are graphs of the horizontal and vertical movements for survey monuments SD-1 through SD-7 for the period from 2005 through 2016. Survey monuments SE-2, SE-3, SE-5, SE-6 and SE-7 on the upstream face of the dam are not presented in graphs because these monuments are submerged under the water in the reservoir. Similarly, survey monuments SF-1, SF-2, and SF-3 on the bottom of the reservoir are submerged under the water, and therefore cannot be surveyed while there is water in the reservoir.

Based on GENTERRA's review of the survey data, there are no indications of any adverse conditions at the dam.

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SECTION 3: FIELD EVALUATIONS

3.1 FIELD EVALUATION OF APRIL 5, 2017

A field evaluation of San Joaquin Dam and Reservoir was performed on April 5, 2017 by Nicholas Josten, P.E. and J. Will Kulikowski of GENTERRA; and Jeff Smyth, Bill Wesson, and Mike Chandler of the District; and Brandon Cruz, P.E. of the DSOD. The reservoir water surface was at an elevation of approximately 465.5 feet (NAVD 88) during the field evaluation. Photographs were taken and are in the project files at GENTERRA for comparison with future field evaluations.

3.1.1 DAM

The upstream face of the dam is surfaced with the original asphalt concrete (AC) placed during the construction of the dam. During the period that the reservoir was empty from the late 1990's to 2005, the binding in the original AC had become extremely weathered. As a result, large cracks and potholes have formed, exposing the upstream core of the dam in some joints and holes. These cracks and potholes were located throughout the upstream face of the dam; had no vertical or horizontal offset; and varied in length, width, and depth. According to the District, minor repairs, such as patching cracks and potholes with new AC, have been performed in some areas on the AC. The District is planning to continue performing repairs annually to prevent erosion and loss of upstream core material from the dam. Based on visual observation and reports from District personnel, the number and severity of the crack and pothole formation increases every year. The District should consider completely replacing the original, weathered AC on the upstream face of the dam to prevent any significant damage to the upstream core material. During this field evaluation on April 5, 2017, most of the upstream slope was not visible due to the relatively high reservoir level. No signs of settlement or instability were observed on the upstream slope of the dam.

The crest of the dam is surfaced with AC and was in satisfactory condition with no signs of settlement.

The downstream face of the dam is covered with soil and grass in the upper-most 20 feet and riprap on the remaining sections of the dam. There are three benches, designated as the upper (Elevation 420.0 feet, NGVD 29), the middle (Elevation 360.0 feet, NGVD 29), and the lower (Elevation 300.0 feet, NGVD 29). No signs of settlement or instability were observed on the downstream slope of the dam.

The left and right concrete V-ditch drains installed in the groins of the dam appeared to be in good structural condition. Sand bags have been placed in areas of the right V-ditch to prevent soil from the adjacent hillside from entering the V-ditch. Both drains were clear of debris.

3.1.2 SPILLWAY

The two spillway intake structures (which are located at the east and west sides of the upstream face of the dam), and the energy dissipator structure (located downstream of the dam) were in satisfactory condition at the time of this field evaluation. Heavy vegetation was growing immediately

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downstream of the energy dissipator. The District should consider clearing this vegetation to prevent the backup of spillway flow.

3.1.3 RESERVOIR

Visible areas around the perimeter of the reservoir were observed during the field evaluation. The northwest portion of the interior slopes of the reservoir is lined with the original AC that was installed during the construction of the dam and reservoir. The AC lining in the northwest portion of the reservoir showed significant signs of distress in the form of various cracks and potholes like the distress observed on the upstream face the dam. Minor repairs, such as patching some of the cracks and potholes with new AC, are performed annually by the District. The District is planning to continue to perform additional repairs on an annual basis. The District should consider complete replacement of the original, weathered AC which lines the northwest portion of the interior slopes of the reservoir.

3.1.4 OUTLET WORKS

DSOD recommends that the outlet and the emergency blow-off valves be exercised and documented in a log at least once per year to confirm operability. DSOD requires the valves be exercised once every three years in the presence of a DSOD representative.

There are five outlet valves located upstream of the dam in the reservoir area. The five valves were below the water surface and were not visible. The five outlet valves were exercised through full cycles on May 26, 2016 in the presence of a DSOD representative. The five outlet valves were exercised on June 6, 2016 but not in the presence of a DSOD representative.

There are two 12-inch-diameter emergency blowoff valves located near the downstream toe of the dam, in the blowoff structure. These two valves are located in-line to minimize the release of water when exercised. Both valves were exercised through a full cycle on July 19, 2016 but not in the presence of a DSOD representative. During this field evaluation on April 5, 2017, the two blowoff valves were exercised in the presence of a DSOD representative.

3.1.5 SEEPAGE

Seepage water was observed flowing over the V-notch weirs of the Downstream Toe Drain and the Floor Drain, located adjacent to the energy dissipator structure. The observed seepage flow rates were within the historical range. Automated instrumentation is used to obtain measurements of the seepage flow rates. The District also obtains manual measurements of the seepage flow rates so that the calibration of the automated instruments can be confirmed, and adjustments can be made to the instrumentation, if needed.

The seepage flow rates in the energy dissipator structure were not measured during this field evaluation but appeared to be within the historical observed range.

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3.1.6 INSTRUMENTATION

The instrumentation panels for the pneumatic piezometers were observed and appeared to be in satisfactory condition. Previous field evaluations and monitoring reports have indicated that some of the original pneumatic piezometers are no longer working properly. This is to be expected as the pneumatic piezometers have exceeded their anticipated lifespan.

Several of the monitoring wells and piezometers were inspected during the field evaluation. The exposed portions of the wells and piezometers appeared to be in generally satisfactory condition.

The survey monuments generally appear to be in satisfactory condition. All instrumentation data is collected by the District and transferred to GENTERRA for inclusion in this report.

3.2 FIELD EVALUATION OF DECEMBER 28, 2017

A field evaluation of San Joaquin Dam and Reservoir was performed on December 28, 2017 by Douglas A. Harriman, P.E. and J. Will Kulikowski of GENTERRA; and Bill Wesson of the District. The reservoir water surface was at an elevation of approximately 422.0 feet (NAVD 88) during the field evaluation. Photographs were taken and are in the project files at GENTERRA for comparison with future field evaluations.

3.2.1 DAM

During this field evaluation on December 28, 2017, the AC reservoir liner was observed continuing to deteriorate. Some of the patch material placed on the upstream face of the dam was observed degrading since the previous field evaluation on April 5, 2017. No signs of settlement or instability were observed on the upstream slope of the dam.

The crest of the dam is surfaced with AC and was in satisfactory condition with no signs of settlement.

No signs of settlement or instability were observed on the downstream slope of the dam.

The left and right concrete V-ditch drains installed in the groins of the dam appeared to be in good structural condition. Sandbags have been placed in areas of the right V-ditch to prevent soil from the adjacent hillside from entering the V-ditch. Both drains were clear of debris.

3.2.2 SPILLWAY

The two spillway intake structures (which are located at the east and west sides of the upstream face of the dam), and the energy dissipator structure (located downstream of the dam) were in satisfactory condition. It was observed that heavy vegetation is continuing to grow immediately downstream of the energy dissipator since the previous field evaluation on April 5, 2017. The District should consider clearing this vegetation to prevent the backup of spillway flow.

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3.2.3 RESERVOIR

Visible areas around the perimeter of the reservoir were inspected during the field evaluation. The areas which have the AC that had been placed during the original construction of the dam and reservoir are showing significant distress and a gradual increase in the amount of linear cracking along the cold joints. No significant change has occurred since the previous field evaluation on April 5, 2017.

3.2.4 OUTLET WORKS

The upper intake valve (at Elevation 450 feet) was above the water surface and appeared to be in good condition. The controls for the outlet valves, located in a shed situated at the top of the reservoir slope along the perimeter road (right side of the dam), appeared to be in good condition. During this field evaluation on December 28, 2017, none of the outlet valves or blowoff valves were exercised. No change has occurred since the previous field evaluation on April 5, 2017.

3.2.5 SEEPAGE

The vault for the Downstream Toe Drain and the Floor Drain was not opened during this field evaluation on December 28, 2017.

The seepage flow rates in the energy dissipator structure were not measured during this field evaluation but appeared to be within the historical observed range. District personnel have noticed a new seepage location where water is present between the energy dissipator structure and the stairs leading up to the entrance roadway. The amount of seepage appeared to be small. This seepage should continue to be observed for any changes.

3.2.6 INSTRUMENTATION

The instrumentation panels for the pneumatic piezometers were observed and appeared to be in satisfactory condition. Previous evaluations and monitoring reports have indicated that some of the original pneumatic piezometers are no longer working properly. This is to be expected as the pneumatic piezometers have exceeded their anticipated lifespan.

Several of the monitoring wells and piezometers were inspected during the field evaluation. The exposed portions of the wells and piezometers appear to be in generally satisfactory condition.

The survey monuments generally appear to be in satisfactory condition. All instrumentation data are collected by the District and transferred to GENTERRA for inclusion in this report.

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SECTION 4: CONCLUSIONS AND RECOMMENDATIONS

4.1 CONCLUSIONS

- 4.1.1 Based on the available data, the dam appears to be performing satisfactorily.
- 4.1.2 Piezometer water-level fluctuations and seepage flow rates appear to be consistent with historical values.
- 4.1.3 The five outlet valves were last exercised on June 6, 2017 but not in the presence of a DSOD representative. The two blowoff valves were last exercised on April 5, 2017 in the presence of a DSOD representative.
- 4.1.4 Horizontal and vertical movement of the survey monuments appears to be normal and consistent with historical values and trends, as determined by survey data through 2016.
- 4.1.5 The AC lining on the upstream face of the dam and interior slopes of the reservoir have continued to deteriorate, and the rate of deterioration has increased.
- 4.1.6 A significant amount of vegetation is growing downstream of the energy dissipator structure.
- 4.1.7 District personnel have noticed a new seepage location where water is present between the energy dissipator structure and the stairs leading up to the entrance roadway. The amount of seepage appeared to be small.

4.2 RECOMMENDATIONS

- 4.2.1 Surveying of the existing survey monuments should be performed annually.
- 4.2.2 The District should continue to monitor monthly the instrumentation at the dam.
- 4.2.3 GENTERRA recommends that the areas containing asphalt concrete lining distress should be investigated and repaired, and consideration should be given to replacing the asphalt concrete lining.
- 4.2.4 The District should consider clearing the vegetation that is growing downstream of the energy dissipator structure to prevent the backup of spillway flow.
- 4.2.5 The District should continue to observe for any changes in the amount of seepage near the energy dissipator structure.
- 4.2.6 The District should continue to implement its rodent abatement program to prevent rodent activity from occurring.

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- 4.2.7** During the normal and routine daily, weekly, and monthly operations at the reservoir, District personnel should always be observing the condition of the dam and appurtenances, looking for signs of distress or movement, increased seepage, or other unusual conditions, and verifying that the critical facilities are functional. Any unusual observations should be reported immediately to a District supervisor and the District's Dam Safety Consultant under contract at the time.
- 4.2.8** GENTERRA recommends a special evaluation of the dam immediately after any earthquake with a Magnitude of 4.5 or greater within a 50-mile radius of the dam, and/or any seismic event that would cause heavy furniture overturning in areas in the vicinity of the dam and reservoir.

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SECTION 5: LIMITATIONS

This report represents the results of our surveillance program for San Joaquin Dam, covering the period from January 2017 through December 2017. Professional services were provided to evaluate the performance of the existing dam based upon review of previous data, field inspections, instrumentation readings, and surveys.

The conclusions and professional opinions presented herein were developed by GENTERRA Consultants, Inc. for the Irvine Ranch Water District in accordance with generally accepted engineering principles and practices. We make no other warranty, either express or implied.

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SECTION 6: REFERENCES

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2. California Department of Water Resources, Division of Safety of Dams (DSOD), 2000, *Dams Within Jurisdiction of the State of California, Bulletin 17-00*; by DSOD; dated July 2000.
3. AECOM, 2016, *2015 Annual Surveillance Report for San Joaquin Dam, DSOD Dam No. 1029-000, Newport Beach, California*; by AECOM; dated April 21, 2016.
4. GENTERRA Consultants, Inc. (GENTERRA), 2014, *Annual Surveillance Report, January 2012 through December 2012 for San Joaquin Dam and Reservoir, No. 1029-0, Newport Beach, California*; by GENTERRA; dated February 11, 2014.
5. GENTERRA, 2013, *Reservoir Slope Stability Evaluation for San Joaquin Dam and Reservoir, No. 1029-0, Newport Beach, California*; by GENTERRA; dated November 15, 2013.
6. GENTERRA, 2012, *Draft Drawdown Program Review Study for San Joaquin Dam and Reservoir, No. 1029-0, Newport Beach, California*; by GENTERRA; dated January 17, 2012.
7. GENTERRA, 2006, *Periodic Surveillance Report, July 2005 through December 2005 for San Joaquin Dam and Reservoir, No. 1029-0, Newport Beach, California*; by GENTERRA; dated February 2, 2006.

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TABLES

**TABLE 1
SAN JOAQUIN DAM
PIEZOMETER AND MONITORING WELL WATER LEVEL MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017**

Monitoring Well ----->			MW-1			MW-2			MW-3			MW-4			MW-5		
Top of Well Elevation ----->			487.8			489.0			509.0			489.9			489.4		
Well Bottom Elevation -->			363.2			409.9			423.0			444.5			406.5		
Date	Reservoir Elevation (feet)	Monthly Rainfall (inches)	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment
1/3/2008	443.20		86.40	401.4		65.40	423.60		86.90	422.1	Wet	45.20	444.7	Dry	73.60	415.8	
1/29/2008	452.20		86.50	401.3		65.04	423.96		86.90	422.1	Wet	45.25	444.7	Dry	70.71	418.7	
2/27/2008	460.80		85.90	401.9		64.70	424.30		86.60	422.4		45.40	444.5	Dry	67.40	422.0	
3/26/2008	468.00		85.70	402.1		63.90	425.10		86.90	422.1		45.20	444.7	Dry	64.40	425.0	
4/29/2008	468.60		83.70	404.1		62.90	426.10		88.00	421.0	Dry	45.50	444.4	Dry	60.50	428.9	
5/29/2008	464.70		84.70	403.1		62.60	426.40		87.00	422.0		45.30	444.6	Dry	61.60	427.8	
6/26/2008	455.70		84.20	403.6		61.90	427.10		86.30	422.7		45.20	444.7	Dry	62.50	426.9	
7/29/2008	447.30	0.00	84.00	403.8		61.20	427.80		87.00	422.0		45.40	444.5		65.40	424.0	
8/28/2008	438.80	0.00	83.50	404.3		58.20	430.80		89.30	419.7		45.20	444.7	Dry	66.90	422.5	
9/26/2008	430.70	0.00	83.30	404.5		60.90	428.10		89.60	419.4		45.20	444.7	Dry	68.50	420.9	
10/29/2008	412.50	0.00	83.40	404.4		61.10	427.90		87.50	421.5		45.20	444.7	Dry	70.70	418.7	
11/25/2008	404.70	2.60	83.30	404.5		60.70	428.30		86.90	422.1	Dry	45.20	444.7	Dry	71.50	417.9	
12/30/2008	440.90	3.42	83.40	404.4		61.00	428.00		86.90	422.1	Dry	45.20	444.7	Dry	73.70	415.7	
1/28/2009	463.70	0.17	83.00	404.8		61.00	428.00		86.70	422.3		45.20	444.7	Dry	67.80	421.6	
2/25/2009	470.10	3.35	82.60	405.2		60.80	428.20		85.40	423.6		45.10	444.8	Dry	63.40	426.0	
3/26/2009	469.40	0.19	82.20	405.6		60.60	428.40		86.50	422.5	Dry	45.20	444.7	Dry	60.90	428.5	
4/29/2009	466.90	0.07	82.20	405.6		60.70	428.30		86.80	422.2	Dry	45.40	444.5	Dry	60.50	428.9	
5/18/2009	466.70	0.00	81.90	405.9		60.70	428.30		87.20	421.8	Dry	45.20	444.7	Dry	60.70	428.7	
5/29/2009	465.00	0.00	81.80	406.0		60.60	428.40		85.30	423.7		45.30	444.6	Dry	60.80	428.6	
6/30/2009	460.20	0.00	81.30	406.5		60.60	428.40		87.00	422.0	Dry	45.40	444.5	Dry	62.20	427.2	
7/30/2009	451.10	0.00	81.20	406.6		60.10	428.90		87.00	422.0	Dry	45.20	444.7	Dry	63.70	425.7	
8/25/2009	440.10	0.00	81.00	406.8		59.90	429.10		86.40	422.6		45.20	444.7	Dry	65.80	423.6	
9/30/2009	432.20	0.00	81.10	406.7		59.85	429.15		87.00	422.0		45.20	444.7	Dry	68.00	421.4	
10/29/2009	431.40	0.53	81.20	406.6		60.30	428.70		87.04	422.0		45.25	444.7	Dry	69.62	419.8	
12/1/2009	427.40	0.00	81.10	406.7		60.90	428.10		88.60	420.4	Dry	45.70	444.2	Dry	71.00	418.4	
12/29/2009	448.10	2.06	81.36	406.4		61.30	427.70		87.00	422.0		45.25	444.7	Dry	71.36	418.0	
1/27/2010	465.60	4.62	80.90	406.9		61.50	427.50		88.60	420.4	Dry	45.00	444.9	Dry	67.20	422.2	
2/25/2010	470.20	2.51	81.40	406.4		61.50	427.50		87.00	422.0	Dry	45.20	444.7	Dry	62.60	426.8	
3/29/2010	465.70	0.99	80.60	407.2		61.40	427.60		87.20	421.8		45.20	444.7	Dry	61.50	427.9	
4/4/2010	465.00		80.50	407.3		61.40	427.60		87.10	421.9		45.30	444.6	Dry	61.50	427.9	
4/27/2010	468.40	1.23	80.50	407.3		61.20	427.80		88.60	420.4	Dry	45.30	444.6	Dry	61.70	427.7	
5/27/2010	463.30	0.05	80.70	407.1		61.60	427.40		86.90	422.1	Dry	45.30	444.6	Dry	61.40	428.0	
6/30/2010	454.70	0.00	80.50	407.3		61.60	427.40		87.00	422.0		45.00	444.9	Dry	62.80	426.6	
7/28/2010	445.60	0.00	80.60	407.2		61.60	427.40		87.10	421.9		45.20	444.7	Dry	64.90	424.5	
8/31/2010	437.10	0.00	80.80	407.0		62.20	426.80		87.10	421.9		45.30	444.6	Dry	67.20	422.2	
9/29/2010	422.70	0.00	80.60	407.2		62.30	426.70		87.00	422.0		45.30	444.6	Dry	68.60	420.8	
10/27/2010	426.40	2.38	81.00	406.8		62.80	426.20		86.90	422.1	Dry	45.30	444.6	Dry	70.50	418.9	
11/29/2010	439.80	0.97	81.50	406.3		63.40	425.60		86.90	422.1	Dry	45.20	444.7	Dry	71.70	417.7	
12/30/2010	456.60	8.62	80.90	406.9		63.10	425.90		87.40	421.6	Dry	45.40	444.5	Dry	68.80	420.6	

Note:
Elevations are in feet relative to NAVD88 datum.

**TABLE 1
SAN JOAQUIN DAM
PIEZOMETER AND MONITORING WELL WATER LEVEL MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017**

Monitoring Well ----->			MW-1			MW-2			MW-3			MW-4			MW-5		
Top of Well Elevation ----->			487.8			489.0			509.0			489.9			489.4		
Well Bottom Elevation -->			363.2			409.9			423.0			444.5			406.5		
Date	Reservoir Elevation (feet)	Monthly Rainfall (inches)	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment
2/1/2011	468.90	0.92	80.60	407.2		62.90	426.10		87.00	422.0		45.20	444.7		63.40	426.0	
2/23/2011	469.00	0.99	80.60	407.2		62.80	426.20		87.10	421.9	Dry	45.25	444.7	Dry	62.18	427.2	
3/29/2011	470.30	2.93	80.50	407.3		62.50	426.50		87.30	421.7		45.20	444.7	Dry	60.90	428.5	
4/27/2011	464.80	0.19	80.25	407.6		62.55	426.45		87.00	422.0	Dry	45.25	444.7	Dry	60.95	428.5	
5/26/2011	457.30	0.48	80.10	407.7		62.60	426.40		88.20	420.8	Dry	45.30	444.6	Dry	62.50	426.9	
6/28/2011	443.50	0.05	79.90	407.9		62.70	426.30		88.00	421.0	Dry	45.30	444.6	Dry	64.60	424.8	
7/29/2011	425.10	0.00	80.25	407.6		62.80	426.20		88.30	420.7	Dry	45.25	444.7	Dry	67.20	422.2	
8/24/2011	418.00	0.00	80.40	407.4		62.90	426.10		87.00	422.0	Dry	45.20	444.7	Dry	69.00	420.4	
9/27/2011	400.90	0.12	80.60	407.2		63.30	425.70		87.30	421.7	Dry	45.25	444.7	Dry	71.45	418.0	
10/26/2011	402.20	1.25	81.20	406.6		63.90	425.10		88.50	420.5	Dry	45.80	444.1		73.20	416.2	
11/30/2011	425.10	1.38	81.30	406.5		63.80	425.20		87.00	422.0		45.20	444.7		73.00	416.4	
12/21/2011	435.70	0.32	81.50	406.3		64.20	424.80		88.30	420.7		45.60	444.3		73.60	415.8	
1/24/2012	441.40	0.53	81.70	406.1		64.70	424.30		87.00	422.0		45.20	444.7		70.10	419.3	
2/28/2012	448.40	0.42	82.10	405.7		65.20	423.80		88.20	420.8		45.60	444.3		68.40	421.0	
3/26/2012	452.70	1.06	81.80	406.0		64.90	424.10		86.90	422.1		45.20	444.7		67.50	421.9	
4/23/2012	463.40	1.32	81.40	406.4		64.80	424.20		86.30	422.7		45.80	444.1		64.40	425.0	
5/30/2012	457.30	0.02	81.50	406.3		64.70	424.30		86.60	422.4		46.40	443.5		62.70	426.7	
6/13/2012	452.90	0.02	81.30	406.5		64.70	424.30		86.60	422.4		45.25	444.7		63.00	426.4	
6/26/2012	450.20	0.00	81.40	406.4		64.90	424.10		89.50	419.5		45.30	444.6		63.80	425.6	
7/24/2012	439.80	0.00	81.60	406.2		65.10	423.90		88.80	420.2		46.50	443.4		65.90	423.5	
8/8/2012	437.60	0.12	81.50	406.3		64.30	424.70		88.80	420.2		46.20	443.7		66.80	422.6	
8/22/2012	433.40	0.00	81.55	406.3		65.20	423.80		86.90	422.1		45.20	444.7		67.70	421.7	
8/29/2012	431.30	0.00	81.50	406.3		65.10	423.90		86.10	422.9		45.30	444.6		67.90	421.5	
9/25/2012	420.80	0.00	81.75	406.1		65.30	423.70		87.00	422.0		45.20	444.7		68.00	421.4	
10/31/2012	412.30	0.26	82.30	405.5		65.50	423.50		89.40	419.6		46.40	443.5		72.10	417.3	
11/27/2012	420.80	0.58	82.90	404.9		65.70	423.30		86.90	422.1		45.10	444.8		73.40	416.0	
12/18/2012	448.00	1.44	82.30	405.5		65.30	423.70		86.80	422.2		45.30	444.6		72.40	417.0	
1/29/2013	468.60	1.18	82.40	405.4		65.50	423.50		88.80	420.2		46.50	443.4		63.20	426.2	
2/28/2013	469.20	0.30	81.90	405.9		64.80	424.20		86.90	422.1		46.70	443.2		60.70	428.7	
3/27/2013	468.30	0.50	81.35	406.5		64.70	424.30		87.10	421.9		45.20	444.7		59.85	429.6	
4/25/2013	462.70	0.00	81.20	406.6		64.60	424.40		87.00	422.0		45.25	444.7		60.00	429.4	
5/21/2013	454.20	0.00	81.10	406.7		64.60	424.40		86.90	422.1		45.20	444.7		61.40	428.0	
6/25/2013	439.30	0.00	81.20	406.6		64.75	424.25		87.00	422.0		45.20	444.7		64.50	424.9	
7/23/2013	431.50	0.00	81.40	406.4		64.80	424.20		87.10	421.9	Dry	45.30	444.6	Dry	66.80	422.6	
8/21/2013	418.00	0.00	81.70	406.1		64.90	424.10		86.90	422.1	Dry	45.20	444.7	Dry	68.50	420.9	
9/24/2013	404.00	0.00	82.00	405.8		65.00	424.00		86.90	422.1	Dry	45.00	444.9	Dry	71.20	418.2	
10/29/2013	400.60	0.00	82.50	405.3		65.40	423.60		87.30	421.7	Dry	45.30	444.6	Dry	72.90	416.5	
11/26/2013	407.90	0.44	83.00	404.8		69.70	419.30		87.30	421.7	Dry	45.20	444.7	Dry	74.80	414.6	
12/19/2013	425.80	0.54	82.50	405.3		66.40	422.60		86.70	422.3	Dry	45.20	444.7	Dry	73.20	416.2	

Note:
Elevations are in feet relative to NAVD88 datum.

**TABLE 1
SAN JOAQUIN DAM
PIEZOMETER AND MONITORING WELL WATER LEVEL MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017**

Monitoring Well ----->			MW-1			MW-2			MW-3			MW-4			MW-5		
Top of Well Elevation ----->			487.8			489.0			509.0			489.9			489.4		
Well Bottom Elevation -->			363.2			409.9			423.0			444.5			406.5		
Date	Reservoir Elevation (feet)	Monthly Rainfall (inches)	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment
1/28/2014	439.70	0.00	83.20	404.6		66.50	422.50		86.70	422.3	Dry	45.20	444.7	Dry	71.60	417.8	
2/25/2014	449.70	0.83	83.20	404.6		66.70	422.30		86.70	422.3	Dry	45.30	444.6		69.10	420.3	
3/26/2014	465.10		83.00	404.8		66.80	422.20		88.70	420.3	Dry	45.40	444.5	Dry	64.20	425.2	
3/28/2014	465.70	1.15	83.20	404.6		66.90	422.10		87.00	422.0		45.20	444.7		64.00	425.4	
4/29/2014	465.30	0.43	82.90	404.9		66.90	422.10		89.10	419.9	Dry	45.10	444.8	Dry	61.30	428.1	
5/28/2014	450.60	0.00	82.90	404.9		66.90	422.10		86.80	422.2		45.20	444.7	Dry	62.60	426.8	
6/25/2014	440.10	0.00	82.80	405.0		67.90	421.10		86.90	422.1		45.10	444.8		65.00	424.4	
7/29/2014	431.20	0.00	83.00	404.8		67.00	422.00		88.30	420.7	Dry	45.30	444.6	Dry	67.40	422.0	
8/26/2014	419.50	0.02	83.20	404.6		67.20	421.80		86.90	422.1	Dry	45.20	444.7	Dry	69.10	420.3	
9/23/2014	405.30	0.00	83.30	404.5		67.00	422.00		86.80	422.2	Dry	44.60	445.3	Dry	71.20	418.2	
10/29/2014	400.90	0.00	83.60	404.2		66.80	422.20		88.10	420.9	Dry	45.30	444.6	Dry	73.30	416.1	
11/25/2014	410.90	0.25	84.20	403.6		67.30	421.70		86.80	422.2	Dry	45.20	444.7	Dry	75.50	413.9	
12/30/2014	430.60	2.94	83.80	404.0		66.90	422.10		86.80	422.2		45.20	444.7	Dry	74.50	414.9	
1/27/2015	466.70	0.83	83.70	404.1		67.10	421.90		88.30	420.7	Dry	45.30	444.6	Dry	64.80	424.6	
2/25/2015	468.90	0.69	83.40	404.4		67.10	421.90		86.80	422.2	Dry	45.20	444.7	Dry	60.50	428.9	
3/26/2015	465.90	0.61	83.10	404.7		66.80	422.20		86.90	422.1	Dry	45.10	444.8		59.10	430.3	
4/28/2015	465.70	0.20	82.50	405.3		66.50	422.50		87.00	422.0	Dry	45.20	444.7	Dry	59.00	430.4	
5/28/2015	466.40	1.08	82.50	405.3		66.30	422.70		88.30	420.7	Dry	45.50	444.4	Dry	58.50	430.9	
6/30/2015	454.50	0.00	82.00	405.8		66.10	422.90		87.00	422.0		45.20	444.7	Dry	59.70	429.7	
7/28/2015	445.60	0.00	82.20	405.6		65.90	423.10		86.90	422.1	Dry	45.20	444.7	Dry	62.60	426.8	
8/28/2015	437.60	0.00	82.20	405.6		66.00	423.00		86.90	422.1	Dry	45.00	444.9		64.90	424.5	
9/24/2015	426.90	1.51	82.40	405.4		65.80	423.20		86.90	422.1	Dry	45.20	444.7	Dry	66.90	422.5	
10/27/2015	415.40	0.49	82.70	405.1		66.00	423.00		87.30	421.7	Dry	45.30	444.6	Dry	69.10	420.3	
11/19/2015	412.90	0.09	83.00	404.8		66.70	422.30		87.00	422.0	Dry	45.20	444.7		70.60	418.8	
12/22/2015	425.50	0.69	83.10	404.7		66.90	422.10		87.80	421.2	Dry	45.50	444.4	Dry	71.60	417.8	
1/27/2016	463.60	2.86	83.10	404.7		67.50	421.50		87.00	422.0	Dry	45.30	444.6	Dry	67.60	421.8	
2/25/2016	468.90	0.25	83.50	404.3		67.30	421.70		87.20	421.8	Dry	44.80	445.1		61.10	428.3	
3/30/2016	468.00	1.44	82.80	405.0		62.20	426.80		87.10	421.9		45.30	444.6	Dry	58.80	430.6	
4/28/2016	461.30	0.30	82.70	405.1		67.20	421.80		88.30	420.7	Dry	44.40	445.5	Dry	58.90	430.5	
5/25/2016	451.30	0.18	82.85	405.0		67.30	421.70		87.00	422.0		45.30	444.6	Dry	61.30	428.1	
6/28/2016	414.10	0.00	82.80	405.0		67.30	421.70		87.10	421.9		45.20	444.7	Dry	63.40	426.0	
7/27/2016	434.20	0.00	82.80	405.0		67.40	421.60		87.20	421.8	Dry	45.40	444.5	Dry	65.50	423.9	
8/23/2016	418.60	0.00	83.30	404.5		67.50	421.50		86.80	422.2	Dry	45.20	444.7	Dry	67.90	421.5	
9/27/2016	406.40	0.00	83.40	404.4		67.30	421.70		87.20	421.8	Dry	45.40	444.5	Dry	69.80	419.6	
10/26/2016	404.00	0.17	84.00	403.8		67.40	421.60		86.30	422.7	Dry	45.30	444.6	Dry	72.00	417.4	
11/22/2016	413.60	1.13	84.40	403.4		67.70	421.30		88.30	420.7	Dry	45.40	444.5	Dry	73.20	416.2	
12/20/2016	441.10	3.48	84.60	403.2		67.65	421.35		88.30	420.7	Dry	45.30	444.6	Dry	72.40	417.0	

Note:
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**TABLE 1
SAN JOAQUIN DAM
PIEZOMETER AND MONITORING WELL WATER LEVEL MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017**

Monitoring Well ----->			MW-1			MW-2			MW-3			MW-4			MW-5		
Top of Well Elevation ----->			487.8			489.0			509.0			489.9			489.4		
Well Bottom Elevation -->			363.2			409.9			423.0			444.5			406.5		
Date	Reservoir Elevation (feet)	Monthly Rainfall (inches)	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment
1/26/2017	471.60	5.67	84.50	403.3		67.70	421.30		84.40	424.6		45.20	444.7	Dry	61.80	427.6	
2/24/2017	472.05	3.13	84.10	403.7		67.50	421.50		88.30	420.7	Dry	45.30	444.6	Dry	57.60	431.8	
2/25/2017	472.00		84.05	403.8		67.45	421.55		88.30	420.7	Dry	45.20	444.7	Dry	57.50	431.9	
2/26/2017	472.00		84.10	403.7		67.40	421.60		88.30	420.7	Dry	45.20	444.7	Dry	57.25	432.2	
2/27/2017	472.00		83.90	403.9		67.50	421.50		88.30	420.7	Dry	45.20	444.7	Dry	57.10	432.3	
2/28/2017	471.90		83.90	403.9		68.21	420.79		88.00	421.0	Dry	45.30	444.6	Dry	57.25	432.2	
3/1/2017	471.90		84.20	403.6		67.60	421.40		87.00	422.0	Dry	45.20	444.7	Dry	57.30	432.1	
3/2/2017	471.90		84.00	403.8		67.36	421.64		86.90	422.1	Dry	45.30	444.6	Dry	57.20	432.2	
3/29/2017	467.90	0.10	83.70	404.1		67.30	421.70		87.20	421.8	Dry	45.10	444.8	Dry	56.90	432.5	
4/27/2017	457.60	0.04	83.30	404.5		67.10	421.90		86.90	422.1	Dry	45.10	444.8	Dry	58.30	431.1	
5/23/2017	453.50	0.43	83.40	404.4		67.10	421.90		88.30	420.7	Dry	45.30	444.6	Dry	60.50	428.9	
6/21/2017	447.40	0.00	83.20	404.6		66.80	422.20		87.10	421.9	Dry	45.20	444.7	Dry	61.60	427.8	
7/26/2017	435.10	0.00	83.40	404.4		66.80	422.20		87.70	421.3	Dry	45.30	444.6	Dry	64.50	424.9	
8/25/2017	420.10	0.00	83.40	404.4		66.10	422.90		86.90	422.1	Dry	45.20	444.7	Dry	66.70	422.7	
9/27/2017	407.10	0.00	83.60	404.2		65.60	423.40		86.70	422.3	Dry	45.30	444.6	Dry	69.20	420.2	
10/26/2017	395.00	0.00	83.80	404.0		66.30	422.70		86.80	422.2	Dry	45.40	444.5	Dry	71.00	418.4	
11/28/2017	409.00	0.09	84.00	403.8		66.20	422.80		86.90	422.1	Dry	45.30	444.6	Dry	72.50	416.9	
12/20/2017	416.80	0.00	84.50	403.3		66.60	422.40		87.20	421.8	Dry	45.00	444.9	Dry	73.40	416.0	
1/24/2018	434.50	1.31	84.40	403.4		65.90	423.10		88.50	420.5	Dry	45.70	444.2	Dry	72.30	417.1	

Note:
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**TABLE 1
SAN JOAQUIN DAM
PIEZOMETER AND MONITORING WELL WATER LEVEL MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017**

Monitoring Well ----->			MW-6			MW-7			MW-8			CP-1A			CP-1B		
Top of Well Elevation ----->			481.4			463.3			512.8			484.4			484.3		
Well Bottom Elevation -->			404.9			397.3			419.8								
Date	Reservoir Elevation (feet)	Monthly Rainfall (inches)	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment
1/3/2008	443.20		82.50	398.9	Dry	19.20	444.1		18.60	494.2		39.30	445.1		37.40	446.9	Dry
1/29/2008	452.20		76.50	404.9	Dry	19.87	443.4		18.46	494.3		39.00	445.4		37.24	447.1	Dry
2/27/2008	460.80		76.70	404.7		19.00	444.3		18.10	494.7		38.50	445.9		37.30	447.0	
3/26/2008	468.00		76.50	404.9	Dry	18.40	444.9		18.00	494.8		38.20	446.2		37.20	447.1	Dry
4/29/2008	468.60		82.00	399.4	Dry	17.90	445.4		18.00	494.8		37.70	446.7		37.30	447.0	Dry
5/29/2008	464.70		77.00	404.4		18.30	445.0		19.00	493.8		37.90	446.5		37.00	447.3	Dry
6/26/2008	455.70		76.50	404.9		18.10	445.2		18.70	494.1		37.90	446.5		37.10	447.2	
7/29/2008	447.30	0.00	83.30	398.1	Dry	18.40	444.9		18.40	494.4		38.20	446.2		37.30	447.0	
8/28/2008	438.80	0.00	86.50	394.9		18.40	444.9		18.70	494.1		38.30	446.1		33.50	450.8	
9/26/2008	430.70	0.00	84.60	396.8	Dry	18.60	444.7		18.30	494.5		38.50	445.9		37.60	446.7	dry
10/29/2008	412.50	0.00	76.40	405.0		18.50	444.8		19.20	493.6		38.90	445.5		37.20	447.1	dry
11/25/2008	404.70	2.60	76.40	405.0	Dry	18.70	444.6		19.10	493.7		39.00	445.4		37.30	447.0	dry
12/30/2008	440.90	3.42	76.40	405.0	Dry	18.40	444.9		18.50	494.3		39.00	445.4		37.20	447.1	dry
1/28/2009	463.70	0.17	76.40	405.0	Dry	17.50	445.8		18.20	494.6		38.20	446.2		37.30	447.0	dry
2/25/2009	470.10	3.35	76.40	405.0		17.00	446.3		17.80	495.0		38.00	446.4		37.00	447.3	dry
3/26/2009	469.40	0.19	76.40	405.0	Dry	16.40	446.9		17.80	495.0		38.00	446.4		37.30	447.0	dry
4/29/2009	466.90	0.07	76.40	405.0	Dry	17.20	446.1		18.30	494.5		38.10	446.3		37.30	447.0	dry
5/18/2009	466.70	0.00	76.50	404.9	Dry	17.50	445.8		18.50	494.3		37.90	446.5		37.20	447.1	dry
5/29/2009	465.00	0.00	76.30	405.1	Dry	17.70	445.6		18.60	494.2		37.90	446.5		37.20	447.1	
6/30/2009	460.20	0.00	76.40	405.0	Dry	17.90	445.4		18.60	494.2		37.90	446.5		37.40	446.9	Dry
7/30/2009	451.10	0.00	76.30	405.1	Dry	18.10	445.2		19.50	493.3		38.00	446.4		37.20	447.1	Dry
8/25/2009	440.10	0.00	76.30	405.1	Dry	18.00	445.3		19.80	493.0		38.10	446.3		37.20	447.1	Dry
9/30/2009	432.20	0.00	76.30	405.1	Dry	18.50	444.8		19.80	493.0		38.60	445.8		37.20	447.1	Dry
10/29/2009	431.40	0.53	76.50	404.9	Dry	19.20	444.1		19.50	493.3		38.95	445.5		37.25	447.1	Dry
12/1/2009	427.40	0.00	76.40	405.0	Dry	19.40	443.9		19.80	493.0		39.20	445.2		37.30	447.0	Dry
12/29/2009	448.10	2.06	76.40	405.0	Dry	19.80	443.5		19.81	493.0		39.21	445.2		37.25	447.1	Dry
1/27/2010	465.60	4.62	76.40	405.0	Dry	19.80	443.5		19.80	493.0		38.70	445.7		37.20	447.1	Dry
2/25/2010	470.20	2.51	76.30	405.1	Dry	19.70	443.6		18.30	494.5		38.20	446.2		37.30	447.0	Dry
3/29/2010	465.70	0.99	76.30	405.1	Dry	19.00	444.3		18.30	494.5		38.30	446.1		37.10	447.2	Dry
4/4/2010	465.00		76.30	405.1	Dry	18.80	444.5		17.90	494.9		38.10	446.3		37.30	447.0	Dry
4/27/2010	468.40	1.23	76.30	405.1	Dry	18.80	444.5		18.00	494.8		38.00	446.4		37.30	447.0	Dry
5/27/2010	463.30	0.05	76.30	405.1	Dry	18.90	444.4		19.40	493.4		38.00	446.4		37.20	447.1	Dry
6/30/2010	454.70	0.00	76.30	405.1	Dry	19.00	444.3		18.80	494.0		38.10	446.3		37.30	447.0	Dry
7/28/2010	445.60	0.00	76.30	405.1	Dry	19.50	443.8		19.10	493.7		38.50	445.9		37.30	447.0	Dry
8/31/2010	437.10	0.00	76.30	405.1	Dry	19.60	443.7		19.40	493.4		38.90	445.5		37.30	447.0	Dry
9/29/2010	422.70	0.00	76.30	405.1	Dry	19.70	443.6		20.00	492.8		39.20	445.2		37.40	446.9	Dry
10/27/2010	426.40	2.38	76.30	405.1	Dry	20.00	443.3		20.10	492.7		39.50	444.9		37.30	447.0	Dry
11/29/2010	439.80	0.97	76.30	405.1	Dry	20.70	442.6		20.10	492.7		39.70	444.7		37.20	447.1	Dry
12/30/2010	456.60	8.62	83.90	397.5	Dry	19.00	444.3		19.40	493.4		38.80	445.6		35.70	448.6	

Note:
Elevations are in feet relative to NAVD88 datum.

**TABLE 1
SAN JOAQUIN DAM
PIEZOMETER AND MONITORING WELL WATER LEVEL MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017**

Monitoring Well ----->			MW-6			MW-7			MW-8			CP-1A			CP-1B		
Top of Well Elevation ----->			481.4			463.3			512.8			484.4			484.3		
Well Bottom Elevation -->			404.9			397.3			419.8								
Date	Reservoir Elevation (feet)	Monthly Rainfall (inches)	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment
2/1/2011	468.90	0.92	76.40	405.0	Dry	18.30	445.0		18.30	494.5		38.30	446.1		37.20	447.1	
2/23/2011	469.00	0.99	76.33	405.1	Dry	17.55	445.8		18.18	494.6		38.00	446.4		37.25	447.1	Dry
3/29/2011	470.30	2.93	76.30	405.1	Dry	17.10	446.2		17.60	495.2		37.70	446.7		36.80	447.5	
4/27/2011	464.80	0.19	76.30	405.1	Dry	16.65	446.7		17.72	495.1		37.52	446.9		37.23	447.1	Dry
5/26/2011	457.30	0.48	76.30	405.1	Dry	16.70	446.6		18.10	494.7		37.60	446.8		37.30	447.0	Dry
6/28/2011	443.50	0.05	76.30	405.1	Dry	16.90	446.4		18.40	494.4		37.80	446.6		37.20	447.1	Dry
7/29/2011	425.10	0.00	76.20	405.2	Dry	17.40	445.9		18.60	494.2		38.15	446.3		36.60	447.7	Dry
8/24/2011	418.00	0.00	76.30	405.1	Dry	17.70	445.6		19.20	493.6		38.40	446.0		37.20	447.1	Dry
9/27/2011	400.90	0.12	76.30	405.1	Dry	17.90	445.4		19.65	493.2		38.80	445.6		37.30	447.0	Dry
10/26/2011	402.20	1.25	76.50	404.9	Dry	18.30	445.0		19.90	492.9		38.80	445.6		36.80	447.5	
11/30/2011	425.10	1.38	76.30	405.1	Dry	17.70	445.6		19.30	493.5		39.10	445.3		36.60	447.7	
12/21/2011	435.70	0.32	76.30	405.1	Dry	18.00	445.3		19.40	493.4		39.50	444.9		37.20	447.1	
1/24/2012	441.40	0.53	76.30	405.1	Dry	18.70	444.6		19.50	493.3		39.00	445.4		37.20	447.1	
2/28/2012	448.40	0.42	76.30	405.1	Dry	19.40	443.9		20.00	492.8		39.20	445.2		37.30	447.0	
3/26/2012	452.70	1.06	76.30	405.1	Dry	19.40	443.9		19.90	492.9		39.00	445.4		37.20	447.1	
4/23/2012	463.40	1.32	76.30	405.1	Dry	19.20	444.1		19.70	493.1		38.60	445.8		37.50	446.8	
5/30/2012	457.30	0.02	76.30	405.1	Dry	19.30	444.0		19.50	493.3		38.50	445.9		37.30	447.0	
6/13/2012	452.90	0.02	76.30	405.1	Dry	19.20	444.1		19.30	493.5		38.40	446.0		37.30	447.0	
6/26/2012	450.20	0.00	76.30	405.1	Dry	19.20	444.1		19.30	493.5		38.50	445.9		37.40	446.9	
7/24/2012	439.80	0.00	76.30	405.1	Dry	19.40	443.9		19.70	493.1		38.90	445.5		37.40	446.9	
8/8/2012	437.60	0.12	76.30	405.1	Dry	19.30	444.0		19.60	493.2		38.90	445.5		37.40	446.9	
8/22/2012	433.40	0.00	76.30	405.1	Dry	19.30	444.0		19.40	493.4		39.10	445.3		36.70	447.6	
8/29/2012	431.30	0.00	76.30	405.1	Dry	19.10	444.2		19.20	493.6		39.00	445.4		37.20	447.1	
9/25/2012	420.80	0.00	76.30	405.1	Dry	19.10	444.2		19.30	493.5		39.10	445.3		37.20	447.1	
10/31/2012	412.30	0.26	76.30	405.1	Dry	19.40	443.9		20.10	492.7		39.60	444.8		37.40	446.9	
11/27/2012	420.80	0.58	76.30	405.1	Dry	19.40	443.9		20.40	492.4		39.90	444.5		37.30	447.0	
12/18/2012	448.00	1.44	76.30	405.1	Dry	19.20	444.1		20.45	492.4		39.35	445.1		37.00	447.3	
1/29/2013	468.60	1.18	76.30	405.1	Dry	19.80	443.5		21.10	491.7		38.40	446.0		37.40	446.9	
2/28/2013	469.20	0.30	76.30	405.1	Dry	19.80	443.5		21.40	491.4		38.00	446.4		37.40	446.9	
3/27/2013	468.30	0.50	76.30	405.1	Dry	19.75	443.6		21.55	491.3		38.10	446.3		37.25	447.1	
4/25/2013	462.70	0.00	76.60	404.8		19.60	443.7		21.60	491.2		38.40	446.0		37.30	447.0	
5/21/2013	454.20	0.00	76.60	404.8		19.80	443.5		21.70	491.1		38.80	445.6		37.30	447.0	
6/25/2013	439.30	0.00	76.60	404.8	Dry	20.00	443.3		22.25	490.6		39.30	445.1		37.10	447.2	
7/23/2013	431.50	0.00	76.60	404.8	Dry	20.10	443.2		22.35	490.5		39.80	444.6		36.60	447.7	Dry
8/21/2013	418.00	0.00	76.30	405.1	Dry	20.10	443.2		22.40	490.4		64.10	420.3		37.50	446.8	Dry
9/24/2013	404.00	0.00	76.50	404.9	Dry	20.20	443.1		22.40	490.4		40.70	443.7		37.20	447.1	Dry
10/29/2013	400.60	0.00	76.60	404.8	Dry	20.40	442.9		22.65	490.2		41.00	443.4		37.20	447.1	Dry
11/26/2013	407.90	0.44	76.30	405.1	Dry	20.50	442.8		23.40	489.4		41.30	443.1		37.20	447.1	Dry
12/19/2013	425.80	0.54	76.30	405.1	Dry	20.30	443.0		23.60	489.2		41.00	443.4		37.40	446.9	Dry

Note:
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**TABLE 1
SAN JOAQUIN DAM
PIEZOMETER AND MONITORING WELL WATER LEVEL MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017**

Monitoring Well ----->			MW-6			MW-7			MW-8			CP-1A			CP-1B		
Top of Well Elevation ----->			481.4			463.3			512.8			484.4			484.3		
Well Bottom Elevation -->			404.9			397.3			419.8								
Date	Reservoir Elevation (feet)	Monthly Rainfall (inches)	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment
1/28/2014	439.70	0.00	76.30	405.1	Dry	20.60	442.7		23.60	489.2		40.90	443.5		37.40	446.9	Dry
2/25/2014	449.70	0.83	76.60	404.8	Dry	20.60	442.7		23.50	489.3		40.60	443.8		37.25	447.1	Dry
3/26/2014	465.10		76.60	404.8	Dry	20.55	442.8		22.95	489.9		39.90	444.5		37.30	447.0	Dry
3/28/2014	465.70	1.15	76.30	405.1	Dry	20.70	442.6		23.20	489.6		39.90	444.5		37.20	447.1	Dry
4/29/2014	465.30	0.43	76.40	405.0	Dry	20.50	442.8		22.90	489.9		39.70	444.7		37.30	447.0	Dry
5/28/2014	450.60	0.00	76.50	404.9	Dry	20.70	442.6		23.30	489.5		39.80	444.6		37.20	447.1	Dry
6/25/2014	440.10	0.00	76.30	405.1		20.80	442.5		23.80	489.0		39.90	444.5		37.10	447.2	
7/29/2014	431.20	0.00	76.50	404.9	Dry	21.00	442.3		23.50	489.3		40.30	444.1		37.20	447.1	Dry
8/26/2014	419.50	0.02	76.30	405.1	Dry	20.90	442.4		24.20	488.6		40.50	443.9		37.30	447.0	Dry
9/23/2014	405.30	0.00	76.30	405.1	Dry	20.90	442.4		24.50	488.3		40.60	443.8		37.20	447.1	Dry
10/29/2014	400.90	0.00	76.60	404.8	Dry	21.30	442.0		24.85	488.0		41.30	443.1		37.30	447.0	Dry
11/25/2014	410.90	0.25	76.40	405.0	Dry	21.50	441.8		25.20	487.6		41.60	442.8		37.20	447.1	Dry
12/30/2014	430.60	2.94	76.30	405.1	Dry	21.35	442.0		24.10	488.7		41.10	443.3		37.10	447.2	Dry
1/27/2015	466.70	0.83	76.60	404.8	Dry	21.55	441.8		25.00	487.8		39.55	444.9		37.20	447.1	Dry
2/25/2015	468.90	0.69	76.50	404.9	Dry	21.30	442.0		25.20	487.6		39.10	445.3		37.30	447.0	Dry
3/26/2015	465.90	0.61	76.30	405.1	Dry	21.40	441.9		25.60	487.2		39.20	445.2		37.30	447.0	
4/28/2015	465.70	0.20	76.30	405.1	Dry	21.00	442.3		26.00	486.8		39.00	445.4		34.20	450.1	
5/28/2015	466.40	1.08	76.60	404.8	Dry	21.10	442.2		25.80	487.0		39.20	445.2		37.30	447.0	Dry
6/30/2015	454.50	0.00	76.30	405.1	Dry	21.90	441.4		26.30	486.5		39.30	445.1		37.20	447.1	Dry
7/28/2015	445.60	0.00	76.40	405.0	Dry	22.30	441.0		26.70	486.1		39.70	444.7		37.30	447.0	Dry
8/28/2015	437.60	0.00	76.30	405.1	Dry	22.80	440.5		27.20	485.6		40.20	444.2		37.30	447.0	Dry
9/24/2015	426.90	1.51	76.20	405.2	Dry	23.60	439.7		27.40	485.4		40.70	443.7		37.20	447.1	Dry
10/27/2015	415.40	0.49	76.30	405.1	Dry	23.90	439.4		27.60	485.2		41.30	443.1		37.20	447.1	Dry
11/19/2015	412.90	0.09	76.30	405.1	Dry	24.20	439.1		27.90	484.9		41.50	442.9		37.30	447.0	Dry
12/22/2015	425.50	0.69	76.50	404.9	Dry	24.80	438.5		28.30	484.5		41.65	442.8		37.30	447.0	Dry
1/27/2016	463.60	2.86	76.20	405.2		25.80	437.5		28.50	484.3		40.50	443.9		37.30	447.0	Dry
2/25/2016	468.90	0.25	76.60	404.8	Dry	25.10	438.2		25.90	486.9		39.80	444.6		37.30	447.0	Dry
3/30/2016	468.00	1.44	76.30	405.1	Wet	24.90	438.4		27.60	485.2		39.70	444.7		37.20	447.1	Dry
4/28/2016	461.30	0.30	76.60	404.8	Dry	25.00	438.3		28.00	484.8		39.90	444.5		37.30	447.0	Dry
5/25/2016	451.30	0.18	76.30	405.1	Dry	24.80	438.5		28.35	484.5		40.28	444.1		37.25	447.1	Dry
6/28/2016	414.10	0.00	76.40	405.0	Dry	24.40	438.9		28.50	484.3		40.60	443.8		37.20	447.1	Dry
7/27/2016	434.20	0.00	76.20	405.2	Dry	24.30	439.0		28.90	483.9		41.20	443.2		37.30	447.0	Dry
8/23/2016	418.60	0.00	76.20	405.2	Dry	24.50	438.8		28.20	484.6		41.80	442.6		37.30	447.0	Dry
9/27/2016	406.40	0.00	76.50	404.9	Dry	24.80	438.5		27.20	485.6		42.50	441.9		37.20	447.1	Dry
10/26/2016	404.00	0.17	76.30	405.1	Dry	25.40	437.9		28.20	484.6		42.80	441.6		37.20	447.1	Dry
11/22/2016	413.60	1.13	76.60	404.8	Dry	25.70	437.6		28.05	484.8		43.40	441.0		37.20	447.1	Dry
12/20/2016	441.10	3.48	76.60	404.8	Dry	25.65	437.7		27.20	485.6		42.95	441.5		37.30	447.0	Dry

Note:
Elevations are in feet relative to NAVD88 datum.

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SAN JOAQUIN DAM
PIEZOMETER AND MONITORING WELL WATER LEVEL MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017**

Monitoring Well ----->			MW-6			MW-7			MW-8			CP-1A			CP-1B		
Top of Well Elevation ----->			481.4			463.3			512.8			484.4			484.3		
Well Bottom Elevation -->			404.9			397.3			419.8								
Date	Reservoir Elevation (feet)	Monthly Rainfall (inches)	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment
1/26/2017	471.60	5.67	76.30	405.1	Dry	25.20	438.1		25.10	487.7		40.80	443.6		37.20	447.1	Dry
2/24/2017	472.05	3.13	76.60	404.8	Dry	24.20	439.1		24.10	488.7		40.20	444.2		37.20	447.1	Dry
2/25/2017	472.00		76.60	404.8	Dry	24.05	439.3		24.15	488.7		40.15	444.3		37.20	447.1	Dry
2/26/2017	472.00		76.60	404.8	Dry	23.85	439.5		24.20	488.6		40.10	444.3		37.20	447.1	Dry
2/27/2017	472.00		76.40	405.0	Dry	23.90	439.4		24.30	488.5		40.10	444.3		37.30	447.0	Dry
2/28/2017	471.90		76.70	404.7	Dry	23.90	439.4		24.10	488.7		40.20	444.2		37.30	447.0	Dry
3/1/2017	471.90		76.50	404.9	Dry	23.90	439.4		24.10	488.7		40.20	444.2		37.30	447.0	Dry
3/2/2017	471.90		76.30	405.1	Dry	23.90	439.4		24.00	488.8		40.10	444.3		37.20	447.1	Dry
3/29/2017	467.90	0.10	76.30	405.1	Dry	22.70	440.6		23.10	489.7		40.00	444.4		37.20	447.1	Dry
4/27/2017	457.60	0.04	76.30	405.1	Dry	22.00	441.3		23.10	489.7		40.10	444.3		37.20	447.1	Dry
5/23/2017	453.50	0.43	76.60	404.8	Dry	22.00	441.3		23.30	489.5		40.30	444.1		37.20	447.1	Dry
6/21/2017	447.40	0.00	76.30	405.1	Dry	21.70	441.6		23.30	489.5		40.50	443.9		37.20	447.1	Dry
7/26/2017	435.10	0.00	76.30	405.1	Dry	21.80	441.5		23.30	489.5		40.70	443.7		37.20	447.1	Dry
8/25/2017	420.10	0.00	76.30	405.1	Dry	21.70	441.6		23.10	489.7		40.90	443.5		37.10	447.2	Dry
9/27/2017	407.10	0.00	76.40	405.0	Dry	21.90	441.4		23.30	489.5		41.50	442.9		37.30	447.0	Dry
10/26/2017	395.00	0.00	76.30	405.1	Dry	21.70	441.6		23.50	489.3		42.20	442.2		37.20	447.1	Dry
11/28/2017	409.00	0.09	76.60	404.8	Dry	22.00	441.3		23.30	489.5		42.30	442.1		37.20	447.1	Dry
12/20/2017	416.80	0.00	76.20	405.2	Dry	22.30	441.0		23.40	489.4		42.10	442.3		37.30	447.0	Dry
1/24/2018	434.50	1.31	78.50	402.9	Dry	22.10	441.2		22.50	490.3		41.70	442.7		37.80	446.5	Dry

Note:
Elevations are in feet relative to NAVD88 datum.

**TABLE 1
SAN JOAQUIN DAM
PIEZOMETER AND MONITORING WELL WATER LEVEL MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017**

Monitoring Well ----->			CP-2A			CP-2B			CP-3A			CP-3B		
Top of Well Elevation ----->			487.7			487.7			486.0			486.0		
Well Bottom Elevation -->														
Date	Reservoir Elevation (feet)	Monthly Rainfall (inches)	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment
1/3/2008	443.20		35.40	452.3		38.60	449.1		16.60	469.4		20.90	465.1	
1/29/2008	452.20		34.25	453.5		38.42	449.2		16.21	469.8		21.11	464.9	
2/27/2008	460.80		33.10	454.6		37.90	449.8		15.90	470.1		20.60	465.4	
3/26/2008	468.00		32.30	455.4		37.50	450.2		15.60	470.4		20.60	465.4	
4/29/2008	468.60		32.20	455.5		37.00	450.7		15.40	470.6		20.00	466.0	
5/29/2008	464.70		33.90	453.8		37.40	450.3		15.50	470.5		20.30	465.7	
6/26/2008	455.70		34.70	453.0		37.60	450.1		15.40	470.6		20.20	465.8	
7/29/2008	447.30	0.00	35.40	452.3		38.20	449.5		15.60	470.4		20.20	465.8	
8/28/2008	438.80	0.00	35.80	451.9		38.40	449.3		15.90	470.1		20.30	465.7	
9/26/2008	430.70	0.00	36.00	451.7		38.30	449.4		15.90	470.1		20.30	465.7	
10/29/2008	412.50	0.00	36.30	451.4		38.30	449.4		16.00	470.0		20.20	465.8	
11/25/2008	404.70	2.60	36.00	451.7		38.30	449.4		16.10	469.9		20.20	465.8	
12/30/2008	440.90	3.42	33.60	454.1		37.90	449.8		15.90	470.1		20.40	465.6	
1/28/2009	463.70	0.17	30.80	456.9		37.00	450.7		15.30	470.7		20.10	465.9	
2/25/2009	470.10	3.35	30.20	457.5		36.00	451.7		14.90	471.1		19.00	467.0	
3/26/2009	469.40	0.19	30.70	457.0		36.20	451.5		14.60	471.4		19.50	466.5	
4/29/2009	466.90	0.07	31.30	456.4		36.60	451.1		14.60	471.4		19.70	466.3	
5/18/2009	466.70	0.00	31.20	456.5		36.60	451.1		14.40	471.6		19.40	466.6	
5/29/2009	465.00	0.00	31.50	456.2		36.60	451.1		14.40	471.6		19.40	466.6	
6/30/2009	460.20	0.00	32.10	455.6		37.10	450.6		14.50	471.5		19.30	466.7	
7/30/2009	451.10	0.00	32.70	455.0		37.30	450.4		14.50	471.5		19.30	466.7	
8/25/2009	440.10	0.00	33.20	454.5		37.40	450.3		14.50	471.5		19.20	466.8	
9/30/2009	432.20	0.00	33.15	454.6		37.60	450.1		14.60	471.4		19.30	466.7	
10/29/2009	431.40	0.53	32.74	455.0		37.62	450.0		14.69	471.3		19.48	466.5	
12/1/2009	427.40	0.00	32.60	455.1		37.70	450.0		14.90	471.1		19.80	466.2	
12/29/2009	448.10	2.06	30.66	457.0		37.31	450.3		14.72	471.3		19.65	466.4	
1/27/2010	465.60	4.62	27.40	460.3		36.60	451.1		14.20	471.8		19.40	466.6	
2/25/2010	470.20	2.51	27.70	460.0		36.10	451.6		13.80	472.2		19.20	466.8	
3/29/2010	465.70	0.99	29.40	458.3		36.50	451.2		13.70	472.3		18.00	468.0	
4/4/2010	465.00		29.20	458.5		36.40	451.3		13.70	472.3		18.40	467.6	
4/27/2010	468.40	1.23	28.60	459.1		36.20	451.5		13.60	472.4		18.90	467.1	
5/27/2010	463.30	0.05	29.80	457.9		36.40	451.3		13.60	472.4		18.80	467.2	
6/30/2010	454.70	0.00	30.50	457.2		36.70	451.0		13.60	472.4		18.70	467.3	
7/28/2010	445.60	0.00	31.00	456.7		37.00	450.7		13.70	472.3		18.90	467.1	
8/31/2010	437.10	0.00	31.30	456.4		37.20	450.5		14.00	472.0		19.00	467.0	
9/29/2010	422.70	0.00	31.30	456.4		37.20	450.5		13.80	472.2		18.90	467.1	
10/27/2010	426.40	2.38	31.20	456.5		37.20	450.5		13.90	472.1		19.00	467.0	
11/29/2010	439.80	0.97	30.00	457.7		37.10	450.6		13.70	472.3		19.20	466.8	
12/30/2010	456.60	8.62	25.70	462.0		35.50	452.2		12.60	473.4		18.20	467.8	

Note:
Elevations are in feet relative to NAVD88 datum.

**TABLE 1
SAN JOAQUIN DAM
PIEZOMETER AND MONITORING WELL WATER LEVEL MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017**

Monitoring Well ----->			CP-2A			CP-2B			CP-3A			CP-3B		
Top of Well Elevation ----->			487.7			487.7			486.0			486.0		
Well Bottom Elevation -->														
Date	Reservoir Elevation (feet)	Monthly Rainfall (inches)	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment
2/1/2011	468.90	0.92	26.00	461.7		35.30	452.4		11.90	474.1		17.90	468.1	
2/23/2011	469.00	0.99	26.48	461.2		35.58	452.1		11.64	474.4		17.81	468.2	
3/29/2011	470.30	2.93	26.50	461.2		35.40	452.3		11.10	474.9		17.40	468.6	
4/27/2011	464.80	0.19	27.87	459.8		35.67	452.0		10.85	475.2		17.00	469.0	
5/26/2011	457.30	0.48	28.60	459.1		36.00	451.7		10.80	475.2		16.90	469.1	
6/28/2011	443.50	0.05	29.80	457.9		36.30	451.4		10.70	475.3		16.70	469.3	
7/29/2011	425.10	0.00	30.35	457.4		36.60	451.1		10.80	475.2		16.70	469.3	
8/24/2011	418.00	0.00	30.60	457.1		36.70	451.0		10.80	475.2		16.70	469.3	
9/27/2011	400.90	0.12	30.60	457.1		36.70	451.0		11.00	475.0		16.70	469.3	
10/26/2011	402.20	1.25	30.80	456.9		36.90	450.8		11.10	474.9		17.20	468.8	
11/30/2011	425.10	1.38	29.50	458.2		36.40	451.3		10.80	475.2		16.70	469.3	
12/21/2011	435.70	0.32	29.10	458.6		36.60	451.1		10.90	475.1		16.90	469.1	
1/24/2012	441.40	0.53	28.50	459.2		36.40	451.3		10.50	475.5		17.00	469.0	
2/28/2012	448.40	0.42	28.50	459.2		36.60	451.1		10.60	475.4		17.40	468.6	
3/26/2012	452.70	1.06	27.80	459.9		36.60	451.1		10.50	475.5		17.30	468.7	
4/23/2012	463.40	1.32	26.70	461.0		35.70	452.0		10.50	475.5		17.40	468.6	
5/30/2012	457.30	0.02	28.30	459.4		36.00	451.7		10.40	475.6		17.10	468.9	
6/13/2012	452.90	0.02	28.80	458.9		36.00	451.7		10.50	475.5		17.00	469.0	
6/26/2012	450.20	0.00	29.10	458.6		36.10	451.6		10.60	475.4		17.10	468.9	
7/24/2012	439.80	0.00	30.00	457.7		36.70	451.0		11.00	475.0		17.80	468.2	
8/8/2012	437.60	0.12	29.80	457.9		36.60	451.1		11.10	474.9		17.50	468.5	
8/22/2012	433.40	0.00	29.95	457.8		36.50	451.2		11.15	474.9		17.55	468.5	
8/29/2012	431.30	0.00	30.00	457.7		36.40	451.3		11.20	474.8		17.50	468.5	
9/25/2012	420.80	0.00	30.10	457.6		36.40	451.3		11.30	474.7		17.60	468.4	
10/31/2012	412.30	0.26	30.60	457.1		36.80	450.9		11.80	474.2		18.10	467.9	
11/27/2012	420.80	0.58	30.30	457.4		36.80	450.9		11.80	474.2		18.20	467.8	
12/18/2012	448.00	1.44	27.90	459.8		36.00	451.7		11.65	474.4		18.00	468.0	
1/29/2013	468.60	1.18	26.20	461.5		35.80	451.9		11.30	474.7		18.30	467.7	
2/28/2013	469.20	0.30	26.90	460.8		35.50	452.2		11.20	474.8		18.20	467.8	
3/27/2013	468.30	0.50	27.50	460.2		35.40	452.3		11.20	474.8		18.00	468.0	
4/25/2013	462.70	0.00	28.90	458.8		35.80	451.9		11.40	474.6		18.20	467.8	
5/21/2013	454.20	0.00	29.70	458.0		36.20	451.5		11.90	474.1		18.40	467.6	
6/25/2013	439.30	0.00	30.60	457.1		36.50	451.2		12.00	474.0		18.65	467.4	
7/23/2013	431.50	0.00	30.70	457.0		36.70	451.0		12.40	473.6		18.80	467.2	
8/21/2013	418.00	0.00	31.30	456.4		36.80	450.9		13.00	473.0		19.10	466.9	
9/24/2013	404.00	0.00	31.20	456.5		36.90	450.8		13.00	473.0		19.20	466.8	
10/29/2013	400.60	0.00	31.00	456.7		36.70	451.0		13.10	472.9		19.40	466.6	
11/26/2013	407.90	0.44	30.90	456.8		37.00	450.7		13.20	472.8		19.50	466.5	
12/19/2013	425.80	0.54	29.90	457.8		36.50	451.2		12.90	473.1		19.20	466.8	

Note:
Elevations are in feet relative to NAVD88 datum.

**TABLE 1
SAN JOAQUIN DAM
PIEZOMETER AND MONITORING WELL WATER LEVEL MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017**

Monitoring Well ----->			CP-2A			CP-2B			CP-3A			CP-3B		
Top of Well Elevation ----->			487.7			487.7			486.0			486.0		
Well Bottom Elevation -->														
Date	Reservoir Elevation (feet)	Monthly Rainfall (inches)	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment
1/28/2014	439.70	0.00	29.00	458.7		36.50	451.2		12.70	473.3		19.50	466.5	
2/25/2014	449.70	0.83	28.25	459.5		36.20	451.5		12.70	473.3		19.60	466.4	
3/26/2014	465.10		26.75	461.0		35.70	452.0		12.55	473.5		19.60	466.4	
3/28/2014	465.70	1.15	26.80	460.9		35.80	451.9		12.60	473.4		19.70	466.3	
4/29/2014	465.30	0.43	27.60	460.1		35.80	451.9		12.80	473.2		19.60	466.4	
5/28/2014	450.60	0.00	29.80	457.9		36.30	451.4		13.10	472.9		19.60	466.4	
6/25/2014	440.10	0.00	30.40	457.3		36.50	451.2		13.20	472.8		19.80	466.2	
7/29/2014	431.20	0.00	30.70	457.0		36.70	451.0		13.50	472.5		20.10	465.9	
8/26/2014	419.50	0.02	31.10	456.6		36.80	450.9		13.70	472.3		20.30	465.7	
9/23/2014	405.30	0.00	31.30	456.4		36.80	450.9		13.80	472.2		20.20	465.8	
10/29/2014	400.90	0.00	31.30	456.4		36.90	450.8		14.10	471.9		20.50	465.5	
11/25/2014	410.90	0.25	31.20	456.5		37.10	450.6		14.30	471.7		20.90	465.1	
12/30/2014	430.60	2.94	26.20	461.5		36.65	451.0		14.00	472.0		20.50	465.5	
1/27/2015	466.70	0.83	26.50	461.2		35.70	452.0		13.10	472.9		20.30	465.7	
2/25/2015	468.90	0.69	27.00	460.7		35.50	452.2		12.70	473.3		20.10	465.9	
3/26/2015	465.90	0.61	28.10	459.6		35.60	452.1		12.70	473.3		19.90	466.1	
4/28/2015	465.70	0.20	28.00	459.7		35.70	452.0		12.80	473.2		19.80	466.2	
5/28/2015	466.40	1.08	20.10	467.6		35.70	452.0		12.90	473.1		20.00	466.0	
6/30/2015	454.50	0.00	29.80	457.9		36.10	451.6		13.10	472.9		20.00	466.0	
7/28/2015	445.60	0.00	30.20	457.5		36.30	451.4		13.30	472.7		20.10	465.9	
8/28/2015	437.60	0.00	30.50	457.2		36.60	451.1		13.60	472.4		20.20	465.8	
9/24/2015	426.90	1.51	30.80	456.9		36.70	451.0		13.80	472.2		20.50	465.5	
10/27/2015	415.40	0.49	30.90	456.8		36.80	450.9		14.10	471.9		20.70	465.3	
11/19/2015	412.90	0.09	30.80	456.9		36.80	450.9		14.20	471.8		20.80	465.2	
12/22/2015	425.50	0.69	29.90	457.8		36.50	451.2		14.40	471.6		20.80	465.2	
1/27/2016	463.60	2.86	26.25	461.5		36.15	451.5		14.10	471.9		21.10	464.9	
2/25/2016	468.90	0.25	26.70	461.0		35.50	452.2		14.20	471.8		20.90	465.1	
3/30/2016	468.00	1.44	26.75	461.0		35.10	452.6		13.60	472.4		20.80	465.2	
4/28/2016	461.30	0.30	28.20	459.5		35.70	452.0		13.80	472.2		20.80	465.2	
5/25/2016	451.30	0.18	29.05	458.7		36.20	451.5		14.15	471.9		21.05	465.0	
6/28/2016	414.10	0.00	29.30	458.4		36.20	451.5		14.40	471.6		21.10	464.9	
7/27/2016	434.20	0.00	29.70	458.0		36.40	451.3		14.60	471.4		21.30	464.7	
8/23/2016	418.60	0.00	30.30	457.4		36.65	451.0		14.90	471.1		21.40	464.6	
9/27/2016	406.40	0.00	30.40	457.3		36.70	451.0		15.20	470.8		21.50	464.5	
10/26/2016	404.00	0.17	30.30	457.4		36.70	451.0		15.50	470.5		21.80	464.2	
11/22/2016	413.60	1.13	29.95	457.8		36.80	450.9		15.45	470.6		21.95	464.1	
12/20/2016	441.10	3.48	28.10	459.6		36.45	451.2		15.35	470.7		22.05	464.0	

Note:
Elevations are in feet relative to NAVD88 datum.

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SAN JOAQUIN DAM
PIEZOMETER AND MONITORING WELL WATER LEVEL MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017**

Monitoring Well ----->			CP-2A			CP-2B			CP-3A			CP-3B		
Top of Well Elevation ----->			487.7			487.7			486.0			486.0		
Well Bottom Elevation -->														
Date	Reservoir Elevation (feet)	Monthly Rainfall (inches)	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment	read. (feet)	elev. (feet)	comment
1/26/2017	471.60	5.67	24.10	463.6		35.20	452.5		14.20	471.8		21.70	464.3	
2/24/2017	472.05	3.13	24.80	462.9		34.60	453.1		13.65	472.4		21.10	464.9	
2/25/2017	472.00		24.80	462.9		34.45	453.2		13.55	472.5		21.00	465.0	
2/26/2017	472.00		24.85	462.9		34.40	453.3		13.50	472.5		20.90	465.1	
2/27/2017	472.00		25.40	462.3		34.40	453.3		13.90	472.1		20.40	465.6	
2/28/2017	471.90		24.90	462.8		34.50	453.2		13.50	472.5		21.00	465.0	
3/1/2017	471.90		24.90	462.8		34.40	453.3		13.60	472.4		21.20	464.8	
3/2/2017	471.90		25.14	462.6		34.70	453.0		13.60	472.4		21.10	464.9	
3/29/2017	467.90	0.10	26.30	461.4		35.00	452.7		13.40	472.6		20.70	465.3	
4/27/2017	457.60	0.04	27.60	460.1		35.70	452.0		13.30	472.7		20.30	465.7	
5/23/2017	453.50	0.43	27.80	459.9		35.90	451.8		13.40	472.6		20.50	465.5	
6/21/2017	447.40	0.00	28.10	459.6		35.90	451.8		13.30	472.7		20.40	465.6	
7/26/2017	435.10	0.00	28.70	459.0		36.20	451.5		13.50	472.5		20.50	465.5	
8/25/2017	420.10	0.00	28.00	459.7		36.20	451.5		13.60	472.4		20.40	465.6	
9/27/2017	407.10	0.00	29.10	458.6		36.40	451.3		13.80	472.2		20.60	465.4	
10/26/2017	395.00	0.00	29.20	458.5		36.30	451.4		14.10	471.9		20.60	465.4	
11/28/2017	409.00	0.09	28.60	459.1		36.30	451.4		13.70	472.3		20.70	465.3	
12/20/2017	416.80	0.00	28.50	459.2		36.40	451.3		13.80	472.2		20.90	465.1	
1/24/2018	434.50	1.31	27.10	460.6		36.00	451.7		13.30	472.7		20.50	465.5	

Note:
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**TABLE 2
SAN JOAQUIN DAM
VIBRATING WIRE PIEZOMETER MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017**

Vibrating Wire Piezo. ----->			VB-1			VB-2			VB-3			VB-4		
Top of AC Elevation ----->			371.0			407.0			421.5			448.0		
Piezo. Tip Elevation ----->			357.0			392.0			399.5			441.0		
Date	Reservoir Elevation (feet)	comments	read. (ft)	temp. (°C)	elevation (ft)	read. (Hz)	temp. (°C)	elevation (ft)	read. (Hz)	temp. (°C)	elevation (ft)	read. (Hz)	temp. (°C)	elevation (ft)
1/3/2008	443.20		3004.50	22.30	392.04	2994.10	23.0	410.09	3163.00	21.60	398.37	3083.30	21.70	438.77
1/29/2008	452.20		3032.10	20.80	385.04	2967.30	23.0	416.07	3162.70	21.60	398.45	3058.40	21.00	444.72
2/27/2008	460.80		3016.60	22.30	389.00	2941.00	23.0	421.91	3163.10	21.40	398.34	3016.10	20.90	454.77
3/26/2008	468.00		3083.50	22.30	371.98	2918.80	23.0	426.80	3163.10	21.20	398.34	2480.10	20.80	569.87
4/29/2008	468.60		3005.20	22.30	391.87	2908.00	23.0	429.16	3163.90	21.00	398.11	2974.80	20.40	464.42
5/29/2008	464.70		3003.80	22.30	392.22	2910.90	23.0	428.53	3163.30	19.70	398.24	2990.00	19.50	460.84
6/26/2008	455.70		3007.50	19.80	391.20	2924.80	23.0	425.48	3163.60	20.60	398.18	3022.60	20.70	453.23
7/29/2008	447.30		3013.80	19.00	389.59	2943.30	23.0	421.40	3163.20	20.60	398.29	3051.20	21.20	446.45
8/28/2008	438.80		3020.30	22.30	388.07	2960.80	23.0	417.52	3164.20	20.60	398.02	3062.90	24.50	443.81
9/26/2008	430.70		3026.00	22.30	386.64	2975.90	23.0	414.16	3163.50	20.90	398.22	3067.40	22.80	442.65
10/29/2008	412.50		3041.50	22.30	382.71	3007.20	23.0	407.15	3163.20	21.10	398.31	3071.10	23.30	441.78
11/25/2008	404.70		3051.80	22.30	380.10	3024.60	23.0	403.22	3163.10	21.20	398.34	3073.50	22.80	441.18
12/30/2008	440.90		3037.00	22.30	383.86	3008.40	23.0	406.88	3163.30	21.40	398.29	3078.50	21.50	439.92
1/28/2009	463.70		3010.10	22.30	390.64	2951.70	23.0	419.54	3162.40	21.40	398.53	3003.20	21.20	457.82
2/25/2009	470.10		2988.80	22.30	395.96	2912.40	23.0	428.20	3162.90	21.30	398.39	2965.70	20.80	466.56
3/26/2009	469.40		2973.50	22.30	399.76	2903.20	23.0	430.21	3163.70	21.10	398.17	2967.20	20.50	466.19
4/29/2009	466.90		2938.80	22.30	408.30	2903.10	23.0	430.24	3163.10	20.90	398.33	2975.50	20.60	464.27
5/18/2009	466.70		2938.00	19.90	408.41	2904.00	23.0	430.04	3163.00	20.80	398.35	2977.00	20.60	463.92
5/29/2009	465.00		2941.80	22.30	407.57	2907.10	23.0	429.36	3163.60	20.80	398.19	2987.80	20.70	461.41
6/30/2009	460.20		2947.30	22.30	406.22	2914.70	23.0	427.70	3163.80	20.70	398.13	3004.30	20.80	457.54
7/30/2009	451.10		2960.50	20.00	402.89	2929.70	23.0	424.40	3163.60	20.60	398.18	3034.00	21.30	450.55
8/25/2009	440.10		2979.90	19.80	398.08	2950.40	23.0	419.83	3163.50	20.70	398.21	3056.30	21.60	445.25
9/30/2009	432.20		2996.20	22.30	394.12	2970.30	23.0	415.41	3163.80	20.80	398.14	3063.20	22.70	443.65
10/29/2009	431.40		3003.20	20.10	392.29	2979.70	23.0	413.31	3163.40	21.00	398.25	3067.90	22.70	442.52
12/1/2009	427.40		3014.10	20.90	389.58	2990.70	23.0	410.85	3163.60	21.20	398.20	3072.10	23.90	441.57
12/29/2009	448.10		3000.70	22.30	392.99	2971.40	23.0	415.16	3163.30	21.30	398.28	3069.10	21.50	442.18
1/27/2010	465.60		2978.90	22.30	398.42	2927.90	23.0	424.79	3163.90	21.30	398.12	2989.70	21.00	460.98
2/25/2010	470.20		2957.30	22.30	403.76	2899.70	23.0	430.98	3162.80	21.20	398.42	2961.30	20.60	467.57
3/29/2010	465.70		2963.60	20.10	402.13	2901.20	23.0	430.65	3163.50	21.00	398.22	2977.80	20.40	463.73
4/4/2010	465.00		2965.40	22.30	401.76	2902.50	23.0	430.37	3163.40	20.90	398.25	2980.60	20.40	463.07
4/27/2010	468.40		2964.60	22.30	401.96	2899.00	23.0	431.13	3163.50	22.6	398.27	2968.40	22.2	465.99
5/27/2010	463.30		2972.00	22.30	400.13	2903.00	23.0	430.26	3163.00	20.60	398.35	2986.00	20.30	461.81
6/30/2010	454.70		2988.10	22.30	396.14	2923.60	23.0	425.74	3163.50	20.50	398.21	3028.10	20.60	451.92
7/28/2010	445.60		2996.90	20.00	393.86	2936.90	23.0	422.81	3163.30	20.50	398.26	3045.70	21.00	447.76
8/31/2010	437.10		3008.70	22.30	390.99	2957.90	23.0	418.16	3163.50	20.60	398.21	3057.70	21.80	444.93
9/29/2010	422.70		3024.50	22.30	387.01	2983.40	23.0	412.48	3163.80	20.70	398.13	3062.10	21.80	443.87
10/27/2010	426.40		3027.60	22.30	386.23	2995.00	23.0	409.89	3163.40	20.80	398.24	3067.00	21.80	442.70
11/29/2010	439.80		3021.40	22.30	387.80	2982.50	23.0	412.68	3162.20	20.90	398.57	3068.60	21.70	442.31
12/30/2010	456.60		3003.30	22.30	392.34	2948.30	23.0	420.29	3164.10	21.00	398.06	3032.30	21.00	450.94

Notes:

- (1) Elevations are in feet relative to NAVD88 datum.
- (2) Temperature values listed in red are adjusted for temperature reading errors.

**TABLE 2
SAN JOAQUIN DAM
VIBRATING WIRE PIEZOMETER MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017**

Vibrating Wire Piezo. ----->			VB-1			VB-2			VB-3			VB-4		
Top of AC Elevation ----->			371.0			407.0			421.5			448.0		
Piezo. Tip Elevation ----->			357.0			392.0			399.5			441.0		
Date	Reservoir Elevation (feet)	comments	read. (ft)	temp. (°C)	elevation (ft)	read. (Hz)	temp. (°C)	elevation (ft)	read. (Hz)	temp. (°C)	elevation (ft)	read. (Hz)	temp. (°C)	elevation (ft)
2/1/2011	468.90		2964.00	22.30	402.11	2903.00	23.0	430.26	3163.00	21.00	398.36	2968.00	20.50	466.01
2/23/2011	469.00		2960.70	22.30	402.92	2896.00	23.0	431.79	3162.80	20.90	398.41	2964.10	20.10	466.90
3/29/2011	470.30		2959.90	22.30	403.12	2891.90	23.0	432.68	3162.90	20.70	398.37	2957.70	20.60	468.40
4/27/2011	464.80		2967.20	19.60	401.22	2897.80	23.0	431.40	3163.10	20.50	398.32	2979.30	19.80	463.35
5/26/2011	457.30		2983.40	19.60	397.21	2911.70	23.0	428.35	3162.80	20.30	398.39	3007.40	20.20	456.79
6/28/2011	443.50		3003.20	22.30	392.37	2935.90	23.0	423.03	3163.60	20.20	398.17	3045.90	20.40	447.68
7/29/2011	425.10		3020.90	22.30	387.92	2965.90	23.0	416.38	3163.10	20.20	398.31	3055.70	21.30	445.38
8/24/2011	418.00		3037.00	19.90	383.77	2996.50	23.0	409.55	3163.40	20.30	398.23	3059.30	22.30	444.57
9/27/2011	400.90		3051.00	20.10	380.22	3021.30	23.0	403.97	3163.10	20.50	398.32	3064.10	23.60	443.48
10/26/2011	402.20		3054.30	22.30	379.46	3031.70	23.0	401.62	3163.40	20.80	398.24	3066.60	21.10	442.76
11/30/2011	425.10		3044.00	22.30	382.08	3023.20	23.0	403.54	3163.60	20.90	398.19	3068.80	21.60	442.26
12/21/2011	435.70		3037.90	22.30	383.63	3009.50	23.0	406.63	3163.00	21.00	398.36	3071.70	21.20	441.54
1/24/2012	441.40		3033.00	22.30	384.87	2985.60	23.0	411.99	3162.70	21.10	398.44	3071.10	21.00	441.68
2/28/2012	448.40		3024.00	22.30	387.14	2957.40	23.0	418.27	3162.70	20.80	398.43	3053.20	20.60	445.95
3/26/2012	452.70		3020.60	22.30	388.00	2947.20	23.0	420.53	3162.50	20.70	398.48	3042.10	20.40	448.59
4/23/2012	463.40		2997.40	22.30	393.82	2919.70	23.0	426.60	3162.80	20.40	398.39	2991.30	20.00	460.56
5/30/2012	457.30		2993.10	22.30	394.89	2915.50	23.0	427.52	3162.60	20.30	398.44	3009.00	20.40	456.42
6/13/2012	452.90		2990.80	22.30	395.46	2992.90	23.0	410.36	3163.40	20.30	398.23	3022.80	20.40	453.16
6/26/2012	450.20		3001.00	22.30	392.92	2928.70	23.0	424.62	3163.10	20.20	398.31	3031.80	20.60	451.04
7/24/2012	439.80		3013.40	22.30	389.81	2947.10	23.0	420.56	3162.60	21.10	398.47	3050.90	21.10	446.52
8/8/2012	437.60		3016.90	22.30	388.93	2954.90	23.0	418.83	3163.10	21.10	398.33	3051.90	21.90	446.32
8/22/2012	433.40		3021.00	22.30	387.90	2963.10	23.0	417.01	3162.90	20.30	398.36	3056.50	24.10	445.32
8/29/2012	431.30		3023.40	22.30	387.29	2967.60	23.0	416.01	3163.30	20.30	398.26	3058.20	24.20	444.92
9/25/2012	420.80		3025.20	22.30	386.84	2971.50	23.0	415.14	3163.60	20.90	398.19	3062.20	21.60	443.84
10/31/2012	412.30		3042.30	22.30	382.51	3006.10	23.0	407.39	3162.30	20.70	398.54	3066.70	25.90	442.96
11/27/2012	420.80		3041.20	22.30	382.79	3010.60	23.0	406.38	3161.80	22.70	398.73	3070.00	22.80	442.02
12/18/2012	448.00		3025.00	22.30	386.89	2985.80	23.0	411.95	3162.70	21.10	398.44	3068.10	20.40	442.37
1/29/2013	468.60		2956.00	-51.10	401.40	2909.30	-50.8	427.96	3161.70	21.10	398.71	2966.90	20.70	466.27
2/28/2013	469.20		2943.50	-51.10	404.47	2893.60	-50.8	431.39	3162.30	21.10	398.55	2960.20	19.90	467.79
3/27/2013	468.30		2944.50	-51.20	404.22	2891.40	-50.9	431.87	3162.40	21.00	398.52	2963.50	19.90	467.03
4/25/2013	462.70		2960.30	-51.20	400.34	2894.70	-50.6	431.15	3162.20	20.80	398.57	2981.10	19.60	462.92
5/21/2013	454.20		2982.70	-50.70	394.82	2909.30	-50.5	427.96	3162.40	20.30	398.50	3016.70	20.20	454.60
6/25/2013	439.30		3008.30	-51.00	388.42	2936.10	-50.5	422.07	3162.20	20.40	398.55	3053.00	21.10	446.02
7/23/2013	431.50		3018.50	-51.30	385.84	2951.40	-51.0	418.68	3162.00	20.40	398.61	3057.70	21.80	444.93
8/21/2013	418.00		3032.20	-51.00	382.40	2973.60	-50.9	413.75	3162.30	20.50	398.53	3060.90	22.90	444.21
9/24/2013	404.00		3047.20	-51.00	378.59	2997.00	-50.9	408.52	3162.50	20.70	398.48	3064.50	23.60	443.38
10/29/2013	400.60		3052.30	-51.10	377.29	3005.50	-50.8	406.61	3162.10	21.00	398.60	3069.00	25.10	442.37
11/26/2013	407.90		wires unplugged for repair			3010.30	-50.4	405.53	3161.50	21.20	398.77	3072.60	22.20	441.37
12/19/2013	425.80		wires unplugged for repair			3007.70	-51.0	406.11	3162.90	22.30	398.42	3075.30	22.40	440.73

Notes:

- (1) Elevations are in feet relative to NAVD88 datum.
- (2) Temperature values listed in red are adjusted for temperature reading errors.

**TABLE 2
SAN JOAQUIN DAM
VIBRATING WIRE PIEZOMETER MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017**

Vibrating Wire Piezo. ----->		VB-1			VB-2			VB-3			VB-4			
Top of AC Elevation ----->		371.0			407.0			421.5			448.0			
Piezo. Tip Elevation ----->		357.0			392.0			399.5			441.0			
Date	Reservoir Elevation (feet)	comments	read. (ft)	temp. (°C)	elevation (ft)	read. (Hz)	temp. (°C)	elevation (ft)	read. (Hz)	temp. (°C)	elevation (ft)	read. (Hz)	temp. (°C)	elevation (ft)
1/28/2014	439.70		3035.60	20.50	384.14	2970.70	20.8	415.29	3161.80	20.80	398.67	3074.00	21.10	440.99
2/25/2014	449.70		3027.90	20.30	386.08	2944.10	20.4	421.19	3162.00	20.70	398.62	3058.30	20.80	444.74
3/26/2014	465.10		2989.60	20.10	395.68	2898.30	20.3	431.25	3161.80	20.40	398.66	2984.10	20.50	462.26
3/28/2014	465.70		2985.70	20.30	396.66	2894.60	20.3	432.06	3161.20	20.40	398.82	2980.00	20.50	463.22
4/29/2014	465.30		2972.90	20.00	399.83	2878.70	20.1	435.52	3161.90	20.30	398.63	2977.00	20.50	463.92
5/28/2014	450.60		3001.50	20.00	392.71	2900.40	20.1	430.79	3162.00	20.20	398.60	3030.60	20.40	451.32
6/25/2014	440.10		3015.30	20.10	389.25	2921.90	20.2	426.08	3162.00	20.30	398.61	3052.60	20.70	446.10
7/29/2014	431.20		3024.20	20.30	387.02	2942.30	20.5	421.59	3161.50	20.50	398.75	3058.40	21.60	444.75
8/26/2014	419.50		3034.00	20.70	384.56	2964.10	20.8	416.76	3161.80	20.90	398.68	3061.80	26.40	444.16
9/23/2014	405.30		3046.60	20.80	381.36	2988.60	21.6	411.30	3161.60	21.00	398.73	3064.50	27.60	443.56
10/29/2014	400.90		3052.40	21.30	379.91	3001.90	21.5	408.32	3161.50	21.50	398.77	3070.50	27.30	442.11
11/25/2014	410.90		3050.00	21.50	380.52	3007.00	21.7	407.18	3160.20	21.80	399.13	3074.80	22.40	440.85
12/30/2014	430.60		3039.70	22.60	383.18	2997.90	22.9	409.23	3161.60	23.40	398.80	3078.60	24.50	440.03
1/27/2015	466.70		3006.70	21.30	391.45	2913.00	21.5	428.05	3161.10	21.60	398.88	2978.20	21.70	463.69
2/25/2015	468.90		2998.80	21.10	393.42	2878.80	21.2	435.51	3160.90	21.40	398.93	2963.50	21.40	467.09
3/26/2015	465.90		2988.70	21.00	395.94	2874.00	21.1	436.55	3161.10	21.30	398.88	2974.10	21.30	464.63
4/28/2015	465.70		2995.50	20.70	394.23	2874.30	21.1	436.49	3161.60	21.50	398.75	2976.20	21.40	464.14
5/28/2015	466.40		2996.10	21.30	394.11	2871.30	21.5	437.14	3161.40	21.50	398.80	2973.70	21.50	464.73
6/30/2015	454.50		3005.00	20.70	391.86	2889.10	21.1	433.27	3161.60	21.30	398.74	3017.10	22.20	454.59
7/28/2015	445.60		3012.70	20.80	389.93	2910.80	21.0	428.53	3161.40	21.10	398.79	3047.50	21.70	447.36
8/28/2015	437.60		3018.60	21.80	388.48	2928.90	21.7	424.56	3161.10	21.60	398.88	3057.60	21.90	444.96
9/24/2015	426.90		3027.00	22.80	386.40	2951.00	23.2	419.69	3161.00	23.50	398.96	3061.00	25.60	444.31
10/27/2015	415.40		3036.60	21.70	383.93	2974.20	21.8	414.52	3161.30	21.80	398.84	3086.60	27.60	438.24
11/19/2015	412.90		3040.70	21.90	382.90	2986.30	22.0	411.82	3160.50	22.00	399.06	3090.70	22.50	437.02
12/22/2015	425.50		3038.60	21.80	383.43	2987.07	22.8	411.66	3161.68	21.90	398.74	3094.29	23.70	436.21
1/27/2016	463.60		3017.96	21.40	388.63	2931.15	21.8	424.06	3160.29	21.90	399.11	3018.88	21.50	454.14
2/25/2016	468.90		3009.78	21.10	390.67	2885.40	21.4	434.08	3160.87	21.90	398.95	2985.15	20.80	462.03
3/30/2016	468.00		3005.78	20.80	391.67	2870.78	21.0	437.25	3161.26	21.60	398.84	2984.84	20.70	462.10
4/28/2016	461.30		3007.99	20.70	391.11	2878.68	20.9	435.53	3161.56	21.50	398.76	3012.59	20.80	455.59
5/25/2016	451.30		3013.12	20.60	389.82	2898.47	20.8	431.22	3160.43	21.30	399.06	3049.04	21.20	446.97
6/28/2016	414.10		3017.70	20.60	388.67	2917.70	20.8	427.01	3161.03	21.20	398.89	3070.88	22.30	441.79
7/27/2016	434.20	10 day hold from 7/11/16 to 7/21/16 @ 438'	3024.70	20.70	386.91	2936.50	21.0	422.87	3160.80	21.20	398.95	3078.30	24.90	440.12
8/23/2016	418.60	5 day hold from 8/23/16 to 8/28/16	3035.41	20.80	384.20	2964.24	21.3	416.73	3160.65	21.20	398.99	3082.53	26.40	439.17
9/27/2016	406.40	10 day hold from 9/30/2016 to 10/10/2016	3047.11	21.10	381.25	2990.48	21.8	410.88	3160.63	21.40	399.00	3087.44	26.50	437.99
10/26/2016	404.00		3051.02	21.40	380.26	3003.23	22.1	408.03	3160.50	21.60	399.05	3090.40	26.40	437.27
11/22/2016	413.60		3048.07	21.50	381.02	3006.57	22.3	407.28	3160.67	21.80	399.01	3092.04	25.70	436.84
12/20/2016	441.10		3033.41	21.50	384.73	2981.77	22.3	412.84	3159.80	22.00	399.24	3093.59	23.50	436.37

Notes:

- (1) Elevations are in feet relative to NAVD88 datum.
- (2) Temperature values listed in red are adjusted for temperature reading errors.

**TABLE 2
SAN JOAQUIN DAM
VIBRATING WIRE PIEZOMETER MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017**

Vibrating Wire Piezo. ----->			VB-1			VB-2			VB-3			VB-4		
Top of AC Elevation ----->			371.0			407.0			421.5			448.0		
Piezo. Tip Elevation ----->			357.0			392.0			399.5			441.0		
Date	Reservoir Elevation (feet)	comments	read. (ft)	temp. (°C)	elevation (ft)	read. (Hz)	temp. (°C)	elevation (ft)	read. (Hz)	temp. (°C)	elevation (ft)	read. (Hz)	temp. (°C)	elevation (ft)
1/26/2017	471.60		3011.61	21.30	390.22	2900.67	22.0	430.76	3159.30	22.00	399.38	2976.99	21.80	463.98
2/24/2017	472.05		3007.20	21.10	391.32	2872.81	21.6	436.82	3160.02	22.00	399.19	2971.88	20.70	465.12
2/25/2017	472.00		3007.04	21.10	391.36	2872.45	21.7	436.90	3159.68	21.90	399.27	2971.58	20.70	465.19
2/26/2017	472.00		3007.17	21.10	391.33	2872.02	21.6	436.99	3160.09	21.90	399.16	2971.99	20.70	465.09
2/27/2017	472.00		3007.06	21.10	391.36	2872.13	21.6	436.96	3160.10	21.90	399.16	2971.99	20.07	465.06
2/28/2017	471.90		3007.02	21.10	391.37	2871.54	21.6	437.09	3160.84	21.90	398.96	2972.98	20.60	464.86
3/1/2017	471.90		3007.11	21.10	391.34	2871.54	21.6	437.09	3160.24	21.90	399.12	2971.86	20.07	465.09
3/2/2017	471.90		3006.69	21.10	391.45	2870.57	21.6	437.30	3159.45	21.90	399.34	2971.67	20.50	465.16
3/29/2017	467.90		3007.03	20.80	391.35	2871.74	21.2	437.04	3160.28	21.80	399.11	2987.31	20.10	461.49
4/27/2017	457.60		3011.00	20.60	390.35	2888.70	20.9	433.35	3160.50	21.50	399.04	3026.10	20.30	452.38
5/23/2017	453.50		3013.77	20.50	389.65	2901.51	20.8	430.56	3160.48	21.40	399.04	3117.73	20.90	430.38
6/21/2017	447.40		3016.94	20.50	388.85	2913.05	20.8	428.03	3161.03	21.30	398.89	3063.65	21.60	443.49
7/26/2017	435.10		3024.22	20.60	387.02	2937.66	21.0	422.62	3159.94	21.20	399.18	3078.88	24.30	439.96
8/25/2017	420.10		3035.09	20.70	384.28	2966.31	21.3	416.27	3160.80	21.20	398.95	3083.07	25.80	439.01
9/27/2017	407.10		3044.81	21.00	381.83	2988.98	21.7	411.22	3161.46	21.40	398.78	3088.29	26.60	437.79
10/26/2017	395.00		3058.99	21.30	378.23	3004.20	22.0	407.81	3161.31	21.60	398.83	3090.24	26.30	437.31
11/28/2017	409.00		3053.41	21.50	379.66	3013.87	22.5	405.64	3161.01	21.90	398.92	3096.24	25.10	435.80
12/20/2017	416.80		3046.72	21.40	381.36	3010.17	22.5	406.47	3160.51	22.10	399.06	3099.02	23.80	435.07

Notes:

- (1) Elevations are in feet relative to NAVD88 datum.
- (2) Temperature values listed in red are adjusted for temperature reading errors.

**TABLE 2
SAN JOAQUIN DAM
VIBRATING WIRE PIEZOMETER MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017**

Vibrating Wire Piezo. ----->			VB-5			VB-6			VB-7			VB-8		
Top of AC Elevation ----->			402.0			408.0			422.0			452.5		
Piezo. Tip Elevation ----->			392.8			392.0			402.0			441.0		
Date	Reservoir Elevation (feet)	comments	read. (Hz)	temp. (°C)	elevation (ft)	read. (Hz)	temp. (°C)	elevation (ft)	read. (Hz)	temp. (°C)	elevation (ft)	read. (Hz)	temp. (°C)	elevation (ft)
1/3/2008	443.20		2894.90	21.40	438.34				3083.60	22.4	400.84	3061.00	23.30	440.94
1/29/2008	452.20		2854.10	20.90	447.17	3005.00	22.40	420.64	3083.40	22.4	400.88	3063.40	22.40	440.32
2/27/2008	460.80		2818.20	20.40	454.82	2976.70	22.40	427.06	3083.60	22.4	400.84	3060.50	21.50	440.96
3/26/2008	468.00		2784.90	20.20	461.83				3083.60	22.4	400.84	3043.50	20.80	444.94
4/29/2008	468.60		2780.60	20.00	462.73				3083.70	22.4	400.81	3026.80	20.50	448.86
5/29/2008	464.70		2795.90	19.50	459.50	2944.40	22.40	434.31	3083.90	22.4	400.76	3024.30	20.50	449.44
6/26/2008	455.70		2831.80	20.50	451.93	2960.10	22.40	430.80	3084.00	22.4	400.74	3031.20	20.80	447.84
7/29/2008	447.30		2866.80	21.30	444.44	2980.50	22.40	426.21	3084.10	22.4	400.72	3038.50	21.50	446.16
8/28/2008	438.80		2904.30	22.80	436.34	2999.10	22.40	421.99	3084.20	22.4	400.69	3042.10	22.70	445.38
9/26/2008	430.70		2935.00	23.10	429.58	3014.60	22.60	418.45	3084.20	22.4	400.69	3044.90	23.70	444.78
10/29/2008	412.50		3002.50	23.30	414.43	3044.50	22.40	411.56	3084.00	22.4	400.74	3048.20	24.40	444.04
11/25/2008	404.70		3035.00	22.90	406.98	3060.70	22.40	407.80	3083.90	21.30	400.75	3051.30	22.40	443.19
12/30/2008	440.90		2916.70	21.40	433.55	3047.30	22.40	410.91	3083.40	22.4	400.88	3056.10	23.70	442.13
1/28/2009	463.70		2807.60	20.90	457.09	2990.00	22.40	424.05	3083.20	22.4	400.93	3055.40	22.50	442.22
2/25/2009	470.10		2774.50	20.50	464.02	2946.10	22.40	433.93	3083.30	22.4	400.91	3035.40	21.80	446.91
3/26/2009	469.40		2776.20	19.50	463.63	2936.10	22.40	436.16	3083.50	22.4	400.86	3024.60	21.20	449.41
4/29/2009	466.90		2784.60	20.20	461.90	2936.30	22.40	436.12	3083.50	22.4	400.86	3020.60	20.80	450.33
5/18/2009	466.70		2786.00	20.40	461.61	2937.00	22.40	435.96	3082.00	22.4	401.22	3021.00	20.70	450.23
5/29/2009	465.00		2797.20	20.50	459.26	2941.10	22.40	435.05	3083.70	22.4	400.81	3022.20	20.80	449.95
6/30/2009	460.20		2814.40	20.70	455.64	2949.90	22.40	433.09	3083.90	20.70	400.74	3027.00	20.80	448.83
7/30/2009	451.10		2851.00	21.20	447.85	2966.50	22.40	429.36	3083.90	20.70	400.74	3034.20	20.90	447.14
8/25/2009	440.10		2895.60	22.00	438.21	2988.20	21.80	424.46	3084.00	21.60	400.73	3038.40	21.60	446.19
9/30/2009	432.20		2929.20	23.00	430.86	3008.60	22.70	419.82	3084.10	22.30	400.72	3042.30	22.40	445.32
10/29/2009	431.40		2935.00	23.00	429.57	3018.70	21.50	417.50	3083.90	21.40	400.75	3045.90	22.00	444.44
12/1/2009	427.40		2953.90	21.80	425.32	3029.40	21.70	415.04	3083.70	21.60	400.80	3050.20	23.90	443.54
12/29/2009	448.10		2873.30	21.50	443.04	3012.70	22.40	418.88	3083.40	21.60	400.87	3054.20	22.40	442.50
1/27/2010	465.60		2796.20	20.80	459.49	2966.40	22.40	429.39	3083.40	21.50	400.87	3050.60	21.80	443.32
2/25/2010	470.20		2772.60	20.40	464.41	2936.00	20.50	436.16	3083.30	20.70	400.89	3029.40	21.60	448.31
3/29/2010	465.70		2790.40	19.40	460.65	2938.20	20.00	435.67	3083.40	20.30	400.86	3023.50	20.50	449.63
4/4/2010	465.00		2792.60	19.30	460.18	2939.80	22.40	435.34	3083.40	21.00	400.87	3023.80	20.90	449.58
4/27/2010	468.40		2779.20	22.1	463.11	2936.10	20.00	436.13	3083.30	20.10	400.88	3021.30	20.20	450.13
5/27/2010	463.30		2800.00	20.10	458.66	2940.00	20.10	435.27	3083.00	20.20	400.95	3021.00	20.20	450.20
6/30/2010	454.70		2847.10	20.50	448.65	2963.10	20.30	430.10	3083.60	20.40	400.81	3031.70	20.50	447.71
7/28/2010	445.60		2873.20	21.00	443.04	2977.10	20.80	426.96	3083.60	20.80	400.82	3036.30	20.80	446.64
8/31/2010	437.10		2910.10	22.20	435.04	2998.30	21.80	422.16	3083.70	21.60	400.80	3040.50	21.60	445.70
9/29/2010	422.70		2967.70	23.10	422.28	3023.70	22.70	416.36	3083.90	22.40	400.76	3043.30	22.40	445.08
10/27/2010	426.40		2962.60	22.10	423.38	3035.00	21.80	413.75	3083.70	21.70	400.80	3045.80	21.80	444.46
11/29/2010	439.80		2908.50	21.80	435.37	3025.20	21.70	416.01	3083.10	21.60	400.95	3049.00	21.70	443.70
12/30/2010	456.60		2836.60	20.90	450.92	2991.90	21.00	423.61	3083.10	21.00	400.94	3050.30	21.20	443.36

Notes:

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**TABLE 2
SAN JOAQUIN DAM
VIBRATING WIRE PIEZOMETER MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017**

Vibrating Wire Piezo. ----->			VB-5			VB-6			VB-7			VB-8		
Top of AC Elevation ----->			402.0			408.0			422.0			452.5		
Piezo. Tip Elevation ----->			392.8			392.0			402.0			441.0		
Date	Reservoir Elevation (feet)	comments	read. (Hz)	temp. (°C)	elevation (ft)	read. (Hz)	temp. (°C)	elevation (ft)	read. (Hz)	temp. (°C)	elevation (ft)	read. (Hz)	temp. (°C)	elevation (ft)
2/1/2011	468.90		2782.00	20.30	462.45	2942.50	20.40	434.71	3083.00	20.50	400.96	3032.00	20.60	447.64
2/23/2011	469.00		2776.70	19.90	463.54	2936.80	20.00	435.98	3082.80	20.20	401.00	3023.60	20.30	449.60
3/29/2011	470.30		2770.70	19.80	464.79	2931.60	19.80	437.13	3082.90	19.80	400.97	3014.70	19.90	451.66
4/27/2011	464.80		2794.60	19.50	459.77	2938.10	19.50	435.68	3088.20	19.60	399.69	3014.30	19.70	451.74
5/26/2011	457.30		2824.80	20.00	453.40	2953.30	20.00	432.30	3083.10	19.90	400.92	3020.80	19.90	450.23
6/28/2011	443.50		2881.70	20.20	441.17	2977.90	20.00	426.77	3083.40	20.10	400.85	3027.90	20.10	448.58
7/29/2011	425.10		2941.90	21.40	427.98	3008.30	21.10	419.87	3083.70	20.90	400.79	3029.60	20.90	448.22
8/24/2011	418.00		3001.00	22.00	414.71	3037.90	21.60	413.08	3083.60	21.40	400.82	3029.10	21.40	448.37
9/27/2011	400.90		3048.20	23.70	403.97	3060.70	23.30	407.81	3083.40	22.90	400.89	3027.20	22.80	448.89
10/26/2011	402.20		3053.40	22.20	402.70	3069.60	22.00	405.72	3083.10	21.80	400.95	3028.20	22.00	448.61
11/30/2011	425.10		2982.10	21.60	418.98	3064.70	21.60	406.86	3082.70	21.50	401.04	3031.00	21.70	447.94
12/21/2011	435.70		2933.30	20.90	429.86	3056.20	21.00	408.83	3082.60	21.20	401.06	3033.70	21.20	447.28
1/24/2012	441.40		2900.60	20.80	437.07	3030.10	20.70	414.87	3083.20	20.80	400.91	3036.90	21.00	446.51
2/28/2012	448.40		2866.20	20.20	444.53	2999.00	20.10	421.98	3083.60	20.30	400.81	3038.60	20.40	446.08
3/26/2012	452.70		2849.60	20.00	448.10	2988.80	19.90	424.30	3083.70	20.90	400.79	3038.20	21.00	446.21
4/23/2012	463.40		2804.70	19.70	457.65	2959.30	19.60	430.95	3083.80	19.80	400.75	3030.70	19.90	447.91
5/30/2012	457.30		2825.80	20.20	453.20	2955.20	20.10	431.87	3083.90	20.10	400.73	3020.20	20.20	450.39
6/13/2012	452.90		2845.10	20.30	449.08	2963.40	20.10	430.03	3084.10	20.10	400.69	3021.50	20.30	450.09
6/26/2012	450.20		2856.30	20.40	446.67	2969.40	20.20	428.68	3084.20	20.10	400.66	3022.40	20.20	449.87
7/24/2012	439.80		2898.30	21.00	437.58	2988.60	21.10	424.36	3084.10	21.50	400.70	3024.10	21.80	449.57
8/8/2012	437.60		2909.30	21.70	435.19	2996.40	21.30	422.59	3084.20	20.40	400.67	3025.00	21.40	449.33
8/22/2012	433.40		2925.70	22.40	431.61	3004.60	22.10	420.73	3084.30	22.00	400.66	3025.40	22.00	449.27
8/29/2012	431.30		2934.70	22.90	429.64	3009.00	22.10	419.72	3084.40	21.90	400.64	3025.50	22.00	449.25
9/25/2012	420.80		2982.10	21.60	418.98	3021.40	21.60	416.88	3084.00	21.50	400.73	3027.00	22.4	448.92
10/31/2012	412.30		3008.40	23.20	413.08	3046.60	22.50	411.08	3084.10	22.30	400.72	3028.30	22.40	448.61
11/27/2012	420.80		2991.70	21.90	416.82	3051.30	23.40	410.00	3083.60	23.80	400.86	3031.10	24.50	448.08
12/18/2012	448.00		2883.10	21.40	440.91	3030.40	21.40	414.81	3083.40	21.40	400.87	3033.90	21.50	447.25
1/29/2013	468.60		2781.70	20.80	462.53	2949.20	20.90	433.22	3083.00	20.90	400.96	3018.10	21.00	450.93
2/28/2013	469.20		2777.10	20.10	463.46	2933.30	20.30	436.76	3093.10	20.40	398.52	3004.30	20.50	454.12
3/27/2013	468.30		2780.30	19.30	462.76	2931.00	19.30	437.26	3083.40	19.40	400.85	2998.80	19.50	455.34
4/25/2013	462.70		2798.30	19.40	458.99	2938.70	19.60	435.55	3083.60	19.80	400.80	2699.30	19.90	521.34
5/21/2013	454.20		2836.60	20.30	450.90	2954.90	20.50	431.94	3083.60	20.50	400.81	3007.80	20.40	453.30
6/25/2013	439.30		2894.60	20.00	438.35	2986.00	20.00	424.93	3084.10	20.10	400.69	3015.90	20.30	451.40
7/23/2013	431.50		2926.20	21.70	431.47	3004.70	21.40	420.70	3084.10	21.20	400.70	3019.20	21.30	450.69
8/21/2013	418.00		2978.40	22.60	419.85	3029.70	22.30	414.98	3084.10	20.60	400.69	3021.60	21.70	450.15
9/24/2013	404.00		3033.80	23.10	407.26	3055.10	22.70	409.11	3084.00	21.40	400.73	3023.50	22.20	449.73
10/29/2013	400.60		3047.90	23.70	404.04	3066.20	23.30	406.53	3083.80	22.90	400.80	3026.40	23.00	449.09
11/26/2013	407.90		3036.10	22.40	406.70	3071.80	22.20	405.21	3083.30	22.10	400.90	3029.70	22.20	448.27
12/19/2013	425.80		2973.50	22.40	420.95	3063.50	22.60	407.15	3083.30	23.10	400.92	3032.80	23.50	447.62

Notes:

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**TABLE 2
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VIBRATING WIRE PIEZOMETER MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017**

Vibrating Wire Piezo. ----->			VB-5			VB-6			VB-7			VB-8		
Top of AC Elevation ----->			402.0			408.0			422.0			452.5		
Piezo. Tip Elevation ----->			392.8			392.0			402.0			441.0		
Date	Reservoir Elevation (feet)	comments	read. (Hz)	temp. (°C)	elevation (ft)	read. (Hz)	temp. (°C)	elevation (ft)	read. (Hz)	temp. (°C)	elevation (ft)	read. (Hz)	temp. (°C)	elevation (ft)
1/28/2014	439.70		2904.80	21.10	436.16	3039.50	21.10	412.70	3083.10	21.10	400.94	3036.90	21.20	446.52
2/25/2014	449.70		2860.40	20.70	445.80	3009.40	20.70	419.62	3083.10	20.80	400.94	3038.00	20.90	446.25
3/26/2014	465.10		2793.50	20.50	460.04	2960.10	20.40	430.78	3082.90	20.50	400.98	3027.30	20.60	448.75
3/28/2014	465.70		2789.00	20.50	460.99	2956.20	20.50	431.65	3083.00	20.50	400.96	3024.90	20.60	449.31
4/29/2014	465.30		2788.40	20.30	461.10	2939.20	20.30	435.45	3083.20	20.40	400.91	3010.20	20.50	452.74
5/28/2014	450.60		2850.30	20.50	447.97	2962.10	20.50	430.33	3083.20	20.50	400.91	3016.20	20.60	451.35
6/25/2014	440.10		2893.50	20.80	438.62	2983.70	20.80	425.46	3083.40	20.80	400.86	3019.70	20.80	450.54
7/29/2014	431.20		2929.30	21.80	430.79	3003.60	21.70	420.95	3083.40	21.60	400.87	3022.20	21.70	450.01
8/26/2014	419.50		2974.50	24.60	420.81	3024.40	23.40	416.21	3083.40	22.70	400.89	3023.40	22.70	449.78
9/23/2014	405.30		3028.00	27.70	408.78	3048.00	21.40	410.74	3083.40	21.10	400.87	3024.50	25.00	449.65
10/29/2014	400.90		3049.10	23.70	403.76	3060.90	23.40	407.76	3083.10	23.10	400.97	3026.50	23.20	449.08
11/25/2014	410.90		3027.90	22.70	408.60	3065.70	22.60	406.64	3082.70	22.50	401.05	3029.40	22.70	448.37
12/30/2014	430.60		2960.20	23.20	423.97	3055.70	23.50	408.98	3082.70	24.10	401.08	3032.20	25.10	447.85
1/27/2015	466.70		2789.20	21.70	460.99	2971.80	21.70	428.16	3082.20	21.80	401.17	3025.20	22.00	449.32
2/25/2015	468.90		2775.60	21.40	463.83	2937.10	21.40	435.93	3082.40	21.50	401.11	3008.20	21.70	453.28
3/26/2015	465.90		2787.40	21.20	461.35	2932.70	21.20	436.90	3082.50	21.20	401.09	3001.40	21.30	454.84
4/28/2015	465.70		2788.70	20.40	461.05	2932.70	21.30	436.90	3082.70	21.50	401.04	2999.60	21.60	455.28
5/28/2015	466.40		2786.70	21.50	461.51	2929.00	21.70	437.73	3082.70	21.80	401.05	2996.90	21.90	455.92
6/30/2015	454.50		2836.10	22.00	451.07	2947.30	21.10	433.65	3082.70	21.50	401.04	3005.20	22.00	453.99
7/28/2015	445.60		2873.70	21.70	442.97	2969.60	21.70	428.66	3082.00	21.70	401.21	3012.30	21.70	452.32
8/28/2015	437.60		2905.10	22.10	436.13	2987.30	22.10	424.66	3082.70	22.00	401.05	3015.80	22.10	451.53
9/24/2015	426.90		2950.00	22.90	426.23	3009.00	22.20	419.72	3082.00	22.70	401.23	3018.00	24.70	451.16
10/27/2015	415.40		2995.10	26.30	416.23	3030.80	24.80	414.75	3082.70	23.90	401.07	3021.20	23.90	450.36
11/19/2015	412.90		3012.80	22.90	412.06	3043.80	22.80	411.73	3082.70	22.70	401.06	3023.70	22.80	449.72
12/22/2015	425.50		2973.77	21.80	420.86	3043.85	22.20	411.71	3082.21	22.20	401.17	3029.19	24.60	448.53
1/27/2016	463.60		2810.16	20.80	456.54	2992.70	21.90	423.44	3081.63	22.20	401.31	3030.50	23.20	448.14
2/25/2016	468.90		2778.86	20.30	463.10	2941.28	21.60	435.00	3081.70	22.00	401.29	3012.31	22.40	452.36
3/30/2016	468.00		2778.46	20.10	463.18	2925.94	21.60	438.41	3081.96	21.70	401.22	2999.64	21.80	455.28
4/28/2016	461.30		2809.03	20.10	456.75	2934.25	21.00	436.56	3082.13	21.50	401.18	3001.02	21.50	454.94
5/25/2016	451.30		2850.06	20.30	448.01	2954.44	20.90	432.05	3082.16	21.40	401.17	3009.90	21.50	452.87
6/28/2016	414.10		2884.16	20.70	440.65	2973.70	20.90	427.72	3081.49	21.30	401.33	3016.37	21.90	451.38
7/27/2016	434.20	10 day hold from 7/11/16 to 7/21/16 @ 438'	2922.10	21.30	432.36	2992.17	21.00	423.55	3082.40	21.30	401.11	3018.40	23.00	450.97
8/23/2016	418.60	5 day hold from 8/23/16 to 8/28/16	2980.42	22.10	419.38	3018.64	21.20	417.51	3082.90	21.30	400.99	3019.75	24.10	450.72
9/27/2016	406.40	10 day hold from 9/30/2016 to 10/10/2016	3033.58	22.70	407.30	3044.78	21.60	411.49	3082.08	21.60	401.19	3022.43	25.00	450.14
10/26/2016	404.00		3048.70	22.70	403.81	3055.10	21.90	409.10	3081.90	21.90	401.24	3025.10	25.20	449.52
11/22/2016	413.60		3023.53	22.50	409.59	3058.41	26.20	408.38	3081.70	22.10	401.29	3028.17	25.10	448.80
12/20/2016	441.10		2918.66	22.00	433.15	3040.23	22.30	412.55	3081.55	22.30	401.33	3031.56	24.50	447.97

Notes:

(1) Elevations are in feet relative to NAVD88 datum.

(2) Temperature values listed in red are adjusted for temperature reading errors.

**TABLE 2
SAN JOAQUIN DAM
VIBRATING WIRE PIEZOMETER MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017**

Vibrating Wire Piezo. ----->			VB-5			VB-6			VB-7			VB-8		
Top of AC Elevation ----->			402.0			408.0			422.0			452.5		
Piezo. Tip Elevation ----->			392.8			392.0			402.0			441.0		
Date	Reservoir Elevation (feet)	comments	read. (Hz)	temp. (°C)	elevation (ft)	read. (Hz)	temp. (°C)	elevation (ft)	read. (Hz)	temp. (°C)	elevation (ft)	read. (Hz)	temp. (°C)	elevation (ft)
1/26/2017	471.60		2771.84	21.10	464.60	2953.45	22.00	432.29	3081.10	22.30	401.44	3014.56	23.20	451.88
2/24/2017	472.05		2767.24	20.50	465.54	2925.06	21.70	438.60	3081.04	22.10	401.45	2999.46	22.40	455.35
2/25/2017	472.00		2767.01	20.50	465.58	2924.57	21.80	438.71	3081.08	22.10	401.44	2998.95	22.40	455.47
2/26/2017	472.00		2767.46	20.40	465.49	2924.16	21.70	438.80	3081.09	22.10	401.44	2992.11	22.30	457.05
2/27/2017	472.00		2767.31	20.40	465.52	2924.02	21.80	438.83	3081.09	22.10	401.44	2992.67	22.30	456.92
2/28/2017	471.90		2768.30	20.40	465.31	2923.73	21.70	438.90	3081.21	22.10	401.41	2998.07	22.30	455.67
3/1/2017	471.90		2767.52	20.40	465.47	2924.67	21.80	438.69	3081.14	22.10	401.42	2996.94	22.40	455.94
3/2/2017	471.90		2767.23	20.40	465.53	2922.65	21.70	439.14	3080.93	22.10	401.47	2997.18	22.20	455.87
3/29/2017	467.90		2784.31	19.90	461.95	2924.16	21.40	438.80	3080.93	21.80	401.47	2995.28	21.60	456.28
4/27/2017	457.60		2826.30	19.80	453.07	2941.70	21.10	434.90	3081.00	21.60	401.45	3003.50	21.20	454.35
5/23/2017	453.50		2846.14	20.10	448.84	2954.91	20.90	431.95	3081.02	21.40	401.44	3010.76	21.20	452.65
6/21/2017	447.40		2872.23	20.50	443.23	2966.15	20.80	429.42	3081.04	21.30	401.44	3015.40	21.50	451.59
7/26/2017	435.10		2922.05	21.20	432.37	2990.05	20.90	424.03	3080.91	21.20	401.47	3018.38	22.70	450.96
8/25/2017	420.10		2981.67	22.10	419.09	3012.74	21.20	418.86	3080.63	21.30	401.54	3019.85	23.80	450.68
9/27/2017	407.10		3027.11	22.70	408.78	3040.78	21.50	412.41	3081.57	21.50	401.31	3019.85	24.70	450.73
10/26/2017	395.00		3063.05	22.80	400.49	3054.84	21.90	409.16	3080.57	21.80	401.56	3025.12	25.00	449.51
11/28/2017	409.00		2828.52	22.80	452.72	3060.62	22.20	407.81	3080.87	22.20	401.49	3028.84	24.90	448.63
12/20/2017	416.80		2998.56	22.10	415.27	3055.46	22.40	409.02	3079.92	22.30	401.72	3031.95	24.40	447.87

Notes:

- (1) Elevations are in feet relative to NAVD88 datum.
- (2) Temperature values listed in red are adjusted for temperature reading errors.

TABLE 3
SAN JOAQUIN DAM
PNEUMATIC PIEZOMETER MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017

Pneumatic Piezo. No. ----->		C-1				C-2			C-3			C-4			C-5		
Piezo. Tip Elevation ----->		357.1				339.8			363.3			392.8			379.4		
Zero Gage Reading ----->		52.0				35.3			58.8			27.7			14.9		
Date	Reservoir Elevation (feet)	comments	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment
1/3/2008	443.20		50.00	355.1		37.00	341.5		57.00	361.5		73.00	438.1		12.00	376.5	
1/29/2008	452.20		51.00	356.1		36.00	340.5		58.00	362.5		82.00	447.1		12.00	376.5	
2/27/2008	460.80		52.00	357.1		38.00	342.5		59.00	363.5		91.00	456.1		12.00	376.5	
3/26/2008	468.00		52.00	357.1		38.00	342.5		59.00	363.5		98.00	463.1		12.00	376.5	
4/29/2008	468.60		52.00	357.1		38.00	342.5		58.20	362.7		99.90	465.0		12.50	377.0	
5/29/2008	464.70		52.00	357.1		36.00	340.5		58.00	362.5		95.00	460.1		12.00	376.5	
6/26/2008	455.70		52.00	357.1		37.00	341.5		59.00	363.5		87.00	452.1		12.00	376.5	
7/29/2008	447.30		53.00	358.1		38.00	342.5		59.50	364.0		79.00	444.1		16.00	380.5	
8/28/2008	438.80		54.00	359.1		38.00	342.5		60.00	364.5		72.00	437.1		12.00	376.5	
9/26/2008	430.70		53.00	358.1		36.00	340.5		59.00	363.5		64.00	429.1		12.00	376.5	
10/29/2008	412.50		52.00	357.1		38.00	342.5		58.00	362.5		44.00	409.1		14.00	378.5	
11/25/2008	404.70		50.50	355.6		36.00	340.5		58.00	362.5		37.00	402.1		12.00	376.5	
12/30/2008	440.90		51.00	356.1		38.00	342.5		58.00	362.5		70.00	435.1		12.00	376.5	
1/28/2009	463.70		52.00	357.1		38.00	342.5		58.00	362.5		93.00	458.1		12.00	376.5	
2/25/2009	470.10		52.00	357.1		37.00	341.5		58.00	362.5		100.00	465.1		12.00	376.5	
3/26/2009	469.40		54.00	359.1		40.00	344.5		60.00	364.5		100.00	465.1		12.50	377.0	
4/29/2009	466.90		54.00	359.1		40.00	344.5		60.00	364.5		98.00	463.1		12.00	376.5	
5/18/2009	466.70		54.00	359.1		40.00	344.5		59.00	363.5		97.00	462.1		13.00	377.5	
5/29/2009	465.00		52.00	357.1		36.00	340.5		59.00	363.5		95.00	460.1		12.00	376.5	
6/30/2009	460.20		54.00	359.1		40.00	344.5		59.00	363.5		90.00	455.1		13.00	377.5	
7/30/2009	451.10		55.00	360.1		40.00	344.5		60.00	364.5		82.00	447.1		14.00	378.5	
8/25/2009	440.10		54.00	359.1		40.00	344.5		59.00	363.5		71.00	436.1		12.00	376.5	
9/30/2009	432.20		54.00	359.1		38.00	342.5		58.00	362.5		63.00	428.1		12.00	376.5	
10/29/2009	431.40		52.00	357.1		40.00	344.5		59.00	363.5		63.00	428.1		13.00	377.5	
12/1/2009	427.40		53.00	358.1		39.00	343.5		58.00	362.5		59.00	424.1		13.00	377.5	
12/29/2009	448.10		54.00	359.1		39.00	343.5		58.00	362.5		78.00	443.1		13.00	377.5	
1/27/2010	465.60		52.00	357.1		39.00	343.5		58.00	362.5		95.00	460.1		14.00	378.5	
2/25/2010	470.20		56.00	361.1		40.00	344.5		59.00	363.5		100.00	465.1		14.00	378.5	
3/29/2010	465.70		54.00	359.1		40.00	344.5		58.00	362.5		96.00	461.1		13.00	377.5	
4/4/2010	465.00		55.00	360.1		40.00	344.5		60.00	364.5		96.00	461.1		14.00	378.5	
4/27/2010	468.40		55.00	360.1		40.00	344.5		59.00	363.5		99.00	464.1		14.00	378.5	
5/27/2010	463.30		56.00	361.1		40.00	344.5		60.00	364.5		94.00	459.1		15.00	379.5	
6/30/2010	454.70		56.00	361.1		40.00	344.5		59.00	363.5		86.00	451.1		14.00	378.5	
7/28/2010	445.60		56.00	361.1		40.00	344.5		60.00	364.5		78.00	443.1		14.00	378.5	
8/31/2010	437.10		56.00	361.1		41.00	345.5		59.00	363.5		68.00	433.1		14.00	378.5	
9/29/2010	422.70		55.00	360.1		40.00	344.5		58.00	362.5		56.00	421.1		14.00	378.5	
10/27/2010	426.40		56.00	361.1		40.00	344.5		60.00	364.5		56.00	421.1		14.00	378.5	
11/29/2010	439.80		55.00	360.1		41.00	345.5		59.00	363.5		70.00	435.1		14.00	378.5	
12/30/2010	456.60		56.00	361.1		40.00	344.5		59.00	363.5		85.00	450.1		16.00	380.5	

Notes:

Elevations are in feet relative to NAVD88 datum.

TABLE 3
SAN JOAQUIN DAM
PNEUMATIC PIEZOMETER MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017

Pneumatic Piezo. No. ----->			C-1			C-2			C-3			C-4			C-5		
Piezo. Tip Elevation ----->			357.1			339.8			363.3			392.8			379.4		
Zero Gage Reading ----->			52.0			35.3			58.8			27.7			14.9		
Date	Reservoir Elevation (feet)	comments	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment
2/1/2011	468.90		56.00	361.1		41.00	345.5		60.00	364.5		99.00	464.1		15.00	379.5	
2/23/2011	469.00		56.00	361.1		41.00	345.5		60.00	364.5		100.00	465.1		17.00	381.5	
3/29/2011	470.30		55.00	360.1		40.00	344.5		60.00	364.5		100.00	465.1		16.00	380.5	
4/27/2011	464.80		56.00	361.1		41.00	345.5		60.00	364.5		96.00	461.1		17.00	381.5	
5/26/2011	457.30		54.00	359.1		42.00	346.5		60.00	364.5		89.00	454.1		17.00	381.5	
6/28/2011	443.50		54.00	359.1		41.00	345.5		60.00	364.5		75.00	440.1		17.00	381.5	
7/29/2011	425.10		54.00	359.1		40.00	344.5		60.00	364.5		60.00	425.1		16.00	380.5	
8/24/2011	418.00		52.00	357.1		41.00	345.5		59.00	363.5		46.00	411.1		16.00	380.5	
9/27/2011	400.90		51.00	356.1		40.00	344.5		58.00	362.5		34.00	399.1		16.00	380.5	
10/26/2011	402.20		50.00	355.1		38.00	342.5		59.00	363.5		32.00	397.1		14.00	378.5	
11/30/2011	425.10		51.00	356.1		40.00	344.5		58.00	362.5		55.00	420.1		16.00	380.5	
12/21/2011	435.70		51.00	356.1		40.00	344.5		58.00	362.5		66.00	431.1		18.00	382.5	
1/24/2012	441.40		50.00	355.1		39.00	343.5		58.00	362.5		51.00	416.1		17.00	381.5	
2/28/2012	448.40		44.00	349.1		39.00	343.5		59.00	363.5		80.00	445.1		14.00	378.5	
3/26/2012	452.70		49.00	354.1		40.00	344.5		58.00	362.5		82.00	447.1		17.00	381.5	
4/23/2012	463.40		48.00	353.1		40.00	344.5		58.00	362.5		92.00	457.1		18.00	382.5	
5/30/2012	457.30		49.00	354.1		40.00	344.5		59.00	363.5		88.00	453.1		18.00	382.5	
6/13/2012	452.90		48.00	353.1		40.00	344.5		58.00	362.5		84.00	449.1		17.00	381.5	
6/26/2012	450.20		50.00	355.1		40.00	344.5		60.00	364.5		80.00	445.1		18.00	382.5	
7/24/2012	439.80		48.00	353.1		40.00	344.5		59.00	363.5		70.00	435.1		18.00	382.5	
8/8/2012	437.60		48.00	353.1		40.00	344.5		58.00	362.5		70.00	435.1		18.00	382.5	
8/22/2012	433.40		48.00	353.1		40.00	344.5		59.00	363.5		66.00	431.1		18.00	382.5	
8/29/2012	431.30		49.00	354.1		40.00	344.5		60.00	364.5		63.00	428.1		18.00	382.5	
9/25/2012	420.80		49.00	354.1		40.00	344.5		58.00	362.5		55.00	420.1		17.00	381.5	
10/31/2012	412.30		47.00	352.1		40.00	344.5		58.00	362.5		44.00	409.1		17.00	381.5	
11/27/2012	420.80		48.00	353.1		40.00	344.5		59.00	363.5		50.00	415.1		17.00	381.5	
12/18/2012	448.00		48.00	353.1		40.00	344.5		60.00	364.5		76.00	441.1		17.00	381.5	
1/29/2013	468.60		49.00	354.1		40.00	344.5		59.00	363.5		98.00	463.1		18.00	382.5	
2/28/2013	469.20		50.00	355.1		40.00	344.5		60.00	364.5		100.00	465.1		19.00	383.5	
3/27/2013	468.30		50.00	355.1		41.00	345.5		60.00	364.5		99.00	464.1		18.00	382.5	
4/25/2013	462.70		49.00	354.1		38.00	342.5		58.00	362.5		94.00	459.1		18.00	382.5	
5/21/2013	454.20		49.00	354.1		40.00	344.5		59.00	363.5		86.00	451.1		18.00	382.5	
6/25/2013	439.30		49.00	354.1		40.00	344.5		59.00	363.5		70.00	435.1		18.00	382.5	
7/23/2013	431.50		49.00	354.1		40.00	344.5		60.00	364.5		62.00	427.1		18.00	382.5	
8/21/2013	418.00		49.00	354.1		40.00	344.5		59.00	363.5		50.00	415.1		18.00	382.5	
9/24/2013	404.00		48.00	353.1		41.00	345.5		59.00	363.5		37.00	402.1		18.00	382.5	
10/29/2013	400.60		45.00	350.1		40.00	344.5		57.00	361.5		33.00	398.1		18.00	382.5	
11/26/2013	407.90		44.00	349.1		39.00	343.5		56.00	360.5		36.00	401.1		18.00	382.5	
12/19/2013	425.80		45.00	350.1		40.00	344.5		56.00	360.5		55.00	420.1		18.00	382.5	

Notes:

Elevations are in feet relative to NAVD88 datum.

**TABLE 3
SAN JOAQUIN DAM
PNEUMATIC PIEZOMETER MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017**

Pneumatic Piezo. No. ----->			C-1			C-2			C-3			C-4			C-5		
Piezo. Tip Elevation ----->			357.1			339.8			363.3			392.8			379.4		
Zero Gage Reading ----->			52.0			35.3			58.8			27.7			14.9		
Date	Reservoir Elevation (feet)	comments	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment
1/28/2014	439.70		45.00	350.1		39.00	343.5		57.00	361.5		70.00	435.1		18.00	382.5	
2/25/2014	449.70		45.00	350.1		40.00	344.5		57.00	361.5		80.00	445.1		18.00	382.5	
3/26/2014	465.10		46.00	351.1		40.00	344.5		58.00	362.5		95.00	460.1		19.00	383.5	
3/28/2014	465.70		45.00	350.1		40.00	344.5		58.00	362.5		96.00	461.1		19.00	383.5	
4/29/2014	465.30		46.00	351.1		40.00	344.5		58.00	362.5		96.00	461.1		20.00	384.5	
5/28/2014	450.60		44.00	349.1		40.00	344.5		57.00	361.5		82.00	447.1		19.00	383.5	
6/25/2014	440.10		45.00	350.1		41.00	345.5		58.00	362.5		72.00	437.1		19.00	383.5	
7/29/2014	431.20		44.00	349.1		40.00	344.5		57.00	361.5		63.00	428.1		19.00	383.5	
8/26/2014	419.50		44.00	349.1		40.00	344.5		58.00	362.5		52.00	417.1		18.00	382.5	
9/23/2014	405.30		42.00	347.1		37.00	341.5		56.00	360.5		38.00	403.1		18.00	382.5	
10/29/2014	400.90		42.00	347.1		40.00	344.5		56.00	360.5		33.00	398.1		18.00	382.5	
11/25/2014	410.90		41.00	346.1		39.00	343.5		56.00	360.5		40.00	405.1		18.00	382.5	
12/30/2014	430.60		41.00	346.1		38.00	342.5		57.00	361.5		59.00	424.1		18.00	382.5	
1/27/2015	466.70		43.00	348.1		40.00	344.5		57.00	361.5		96.00	461.1		20.00	384.5	
2/25/2015	468.90		43.00	348.1		40.00	344.5		57.00	361.5		99.00	464.1		19.00	383.5	
3/26/2015	465.90		44.00	349.1		42.00	346.5		58.00	362.5		97.00	462.1		20.00	384.5	
4/28/2015	465.70		43.00	348.1		41.00	345.5		57.00	361.5		97.00	462.1		20.00	384.5	
5/28/2015	466.40		42.00	347.1		41.00	345.5		57.00	361.5		97.00	462.1		19.00	383.5	
6/30/2015	454.50		43.00	348.1		42.00	346.5		58.00	362.5		86.00	451.1		19.00	383.5	
7/28/2015	445.60		42.00	347.1		41.00	345.5		57.00	361.5		78.00	443.1		19.00	383.5	
8/28/2015	437.60		43.00	348.1		42.00	346.5		57.00	361.5		70.00	435.1		18.00	382.5	
9/24/2015	426.90		42.00	347.1		41.00	345.5		57.00	361.5		59.00	424.1		19.00	383.5	
10/27/2015	415.40		42.00	347.1		41.00	345.5		57.00	361.5		48.00	413.1		19.00	383.5	
11/19/2015	412.90		39.00	344.1		40.00	344.5		56.00	360.5		43.00	408.1		18.00	382.5	
12/22/2015	425.50		37.00	342.1		41.00	345.5		57.00	361.5		55.00	420.1		18.00	382.5	
1/27/2016	463.60		39.00	344.1		41.00	345.5		57.00	361.5		93.00	458.1		19.00	383.5	
2/25/2016	468.90		39.00	344.1		42.00	346.5		57.00	361.5		100.00	465.1		20.00	384.5	
3/30/2016	468.00		38.00	343.1		43.00	347.5		58.00	362.5		100.00	465.1		20.00	384.5	
4/28/2016	461.30		39.00	344.1		42.00	346.5		58.00	362.5		92.00	457.1		20.00	384.5	
5/25/2016	451.30		38.00	343.1		42.00	346.5		58.00	362.5		84.00	449.1		20.00	384.5	
6/28/2016	414.10		38.00	343.1		42.00	346.5		57.00	361.5		76.00	441.1		18.00	382.5	
7/27/2016	434.20		38.00	343.1		42.00	346.5		57.00	361.5		66.00	431.1		20.00	384.5	
8/23/2016	418.60		36.00	341.1		42.00	346.5		57.00	361.5		51.00	416.1		20.00	384.5	
9/27/2016	406.40		36.00	341.1		42.00	346.5		57.00	361.5		40.00	405.1		20.00	384.5	
10/26/2016	404.00		34.00	339.1		41.00	345.5		57.00	361.5		36.00	401.1		19.00	383.5	
11/22/2016	413.60		32.00	337.1		41.00	345.5		56.00	360.5		42.00	407.1		19.00	383.5	
12/20/2016	441.10		35.00	340.1		40.00	344.5		56.00	360.5		70.00	435.1		19.00	383.5	

Notes:
Elevations are in feet relative to NAVD88 datum.

**TABLE 3
SAN JOAQUIN DAM
PNEUMATIC PIEZOMETER MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017**

Pneumatic Piezo. No. ----->			C-1			C-2			C-3			C-4			C-5		
Piezo. Tip Elevation ----->			357.1			339.8			363.3			392.8			379.4		
Zero Gage Reading ----->			52.0			35.3			58.8			27.7			14.9		
Date	Reservoir Elevation (feet)	comments	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment
1/26/2017	471.60		38.00	343.1		41.00	345.5		57.00	361.5		101.00	466.1		20.00	384.5	
2/24/2017	472.05		37.00	342.1		42.00	346.5		58.00	362.5		103.00	468.1		20.00	384.5	
2/25/2017	472.00																
2/26/2017	472.00																
2/27/2017	472.00		37.00	342.1		42.00	346.5		58.00	362.5		102.00	467.1		20.00	384.5	
2/28/2017	471.90		39.00	344.1		43.00	347.5		58.00	362.5		103.00	468.1		20.00	384.5	
3/1/2017	471.90		37.00	342.1		42.00	346.5		58.00	362.5		103.00	468.1		20.00	384.5	
3/2/2017	471.90		37.00	342.1		43.00	347.5		58.00	362.5		102.00	467.1		20.00	384.5	
3/29/2017	467.90		38.00	343.1		44.00	348.5		58.00	362.5		100.00	465.1		20.00	384.5	
4/27/2017	457.60		37.00	342.1		43.00	347.5		58.00	362.5		89.00	454.1		20.00	384.5	
5/23/2017	453.50		36.00	341.1		42.00	346.5		58.00	362.5		85.00	450.1		20.00	384.5	
6/21/2017	447.40		38.00	343.1		44.00	348.5		58.00	362.5		80.00	445.1		20.00	384.5	
7/26/2017	435.10		36.00	341.1		43.00	347.5		58.00	362.5		67.00	432.1		20.00	384.5	
8/25/2017	420.10		35.00	340.1		42.00	346.5		57.00	361.5		51.00	416.1		19.00	383.5	
9/27/2017	407.10		34.00	339.1		42.00	346.5		57.00	361.5		40.00	405.1		20.00	384.5	
10/26/2017	395.00		33.00	338.1		41.00	345.5		56.00	360.5		29.00	394.1		19.00	383.5	
11/28/2017	409.00		32.00	337.1		41.00	345.5		57.00	361.5		39.00	404.1		19.00	383.5	
12/20/2017	416.80		32.00	337.1		40.00	344.5		55.00	359.5		46.00	411.1		18.00	382.5	

Notes:
Elevations are in feet relative to NAVD88 datum.

TABLE 3
SAN JOAQUIN DAM
PNEUMATIC PIEZOMETER MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017

Pneumatic Piezo. No. ----->			C-6			C-7			C-8			C-9			RR-2		
Piezo. Tip Elevation ----->			392.0			324.9			440.6			357.0			393.2		
Zero Gage Reading ----->			27.5			21.0			17.5			53.1			29.9		
Date	Reservoir Elevation (feet)	comments	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment
1/3/2008	443.20		39.00	403.5		18.00	321.9		16.00	439.1		60.00	363.9		67.00	430.3	
1/29/2008	452.20		42.00	406.5		18.00	321.9		17.00	440.1		60.00	363.9		76.00	439.3	
2/27/2008	460.80		46.00	410.5		19.00	322.9		19.00	442.1		60.00	363.9		84.00	447.3	
3/26/2008	468.00		51.00	415.5		19.00	322.9		26.00	449.1		60.00	363.9		91.00	454.3	
4/29/2008	468.60		55.00	419.5		18.00	321.9		31.00	454.1		60.00	363.9		92.00	455.3	
5/29/2008	464.70		55.00	419.5		18.00	321.9		32.00	455.1		60.00	363.9		90.00	453.3	
6/26/2008	455.70		54.00	418.5		18.00	321.9		28.00	451.1		60.00	363.9		82.00	445.3	
7/29/2008	447.30		50.00	414.5		18.50	322.4		26.00	449.1		61.00	364.9		75.00	438.3	
8/28/2008	438.80		48.00	412.5		18.00	321.9		25.00	448.1		60.00	363.9		68.00	431.3	
9/26/2008	430.70		46.00	410.5		19.00	322.9		23.00	446.1		61.00	364.9		60.00	423.3	
10/29/2008	412.50		40.00	404.5		18.00	321.9		22.00	445.1		60.00	363.9		44.00	407.3	
11/25/2008	404.70		38.00	402.5		18.00	321.9		20.00	443.1		60.00	363.9		36.00	399.3	
12/30/2008	440.90		40.00	404.5		19.00	322.9		20.00	443.1		60.00	363.9		65.00	428.3	
1/28/2009	463.70		43.00	407.5		18.00	321.9		20.00	443.1		58.00	361.9		86.00	449.3	
2/25/2009	470.10		50.00	414.5		18.00	321.9		27.00	450.1		58.00	361.9		90.00	453.3	
3/26/2009	469.40		55.00	419.5		19.00	322.9		31.00	454.1		60.00	363.9		92.00	455.3	
4/29/2009	466.90		56.00	420.5		19.00	322.9		32.00	455.1		59.00	362.9		91.00	454.3	
5/18/2009	466.70		56.00	420.5		19.00	322.9		32.00	455.1		59.00	362.9		92.00	455.3	
5/29/2009	465.00		55.00	419.5		20.00	323.9		30.00	453.1		59.00	362.9		90.00	453.3	
6/30/2009	460.20		55.00	419.5		19.00	322.9		30.00	453.1		60.00	363.9		85.00	448.3	
7/30/2009	451.10		53.00	417.5		19.00	322.9		28.00	451.1		60.00	363.9		79.00	442.3	
8/25/2009	440.10		48.00	412.5		18.00	321.9		25.00	448.1		59.00	362.9		69.00	432.3	
9/30/2009	432.20		45.00	409.5		18.00	321.9		22.00	445.1		58.00	361.9		61.00	424.3	
10/29/2009	431.40		44.00	408.5		19.00	322.9		22.00	445.1		59.00	362.9		60.00	423.3	
12/1/2009	427.40		41.00	405.5		19.00	322.9		20.00	443.1		58.00	361.9		56.00	419.3	
12/29/2009	448.10		43.00	407.5		19.00	322.9		20.00	443.1		58.00	361.9		74.00	437.3	
1/27/2010	465.60		47.00	411.5		18.00	321.9		22.00	445.1		58.00	361.9		90.00	453.3	
2/25/2010	470.20		54.00	418.5		19.00	322.9		30.00	453.1		58.00	361.9		94.00	457.3	
3/29/2010	465.70		55.00	419.5		18.00	321.9		31.00	454.1		58.00	361.9		91.00	454.3	
4/4/2010	465.00		56.00	420.5		18.00	321.9		32.00	455.1		58.00	361.9		90.00	453.3	
4/27/2010	468.40		55.00	419.5		19.00	322.9		31.00	454.1		59.00	362.9		93.00	456.3	
5/27/2010	463.30		56.00	420.5		18.00	321.9		32.00	455.1		58.00	361.9		90.00	453.3	
6/30/2010	454.70		53.00	417.5		18.00	321.9		28.00	451.1		58.00	361.9		82.00	445.3	
7/28/2010	445.60		51.00	415.5		18.00	321.9		26.00	449.1		58.00	361.9		74.00	437.3	
8/31/2010	437.10		47.00	411.5		19.00	322.9		24.00	447.1		59.00	362.9		67.00	430.3	
9/29/2010	422.70		42.00	406.5		19.00	322.9		22.00	445.1		53.00	356.9		52.00	415.3	
10/27/2010	426.40		42.00	406.5		19.00	322.9		21.00	444.1		58.00	361.9		56.00	419.3	
11/29/2010	439.80		42.00	406.5		19.00	322.9		22.00	445.1		58.00	361.9		66.00	429.3	
12/30/2010	456.60		45.00	409.5		20.00	323.9		21.00	444.1		58.00	361.9		80.00	443.3	

Notes:

Elevations are in feet relative to NAVD88 datum.

**TABLE 3
SAN JOAQUIN DAM
PNEUMATIC PIEZOMETER MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017**

Pneumatic Piezo. No. ----->			C-6			C-7			C-8			C-9			RR-2		
Piezo. Tip Elevation ----->			392.0			324.9			440.6			357.0			393.2		
Zero Gage Reading ----->			27.5			21.0			17.5			53.1			29.9		
Date	Reservoir Elevation (feet)	comments	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment
2/1/2011	468.90		51.00	415.5		19.00	322.9		28.00	451.1		57.00	360.9		91.00	454.3	
2/23/2011	469.00		55.00	419.5		19.00	322.9		30.00	453.1		58.00	361.9		93.00	456.3	
3/29/2011	470.30		56.00	420.5		18.00	321.9		34.00	457.1		56.00	359.9		94.00	457.3	
4/27/2011	464.80		56.00	420.5		20.00	323.9		33.00	456.1		58.00	361.9		90.00	453.3	
5/26/2011	457.30		54.00	418.5		19.00	322.9		30.00	453.1		58.00	361.9		84.00	447.3	
6/28/2011	443.50		51.00	415.5		19.00	322.9		26.00	449.1		58.00	361.9		73.00	436.3	
7/29/2011	425.10		46.00	410.5		18.00	321.9		25.00	448.1		57.00	360.9		58.00	421.3	
8/24/2011	418.00		42.00	406.5		19.00	322.9		25.00	448.1		58.00	361.9		46.00	409.3	
9/27/2011	400.90		38.00	402.5		20.00	323.9		24.00	447.1		58.00	361.9		34.00	397.3	
10/26/2011	402.20		36.00	400.5		18.00	321.9		21.00	444.1		57.00	360.9		32.00	395.3	
11/30/2011	425.10		36.00	400.5		19.00	322.9		20.00	443.1		58.00	361.9		52.00	415.3	
12/21/2011	435.70		38.00	402.5		19.00	322.9		20.00	443.1		57.00	360.9		62.00	425.3	
1/24/2012	441.40		39.00	403.5		19.00	322.9		20.00	443.1		56.00	359.9		67.00	430.3	
2/28/2012	448.40		40.00	404.5		19.00	322.9		18.00	441.1		47.00	350.9		72.00	435.3	
3/26/2012	452.70		44.00	408.5		19.00	322.9		19.00	442.1		46.00	349.9		76.00	439.3	
4/23/2012	463.40		50.00	414.5		18.00	321.9		22.00	445.1		55.00	358.9		87.00	450.3	
5/30/2012	457.30		52.00	416.5		19.00	322.9		27.00	450.1		56.00	359.9		82.00	445.3	
6/13/2012	452.90		51.00	415.5		18.00	321.9		25.00	448.1		55.00	358.9		78.00	441.3	
6/26/2012	450.20		52.00	416.5		19.00	322.9		25.00	448.1		56.00	359.9		78.00	441.3	
7/24/2012	439.80		50.00	414.5		20.00	323.9		24.00	447.1		55.00	358.9		69.00	432.3	
8/8/2012	437.60		48.00	412.5		19.00	322.9		24.00	447.1		56.00	359.9		67.00	430.3	
8/22/2012	433.40		47.00	411.5		19.00	322.9		24.00	447.1		56.00	359.9		63.00	426.3	
8/29/2012	431.30		46.00	410.5		20.00	323.9		24.00	447.1		56.00	359.9		61.00	424.3	
9/25/2012	420.80		46.00	410.5		19.00	322.9		22.00	445.1		56.00	359.9		61.00	424.3	
10/31/2012	412.30		40.00	404.5		20.00	323.9		22.00	445.1		56.00	359.9		44.00	407.3	
11/27/2012	420.80		39.00	403.5		18.00	321.9		20.00	443.1		56.00	359.9		49.00	412.3	
12/18/2012	448.00		42.00	406.5		20.00	323.9		20.00	443.1		57.00	360.9		79.00	442.3	
1/29/2013	468.60		50.00	414.5		20.00	323.9		27.00	450.1		56.00	359.9		91.00	454.3	
2/28/2013	469.20		55.00	419.5		20.00	323.9		32.00	455.1		56.00	359.9		92.00	455.3	
3/27/2013	468.30		57.00	421.5		20.00	323.9		33.00	456.1		55.00	358.9		92.00	455.3	
4/25/2013	462.70		56.00	420.5		18.00	321.9		32.00	455.1		54.00	357.9		88.00	451.3	
5/21/2013	454.20		55.00	419.5		19.00	322.9		29.00	452.1		56.00	359.9		80.00	443.3	
6/25/2013	439.30		50.00	414.5		19.00	322.9		26.00	449.1		55.00	358.9		68.00	431.3	
7/23/2013	431.50		46.00	410.5		19.00	322.9		24.00	447.1		55.00	358.9		61.00	424.3	
8/21/2013	418.00		42.00	406.5		20.00	323.9		24.00	447.1		56.00	359.9		50.00	413.3	
9/24/2013	404.00		39.00	403.5		19.00	322.9		24.00	447.1		55.00	358.9		38.00	401.3	
10/29/2013	400.60		36.00	400.5		19.00	322.9		22.00	445.1		52.00	355.9		33.00	396.3	
11/26/2013	407.90		35.00	399.5		18.00	321.9		21.00	444.1		51.00	354.9		38.00	401.3	
12/19/2013	425.80		36.00	400.5		19.00	322.9		21.00	444.1		52.00	355.9		53.00	416.3	

Notes:
Elevations are in feet relative to NAVD88 datum.

**TABLE 3
SAN JOAQUIN DAM
PNEUMATIC PIEZOMETER MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017**

Pneumatic Piezo. No. ----->			C-6			C-7			C-8			C-9			RR-2		
Piezo. Tip Elevation ----->			392.0			324.9			440.6			357.0			393.2		
Zero Gage Reading ----->			27.5			21.0			17.5			53.1			29.9		
Date	Reservoir Elevation (feet)	comments	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment
1/28/2014	439.70		38.00	402.5		19.00	322.9		20.00	443.1		52.00	355.9		66.00	429.3	
2/25/2014	449.70		40.00	404.5		20.00	323.9		20.00	443.1		52.00	355.9		75.00	438.3	
3/26/2014	465.10		47.00	411.5		20.00	323.9		24.00	447.1		52.00	355.9		88.00	451.3	
3/28/2014	465.70		47.00	411.5		19.00	322.9		24.00	447.1		51.00	354.9		89.00	452.3	
4/29/2014	465.30		54.00	418.5		19.00	322.9		30.00	453.1		52.00	355.9		90.00	453.3	
5/28/2014	450.60		52.00	416.5		19.00	322.9		26.00	449.1		51.00	354.9		76.00	439.3	
6/25/2014	440.10		50.00	414.5		19.00	322.9		25.00	448.1		52.00	355.9		68.00	431.3	
7/29/2014	431.20		46.00	410.5		19.00	322.9		24.00	447.1		52.00	355.9		60.00	423.3	
8/26/2014	419.50		43.00	407.5		19.00	322.9		24.00	447.1		52.00	355.9		50.00	413.3	
9/23/2014	405.30		39.00	403.5		19.00	322.9		24.00	447.1		52.00	355.9		38.00	401.3	
10/29/2014	400.90		37.00	401.5		20.00	323.9		23.00	446.1		52.00	355.9		33.00	396.3	
11/25/2014	410.90		36.00	400.5		19.00	322.9		21.00	444.1		51.00	354.9		40.00	403.3	
12/30/2014	430.60		37.00	401.5		19.00	322.9		20.00	443.1		51.00	354.9		57.00	420.3	
1/27/2015	466.70		44.00	408.5		20.00	323.9		24.00	447.1		51.00	354.9		88.00	451.3	
2/25/2015	468.90		52.00	416.5		19.00	322.9		31.00	454.1		50.00	353.9		90.00	453.3	
3/26/2015	465.90		55.00	419.5		20.00	323.9		32.00	455.1		51.00	354.9		99.00	462.3	
4/28/2015	465.70		57.00	421.5		19.00	322.9		32.00	455.1		51.00	354.9		90.00	453.3	
5/28/2015	466.40		56.00	420.5		19.00	322.9		32.00	455.1		50.00	353.9		90.00	453.3	
6/30/2015	454.50		55.00	419.5		19.00	322.9		31.00	454.1		51.00	354.9		80.00	443.3	
7/28/2015	445.60		51.00	415.5		19.00	322.9		26.00	449.1		50.00	353.9		72.00	435.3	
8/28/2015	437.60		48.00	412.5		19.00	322.9		25.00	448.1		50.00	353.9		66.00	429.3	
9/24/2015	426.90		44.00	408.5		19.00	322.9		25.00	448.1		50.00	353.9		57.00	420.3	
10/27/2015	415.40		42.00	406.5		19.00	322.9		24.00	447.1		51.00	354.9		46.00	409.3	
11/19/2015	412.90		39.00	403.5		19.00	322.9		23.00	446.1		50.00	353.9		43.00	406.3	
12/22/2015	425.50		39.00	403.5		19.00	322.9		21.00	444.1		50.00	353.9		54.00	417.3	
1/27/2016	463.60		44.00	408.5		20.00	323.9		20.00	443.1		49.00	352.9		86.00	449.3	
2/25/2016	468.90		50.00	414.5		19.00	322.9		30.00	453.1		50.00	353.9		91.00	454.3	
3/30/2016	468.00		55.00	419.5		18.00	321.9		34.00	457.1		49.00	352.9		92.00	455.3	
4/28/2016	461.30		56.00	420.5		18.00	321.9		32.00	455.1		49.00	352.9		86.00	449.3	
5/25/2016	451.30		54.00	418.5		20.00	323.9		28.00	451.1		30.00	333.9		76.00	439.3	
6/28/2016	414.10		50.00	414.5		18.00	321.9		25.00	448.1		48.00	351.9		71.00	434.3	
7/27/2016	434.20		48.00	412.5		18.00	321.9		25.00	448.1		50.00	353.9		62.00	425.3	
8/23/2016	418.60		44.00	408.5		20.00	323.9		24.00	447.1		49.00	352.9		50.00	413.3	
9/27/2016	406.40		40.00	404.5		20.00	323.9		24.00	447.1		50.00	353.9		38.00	401.3	
10/26/2016	404.00		37.00	401.5		19.00	322.9		22.00	445.1		49.00	352.9		35.00	398.3	
11/22/2016	413.60		36.00	400.5		19.00	322.9		22.00	445.1		48.00	351.9		43.00	406.3	
12/20/2016	441.10		39.00	403.5		20.00	323.9		21.00	444.1		49.00	352.9		67.00	430.3	

Notes:
Elevations are in feet relative to NAVD88 datum.

**TABLE 3
SAN JOAQUIN DAM
PNEUMATIC PIEZOMETER MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017**

Pneumatic Piezo. No. ----->			C-6			C-7			C-8			C-9			RR-2		
Piezo. Tip Elevation ----->			392.0			324.9			440.6			357.0			393.2		
Zero Gage Reading ----->			27.5			21.0			17.5			53.1			29.9		
Date	Reservoir Elevation (feet)	comments	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment
1/26/2017	471.60		45.00	409.5		19.00	322.9		29.00	452.1		49.00	352.9		91.00	454.3	
2/24/2017	472.05		54.00	418.5		18.00	321.9		34.00	457.1		49.00	352.9		92.00	455.3	
2/25/2017	472.00																
2/26/2017	472.00																
2/27/2017	472.00		54.00	418.5		19.00	322.9		34.00	457.1		49.00	352.9		92.00	455.3	
2/28/2017	471.90		55.00	419.5		19.00	322.9		34.00	457.1		50.00	353.9		93.00	456.3	
3/1/2017	471.90		55.00	419.5		19.00	322.9		34.00	457.1		50.00	353.9		93.00	456.3	
3/2/2017	471.90		55.00	419.5		18.00	321.9		38.00	461.1		49.00	352.9		92.00	455.3	
3/29/2017	467.90		57.00	421.5		19.00	322.9		36.00	459.1		50.00	353.9		89.00	452.3	
4/27/2017	457.60		56.00	420.5		19.00	322.9		32.00	455.1		50.00	353.9		82.00	445.3	
5/23/2017	453.50		53.00	417.5		18.00	321.9		28.00	451.1		49.00	352.9		77.00	440.3	
6/21/2017	447.40		53.00	417.5		18.00	321.9		28.00	451.1		49.00	352.9		70.00	433.3	
7/26/2017	435.10		49.00	413.5		19.00	322.9		26.00	449.1		50.00	353.9		63.00	426.3	
8/25/2017	420.10		43.00	407.5		19.00	322.9		24.00	447.1		49.00	352.9		50.00	413.3	
9/27/2017	407.10		42.00	406.5		20.00	323.9		24.00	447.1		50.00	353.9		38.00	401.3	
10/26/2017	395.00		36.00	400.5		19.00	322.9		24.00	447.1		49.00	352.9		30.00	393.3	
11/28/2017	409.00		36.00	400.5		19.00	322.9		21.00	444.1		49.00	352.9		38.00	401.3	
12/20/2017	416.80		35.00	399.5		18.00	321.9		21.00	444.1		48.00	351.9		44.00	407.3	

Notes:
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**TABLE 3
SAN JOAQUIN DAM
PNEUMATIC PIEZOMETER MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017**

Pneumatic Piezo. No. ----->			LA-1			LA-2			RA-1			RA-2			RA-3		
Piezo. Tip Elevation ----->			391.2			440.3			364.5			354.3			390.8		
Zero Gage Reading ----->			27.3			17.6			61.0			51.0			26.9		
Date	Reservoir Elevation (feet)	comments	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment
1/3/2008	443.20		72.00	435.9		11.00	433.7		97.00	400.5		96.00	399.3		66.00	429.9	
1/29/2008	452.20		82.00	445.9		18.00	440.7		102.00	405.5		98.00	401.3		74.00	437.9	
2/27/2008	460.80		90.00	453.9		27.00	449.7		110.00	413.5		103.00	406.3		81.00	444.9	
3/26/2008	468.00		98.00	461.9		36.00	458.7		116.00	419.5		106.00	409.3		88.00	451.9	
4/29/2008	468.60		99.50	463.4		38.00	460.7		119.50	423.0		108.00	411.3		90.00	453.9	
5/29/2008	464.70		95.00	458.9		35.00	457.7		116.00	419.5		108.00	411.3		87.00	450.9	
6/26/2008	455.70		86.00	449.9		27.00	449.7		116.00	419.5		106.00	409.3		80.00	443.9	
7/29/2008	447.30		78.00	441.9		20.00	442.7		111.00	414.5		104.00	407.3		72.00	435.9	
8/28/2008	438.80		70.00	433.9		14.00	436.7		106.00	409.5		100.00	403.3		66.00	429.9	
9/26/2008	430.70		62.00	425.9		15.00	437.7		101.00	404.5		99.00	402.3		58.00	421.9	
10/29/2008	412.50		42.00	405.9		14.00	436.7		90.00	393.5		90.00	393.3		42.00	405.9	
11/25/2008	404.70		36.00	399.9		14.00	436.7		86.00	389.5		88.00	391.3		36.00	399.9	
12/30/2008	440.90		61.00	424.9		14.00	436.7		99.00	402.5		94.00	397.3		63.00	426.9	
1/28/2009	463.70		94.00	457.9		31.00	453.7		112.00	415.5		102.00	405.3		84.50	448.4	
2/25/2009	470.10		100.00	463.9		39.00	461.7		118.00	421.5		106.00	409.3		90.00	453.9	
3/26/2009	469.40		100.00	463.9		40.00	462.7		118.00	421.5		108.00	411.3		90.00	453.9	
4/29/2009	466.90		98.00	461.9		36.00	458.7		118.00	421.5		108.00	411.3		89.00	452.9	
5/18/2009	466.70		97.00	460.9		37.00	459.7		118.00	421.5		108.00	411.3		89.00	452.9	
5/29/2009	465.00		95.00	458.9		32.00	454.7		119.00	422.5		108.00	411.3		88.00	451.9	
6/30/2009	460.20		91.00	454.9		31.00	453.7		116.00	419.5		108.00	411.3		84.00	447.9	
7/30/2009	451.10		81.00	444.9		22.00	444.7		113.00	416.5		106.00	409.3		78.00	441.9	
8/25/2009	440.10		70.00	433.9		16.00	438.7		106.00	409.5		101.00	404.3		67.00	430.9	
9/30/2009	432.20		61.00	424.9		14.00	436.7		102.00	405.5		99.00	402.3		59.00	422.9	
10/29/2009	431.40		62.00	425.9		15.00	437.7		99.00	402.5		97.00	400.3		59.00	422.9	
12/1/2009	427.40		57.00	420.9		15.00	437.7		96.00	399.5		94.00	397.3		54.00	417.9	
12/29/2009	448.10		79.00	442.9		16.00	438.7		102.00	405.5		98.00	401.3		72.00	435.9	
1/27/2010	465.60		96.00	459.9		34.00	456.7		113.00	416.5		104.00	407.3		84.00	447.9	
2/25/2010	470.20		101.00	464.9		40.00	462.7		119.00	422.5		108.00	411.3		92.00	455.9	
3/29/2010	465.70		96.00	459.9		37.00	459.7		117.00	420.5		107.00	410.3		88.00	451.9	
4/4/2010	465.00		96.00	459.9		36.00	458.7		117.00	420.5		116.00	419.3		88.00	451.9	
4/27/2010	468.40		98.00	461.9		38.00	460.7		119.00	422.5		107.00	410.3		90.00	453.9	
5/27/2010	463.30		94.00	457.9		34.00	456.7		117.00	420.5		107.00	410.3		87.00	450.9	
6/30/2010	454.70		84.00	447.9		26.00	448.7		114.00	417.5		106.00	409.3		79.00	442.9	
7/28/2010	445.60		78.00	441.9		19.00	441.7		109.00	412.5		102.00	405.3		72.00	435.9	
8/31/2010	437.10		67.00	430.9		16.00	438.7		104.00	407.5		100.00	403.3		65.00	428.9	
9/29/2010	422.70		54.00	417.9		16.00	438.7		98.00	401.5		97.00	400.3		52.00	415.9	
10/27/2010	426.40		57.50	421.4		15.50	438.2		94.00	397.5		94.00	397.3		54.00	417.9	
11/29/2010	439.80		70.00	433.9		13.00	435.7		99.00	402.5		96.00	399.3		65.00	428.9	
12/30/2010	456.60		84.00	447.9		25.00	447.7		106.00	409.5		100.00	403.3		80.00	443.9	

Notes:
Elevations are in feet relative to NAVD88 datum.

TABLE 3
SAN JOAQUIN DAM
PNEUMATIC PIEZOMETER MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017

Pneumatic Piezo. No. ----->			LA-1			LA-2			RA-1			RA-2			RA-3		
Piezo. Tip Elevation ----->			391.2			440.3			364.5			354.3			390.8		
Zero Gage Reading ----->			27.3			17.6			61.0			51.0			26.9		
Date	Reservoir Elevation (feet)	comments	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment
2/1/2011	468.90		98.00	461.9		39.00	461.7		115.00	418.5		106.00	409.3		89.00	452.9	
2/23/2011	469.00		99.00	462.9		39.00	461.7		118.00	421.5		107.00	410.3		91.00	454.9	
3/29/2011	470.30		100.00	463.9		40.00	462.7		118.00	421.5		107.00	410.3		92.00	455.9	
4/27/2011	464.80		96.00	459.9		36.00	458.7		120.00	423.5		108.00	411.3		88.00	451.9	
5/26/2011	457.30		88.00	451.9		29.00	451.7		117.00	420.5		106.00	409.3		82.00	445.9	
6/28/2011	443.50		74.00	437.9		18.00	440.7		108.00	411.5		101.00	404.3		71.00	434.9	
7/29/2011	425.10		59.00	422.9		16.00	438.7		99.00	402.5		96.00	399.3		57.00	420.9	
8/24/2011	418.00		44.00	407.9		16.00	438.7		90.00	393.5		90.00	393.3		44.00	407.9	
9/27/2011	400.90		31.00	394.9		15.00	437.7		84.00	387.5		86.00	389.3		34.00	397.9	
10/26/2011	402.20		32.00	395.9		13.00	435.7		82.00	385.5		84.00	387.3		32.00	395.9	
11/30/2011	425.10		55.00	418.9		15.00	437.7		91.00	394.5		88.00	391.3		52.00	415.9	
12/21/2011	435.70		66.00	429.9		16.00	438.7		97.00	400.5		92.00	395.3		60.00	423.9	
1/24/2012	441.40		72.00	435.9		15.00	437.7		97.00	400.5		93.00	396.3		66.00	429.9	
2/28/2012	448.40		78.00	441.9		16.00	438.7		102.00	405.5		96.00	399.3		70.00	433.9	
3/26/2012	452.70		82.00	445.9		21.00	443.7		104.00	407.5		98.00	401.3		76.00	439.9	
4/23/2012	463.40		95.00	458.9		32.00	454.7		113.00	416.5		102.00	405.3		86.00	449.9	
5/30/2012	457.30		89.00	452.9		29.00	451.7		114.00	417.5		104.00	407.3		82.00	445.9	
6/13/2012	452.90		84.00	447.9		24.00	446.7		111.00	414.5		102.00	405.3		78.00	441.9	
6/26/2012	450.20		80.00	443.9		22.00	444.7		110.00	413.5		102.00	405.3		78.00	441.9	
7/24/2012	439.80		70.00	433.9		16.00	438.7		104.00	407.5		98.00	401.3		68.00	431.9	
8/8/2012	437.60		68.00	431.9		16.00	438.7		103.00	406.5		98.00	401.3		66.00	429.9	
8/22/2012	433.40		69.00	432.9		16.00	438.7		101.00	404.5		96.00	399.3		62.00	425.9	
8/29/2012	431.30		62.00	425.9		16.00	438.7		100.00	403.5		96.00	399.3		60.00	423.9	
9/25/2012	420.80		60.00	423.9		15.00	437.7		91.00	394.5		88.00	391.3		52.00	415.9	
10/31/2012	412.30		44.00	407.9		16.00	438.7		88.00	391.5		90.00	393.3		43.00	406.9	
11/27/2012	420.80		51.00	414.9		15.00	437.7		89.00	392.5		89.00	392.3		49.00	412.9	
12/18/2012	448.00		80.00	443.9		16.00	438.7		104.00	407.5		97.00	400.3		72.00	435.9	
1/29/2013	468.60		100.00	463.9		38.00	460.7		118.00	421.5		105.00	408.3		90.00	453.9	
2/28/2013	469.20		100.00	463.9		40.00	462.7		120.00	423.5		106.00	409.3		91.00	454.9	
3/27/2013	468.30		98.00	461.9		39.00	461.7		120.00	423.5		107.00	410.3		90.00	453.9	
4/25/2013	462.70		94.00	457.9		34.00	456.7		118.00	421.5		106.00	409.3		86.00	449.9	
5/21/2013	454.20		84.00	447.9		25.00	447.7		113.00	416.5		104.00	407.3		79.00	442.9	
6/25/2013	439.30		69.00	432.9		16.00	438.7		103.00	406.5		99.00	402.3		66.00	429.9	
7/23/2013	431.50		63.00	426.9		16.00	438.7		100.00	403.5		96.00	399.3		60.00	423.9	
8/21/2013	418.00		49.00	412.9		16.00	438.7		92.00	395.5		92.00	395.3		49.00	412.9	
9/24/2013	404.00		35.00	398.9		15.00	437.7		84.00	387.5		85.00	388.3		37.00	400.9	
10/29/2013	400.60		32.00	395.9		14.00	436.7		81.00	384.5		84.00	387.3		34.00	397.9	
11/26/2013	407.90		39.00	402.9		14.00	436.7		81.00	384.5		84.00	387.3		38.00	401.9	
12/19/2013	425.80		56.00	419.9		14.00	436.7		90.00	393.5		88.00	391.3		53.00	416.9	

Notes:

Elevations are in feet relative to NAVD88 datum.

**TABLE 3
SAN JOAQUIN DAM
PNEUMATIC PIEZOMETER MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017**

Pneumatic Piezo. No. ----->			LA-1			LA-2			RA-1			RA-2			RA-3		
Piezo. Tip Elevation ----->			391.2			440.3			364.5			354.3			390.8		
Zero Gage Reading ----->			27.3			17.6			61.0			51.0			26.9		
Date	Reservoir Elevation (feet)	comments	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment
1/28/2014	439.70		70.00	433.9		14.00	436.7		97.00	400.5		91.00	394.3		65.00	428.9	
2/25/2014	449.70		80.00	443.9		18.00	440.7		104.00	407.5		96.00	399.3		74.00	437.9	
3/26/2014	465.10		95.00	458.9		24.00	446.7		115.00	418.5		103.00	406.3		87.00	450.9	
3/28/2014	465.70		96.00	459.9		34.00	456.7		116.00	419.5		103.00	406.3		88.00	451.9	
4/29/2014	465.30		96.00	459.9		36.00	458.7		119.00	422.5		106.00	409.3		88.00	451.9	
5/28/2014	450.60		80.00	443.9		23.00	445.7		111.00	414.5		102.00	405.3		78.00	441.9	
6/25/2014	440.10		70.00	433.9		15.00	437.7		104.00	407.5		98.00	401.3		67.00	430.9	
7/29/2014	431.20		62.00	425.9		15.00	437.7		100.00	403.5		96.00	399.3		60.00	423.9	
8/26/2014	419.50		50.00	413.9		15.00	437.7		93.00	396.5		92.00	395.3		50.00	413.9	
9/23/2014	405.30		36.00	399.9		15.00	437.7		84.00	387.5		86.00	389.3		38.00	401.9	
10/29/2014	400.90		31.00	394.9		14.00	436.7		82.00	385.5		85.00	388.3		44.00	407.9	
11/25/2014	410.90		41.00	404.9		14.00	436.7		82.00	385.5		85.00	388.3		40.00	403.9	
12/30/2014	430.60		59.00	422.9		15.00	437.7		94.00	397.5		89.00	392.3		56.00	419.9	
1/27/2015	466.70		97.00	460.9		36.00	458.7		117.00	420.5		104.00	407.3		88.00	451.9	
2/25/2015	468.90		100.00	463.9		38.00	460.7		120.00	423.5		105.00	408.3		90.00	453.9	
3/26/2015	465.90		97.00	460.9		37.00	459.7		119.00	422.5		105.00	408.3		88.00	451.9	
4/28/2015	465.70		97.00	460.9		36.00	458.7		120.00	423.5		106.00	409.3		89.00	452.9	
5/28/2015	466.40		97.00	460.9		36.00	458.7		118.00	421.5		106.00	409.3		88.00	451.9	
6/30/2015	454.50		85.00	448.9		27.00	449.7		116.00	419.5		105.00	408.3		80.00	443.9	
7/28/2015	445.60		77.00	440.9		18.00	440.7		109.00	412.5		101.00	404.3		71.00	434.9	
8/28/2015	437.60		69.00	432.9		16.00	438.7		105.00	408.5		99.00	402.3		65.00	428.9	
9/24/2015	426.90		58.00	421.9		17.00	439.7		98.00	401.5		94.00	397.3		56.00	419.9	
10/27/2015	415.40		48.00	411.9		15.00	437.7		91.00	394.5		91.00	394.3		46.00	409.9	
11/19/2015	412.90		42.00	405.9		14.00	436.7		87.00	390.5		88.00	391.3		43.00	406.9	
12/22/2015	425.50		56.00	419.9		14.00	436.7		92.00	395.5		90.00	393.3		54.00	417.9	
1/27/2016	463.60		94.00	457.9		32.00	454.7		116.00	419.5		102.00	405.3		85.00	448.9	
2/25/2016	468.90		100.00	463.9		38.00	460.7		122.00	425.5		105.00	408.3		91.00	454.9	
3/30/2016	468.00		100.00	463.9		39.00	461.7		122.00	425.5		106.00	409.3		90.00	453.9	
4/28/2016	461.30		92.00	455.9		33.00	455.7		120.00	423.5		104.00	407.3		84.00	447.9	
5/25/2016	451.30		80.00	443.9		23.00	445.7		114.00	417.5		102.00	405.3		76.00	439.9	
6/28/2016	414.10		73.00	436.9		17.00	439.7		108.00	411.5		100.00	403.3		70.00	433.9	
7/27/2016	434.20		66.00	429.9		16.00	438.7		103.00	406.5		97.00	400.3		62.00	425.9	
8/23/2016	418.60		50.00	413.9		15.00	437.7		83.00	386.5		91.00	394.3		49.00	412.9	
9/27/2016	406.40		36.00	399.9		16.00	438.7		86.00	389.5		86.00	389.3		38.00	401.9	
10/26/2016	404.00		33.00	396.9		16.00	438.7		82.00	385.5		83.00	386.3		34.00	397.9	
11/22/2016	413.60		44.00	407.9		14.00	436.7		86.00	389.5		85.00	388.3		42.00	405.9	
12/20/2016	441.10		71.00	434.9		14.00	436.7		102.00	405.5		93.00	396.3		66.00	429.9	

Notes:
Elevations are in feet relative to NAVD88 datum.

**TABLE 3
SAN JOAQUIN DAM
PNEUMATIC PIEZOMETER MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017**

Pneumatic Piezo. No. ----->			LA-1			LA-2			RA-1			RA-2			RA-3		
Piezo. Tip Elevation ----->			391.2			440.3			364.5			354.3			390.8		
Zero Gage Reading ----->			27.3			17.6			61.0			51.0			26.9		
Date	Reservoir Elevation (feet)	comments	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment
1/26/2017	471.60		102.00	465.9		41.00	463.7		123.00	426.5		104.00	407.3		91.00	454.9	
2/24/2017	472.05		104.00	467.9		42.00	464.7		125.00	428.5		106.00	409.3		92.00	455.9	
2/25/2017	472.00																
2/26/2017	472.00																
2/27/2017	472.00		103.00	466.9		42.00	464.7		125.00	428.5		106.00	409.3		92.00	455.9	
2/28/2017	471.90		104.00	467.9		42.00	464.7		125.00	428.5		106.00	409.3		92.00	455.9	
3/1/2017	471.90		104.00	467.9		42.00	464.7		126.00	429.5		106.00	409.3		93.00	456.9	
3/2/2017	471.90		104.00	467.9		40.00	462.7		126.00	429.5		106.00	409.3		92.00	455.9	
3/29/2017	467.90		100.00	463.9		38.00	460.7		124.00	427.5		106.00	409.3		90.00	453.9	
4/27/2017	457.60		89.00	452.9		29.00	451.7		118.00	421.5		104.00	407.3		82.00	445.9	
5/23/2017	453.50		85.00	448.9		25.00	447.7		105.00	408.5		102.00	405.3		78.00	441.9	
6/21/2017	447.40		80.00	443.9		17.00	439.7		111.00	414.5		102.00	405.3		70.00	433.9	
7/26/2017	435.10		67.00	430.9		16.00	438.7		103.00	406.5		97.00	400.3		63.00	426.9	
8/25/2017	420.10		50.00	413.9		15.00	437.7		93.00	396.5		91.00	394.3		49.00	412.9	
9/27/2017	407.10		40.00	403.9		15.00	437.7		86.00	389.5		87.00	390.3		38.00	401.9	
10/26/2017	395.00		24.00	387.9		15.00	437.7		77.00	380.5		80.00	383.3		27.00	390.9	
11/28/2017	409.00		39.00	402.9		13.00	435.7		82.00	385.5		82.00	385.3		38.00	401.9	
12/20/2017	416.80		47.00	410.9		14.00	436.7		87.00	390.5		84.00	387.3		44.00	407.9	

Notes:
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**TABLE 3
SAN JOAQUIN DAM
PNEUMATIC PIEZOMETER MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017**

Pneumatic Piezo. No. ----->			RA-4			LR-1			LR-2			LR-3			LR-4		
Piezo. Tip Elevation ----->			441.0			356.3			340.3			390.1			440.0		
Zero Gage Reading ----->			18.0			53.6			37.6			26.8			17.0		
Date	Reservoir Elevation (feet)	comments	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment
1/3/2008	443.20		14.00	437.0		59.00	361.7		46.00	348.7		78.00	441.3		12.00	435.0	
1/29/2008	452.20		16.00	439.0		59.00	361.7		46.00	348.7		86.00	449.3		22.00	445.0	
2/27/2008	460.80					59.00	361.7		47.00	349.7		96.00	459.3		31.00	454.0	
3/26/2008	468.00					59.00	361.7		47.00	349.7		102.00	465.3		36.00	459.0	
4/29/2008	468.60					59.50	362.2		47.80	350.5		104.00	467.3		40.00	463.0	
5/29/2008	464.70					59.00	361.7		47.00	349.7		100.00	463.3		36.00	459.0	
6/26/2008	455.70					59.00	361.7		48.00	350.7		90.00	453.3		26.00	449.0	
7/29/2008	447.30					59.00	361.7		48.00	350.7		81.00	444.3		19.00	442.0	
8/28/2008	438.80					60.00	362.7		50.00	352.7		74.00	437.3		12.00	435.0	
9/26/2008	430.70					62.00	364.7		49.00	351.7		65.00	428.3		13.00	436.0	
10/29/2008	412.50					60.00	362.7		48.00	350.7		44.00	407.3		12.00	435.0	
11/25/2008	404.70					60.00	362.7		48.00	350.7		36.00	399.3		12.00	435.0	
12/30/2008	440.90					60.00	362.7		48.00	350.7		75.00	438.3		12.00	435.0	
1/28/2009	463.70					60.50	363.2		48.00	350.7		98.00	461.3		34.00	457.0	
2/25/2009	470.10					61.00	363.7		49.00	351.7		105.00	468.3		36.00	459.0	
3/26/2009	469.40					62.00	364.7		50.00	352.7		105.00	468.3		40.50	463.5	
4/29/2009	466.90					62.00	364.7		49.00	351.7		102.00	465.3		38.00	461.0	
5/18/2009	466.70					63.00	365.7		50.00	352.7		102.00	465.3		38.00	461.0	
5/29/2009	465.00					60.00	362.7		50.00	352.7		100.00	463.3		35.00	458.0	
6/30/2009	460.20					62.00	364.7		50.00	352.7		95.00	458.3		31.00	454.0	
7/30/2009	451.10					63.00	365.7		51.00	353.7		86.00	449.3		22.00	445.0	
8/25/2009	440.10					62.00	364.7		51.00	353.7		74.00	437.3		14.00	437.0	
9/30/2009	432.20					62.00	364.7		50.00	352.7		64.00	427.3		11.00	434.0	
10/29/2009	431.40					64.00	366.7		51.00	353.7		65.00	428.3		12.00	435.0	
12/1/2009	427.40					63.00	365.7		50.00	352.7		60.00	423.3		11.00	434.0	
12/29/2009	448.10					64.00	366.7		50.00	352.7		82.00	445.3		16.00	439.0	
1/27/2010	465.60					64.00	366.7		51.00	353.7		102.00	465.3		36.00	459.0	
2/25/2010	470.20					64.00	366.7		51.00	353.7		106.00	469.3		37.00	460.0	
3/29/2010	465.70					65.00	367.7		51.00	353.7		101.00	464.3		37.00	460.0	
4/4/2010	465.00					65.00	367.7		52.00	354.7		100.00	463.3		36.00	459.0	
4/27/2010	468.40					64.00	366.7		51.00	353.7		103.00	466.3		36.00	459.0	
5/27/2010	463.30					64.00	366.7		52.00	354.7		99.00	462.3		34.00	457.0	
6/30/2010	454.70					64.00	366.7		52.00	354.7		89.00	452.3		24.00	447.0	
7/28/2010	445.60					65.00	367.7		52.00	354.7		80.00	443.3		16.00	439.0	
8/31/2010	437.10					65.00	367.7		52.00	354.7		71.00	434.3		12.00	435.0	
9/29/2010	422.70					65.00	367.7		51.00	353.7		56.00	419.3		12.00	435.0	
10/27/2010	426.40					65.00	367.7		52.00	354.7		60.00	423.3		12.00	435.0	
11/29/2010	439.80					64.00	366.7		51.00	353.7		74.00	437.3		10.00	433.0	
12/30/2010	456.60					65.00	367.7		52.00	354.7		92.00	455.3		26.00	449.0	

Notes:
Elevations are in feet relative to NAVD88 datum.

**TABLE 3
SAN JOAQUIN DAM
PNEUMATIC PIEZOMETER MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017**

Pneumatic Piezo. No. ----->			RA-4			LR-1			LR-2			LR-3			LR-4		
Piezo. Tip Elevation ----->			441.0			356.3			340.3			390.1			440.0		
Zero Gage Reading ----->			18.0			53.6			37.6			26.8			17.0		
Date	Reservoir Elevation (feet)	comments	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment
2/1/2011	468.90					67.00	369.7		52.00	354.7		102.00	465.3		37.00	460.0	
2/23/2011	469.00					67.00	369.7		52.00	354.7		105.00	468.3		38.00	461.0	
3/29/2011	470.30					66.00	368.7		52.00	354.7		106.00	469.3		40.00	463.0	
4/27/2011	464.80					67.00	369.7		52.00	354.7		100.00	463.3		36.00	459.0	
5/26/2011	457.30					67.00	369.7		53.00	355.7		92.00	455.3		29.00	452.0	
6/28/2011	443.50					67.00	369.7		53.00	355.7		78.00	441.3		16.00	439.0	
7/29/2011	425.10					66.00	368.7		52.00	354.7		62.00	425.3		10.00	433.0	
8/24/2011	418.00					66.00	368.7		51.00	353.7		44.00	407.3		12.00	435.0	
9/27/2011	400.90		16.00	439.0		64.00	366.7		50.00	352.7		32.00	395.3		12.00	435.0	
10/26/2011	402.20		10.00	433.0		64.00	366.7		50.00	352.7		32.00	395.3		10.00	433.0	
11/30/2011	425.10		11.00	434.0		63.00	365.7		51.00	353.7		58.00	421.3		12.00	435.0	
12/21/2011	435.70		13.00	436.0		64.00	366.7		51.00	353.7		69.00	432.3		12.00	435.0	
1/24/2012	441.40		10.00	433.0		64.00	366.7		50.00	352.7		75.00	438.3		11.00	434.0	
2/28/2012	448.40		14.00	437.0		62.00	364.7		50.00	352.7		80.00	443.3		16.00	439.0	
3/26/2012	452.70		15.00	438.0		64.00	366.7		50.00	352.7		83.00	446.3		21.00	444.0	
4/23/2012	463.40		0.00	423.0		64.00	366.7		50.00	352.7		99.00	462.3		30.00	453.0	
5/30/2012	457.30		0.00	423.0		65.00	367.7		51.00	353.7		92.00	455.3		28.00	451.0	
6/13/2012	452.90		0.00	423.0		65.00	367.7		50.00	352.7		88.00	451.3		24.00	447.0	
6/26/2012	450.20		0.00	423.0		64.00	366.7		50.00	352.7		86.00	449.3		22.00	445.0	
7/24/2012	439.80		0.00	423.0		64.00	366.7		50.00	352.7		75.00	438.3		14.00	437.0	
8/8/2012	437.60		0.00	423.0		64.00	366.7		51.00	353.7		72.00	435.3		12.00	435.0	
8/22/2012	433.40		0.00	423.0		65.00	367.7		50.00	352.7		67.00	430.3		16.00	439.0	
8/29/2012	431.30		0.00	423.0		65.00	367.7		50.00	352.7		66.00	429.3		12.00	435.0	
9/25/2012	420.80		11.00	434.0		63.00	365.7		51.00	353.7		58.00	421.3		12.00	435.0	
10/31/2012	412.30		14.00	437.0		64.00	366.7		50.00	352.7		44.00	407.3		12.00	435.0	
11/27/2012	420.80		15.00	438.0		62.00	364.7		50.00	352.7		51.00	414.3		11.00	434.0	
12/18/2012	448.00		11.00	434.0		64.00	366.7		50.00	352.7		81.00	444.3		15.00	438.0	
1/29/2013	468.60		0.00	423.0		66.00	368.7		50.00	352.7		104.00	467.3		38.00	461.0	
2/28/2013	469.20		0.00	423.0		67.00	369.7		52.00	354.7		105.00	468.3		39.00	462.0	
3/27/2013	468.30		0.00	423.0		66.00	368.7		51.00	353.7		104.00	467.3		38.00	461.0	
4/25/2013	462.70		0.00	423.0		64.00	366.7		50.00	352.7		98.00	461.3		34.00	457.0	
5/21/2013	454.20		0.00	423.0		66.00	368.7		52.00	354.7		89.00	452.3		26.00	449.0	
6/25/2013	439.30		0.00	423.0		66.00	368.7		51.00	353.7		74.00	437.3		12.00	435.0	
7/23/2013	431.50		0.00	423.0		66.00	368.7		51.00	353.7		65.00	428.3		10.00	433.0	
8/21/2013	418.00		0.00	423.0		66.00	368.7		51.00	353.7		52.00	415.3		11.00	434.0	
9/24/2013	404.00		17.00	440.0		64.00	366.7		50.00	352.7		37.00	400.3		11.00	434.0	
10/29/2013	400.60		16.00	439.0		64.00	366.7		50.00	352.7		33.00	396.3		10.00	433.0	
11/26/2013	407.90		14.00	437.0		63.00	365.7		48.00	350.7		40.00	403.3		11.00	434.0	
12/19/2013	425.80		11.00	434.0		63.00	365.7		50.00	352.7		59.00	422.3		11.00	434.0	

Notes:
Elevations are in feet relative to NAVD88 datum.

**TABLE 3
SAN JOAQUIN DAM
PNEUMATIC PIEZOMETER MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017**

Pneumatic Piezo. No. ----->			RA-4			LR-1			LR-2			LR-3			LR-4		
Piezo. Tip Elevation ----->			441.0			356.3			340.3			390.1			440.0		
Zero Gage Reading ----->			18.0			53.6			37.6			26.8			17.0		
Date	Reservoir Elevation (feet)	comments	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment
1/28/2014	439.70		12.00	435.0		64.00	366.7		50.00	352.7		73.00	436.3		10.00	433.0	
2/25/2014	449.70		16.00	439.0		63.00	365.7		50.00	352.7		84.00	447.3		20.00	443.0	
3/26/2014	465.10		0.00	423.0		65.00	367.7		51.00	353.7		100.00	463.3		37.00	460.0	
3/28/2014	465.70		0.00	423.0		65.00	367.7		50.00	352.7		101.00	464.3		38.00	461.0	
4/29/2014	465.30		0.00	423.0		66.00	368.7		51.00	353.7		102.00	465.3		38.00	461.0	
5/28/2014	450.60		0.00	423.0		65.00	367.7		51.00	353.7		86.00	449.3		24.00	447.0	
6/25/2014	440.10		0.00	423.0		65.00	367.7		50.00	352.7		77.00	440.3		14.00	437.0	
7/29/2014	431.20		0.00	423.0		65.00	367.7		50.00	352.7		65.00	428.3		11.00	434.0	
8/26/2014	419.50		0.00	423.0		66.00	368.7		50.00	352.7		53.00	416.3		11.00	434.0	
9/23/2014	405.30		15.00	438.0		65.00	367.7		49.00	351.7		37.00	400.3		10.00	433.0	
10/29/2014	400.90		16.00	439.0		64.00	366.7		50.00	352.7		33.00	396.3		10.00	433.0	
11/25/2014	410.90		18.00	441.0		63.00	365.7		49.00	351.7		43.00	406.3		10.00	433.0	
12/30/2014	430.60		11.00	434.0		63.00	365.7		49.00	351.7		62.00	425.3		10.00	433.0	
1/27/2015	466.70		0.00	423.0		65.00	367.7		50.00	352.7		101.00	464.3		36.00	459.0	
2/25/2015	468.90		0.00	423.0		66.00	368.7		50.00	352.7		103.00	466.3		42.00	465.0	
3/26/2015	465.90		0.00	423.0		66.00	368.7		51.00	353.7		101.00	464.3		39.00	462.0	
4/28/2015	465.70		0.00	423.0		66.00	368.7		51.00	353.7		102.00	465.3		39.00	462.0	
5/28/2015	466.40		0.00	423.0		66.00	368.7		52.00	354.7		102.00	465.3		38.00	461.0	
6/30/2015	454.50		0.00	423.0		67.00	369.7		52.00	354.7		90.00	453.3		27.00	450.0	
7/28/2015	445.60		0.00	423.0		65.00	367.7		51.00	353.7		80.00	443.3		19.00	442.0	
8/28/2015	437.60		0.00	423.0		67.00	369.7		52.00	354.7		73.00	436.3		12.00	435.0	
9/24/2015	426.90		0.00	423.0		65.00	367.7		51.00	353.7		60.00	423.3		10.00	433.0	
10/27/2015	415.40		0.00	423.0		66.00	368.7		52.00	354.7		48.00	411.3		11.00	434.0	
11/19/2015	412.90		17.00	440.0		65.00	367.7		51.00	353.7		45.00	408.3		10.00	433.0	
12/22/2015	425.50		12.00	435.0		65.00	367.7		51.00	353.7		59.00	422.3		10.00	433.0	
1/27/2016	463.60		0.00	423.0		66.00	368.7		52.00	354.7		99.00	462.3		36.00	459.0	
2/25/2016	468.90		0.00	423.0		66.00	368.7		52.00	354.7		105.00	468.3		42.00	465.0	
3/30/2016	468.00		0.00	423.0		66.00	368.7		52.00	354.7		104.00	467.3		42.00	465.0	
4/28/2016	461.30		0.00	423.0		66.00	368.7		52.00	354.7		96.00	459.3		34.00	457.0	
5/25/2016	451.30		0.00	423.0		66.00	368.7		52.00	354.7		86.00	449.3		24.00	447.0	
6/28/2016	414.10		0.00	423.0		66.00	368.7		52.00	354.7		78.00	441.3		17.00	440.0	
7/27/2016	434.20		0.00	423.0		65.00	367.7		52.00	354.7		68.00	431.3		11.00	434.0	
8/23/2016	418.60		0.00	423.0		66.00	368.7		52.00	354.7		52.00	415.3		10.00	433.0	
9/27/2016	406.40		12.00	435.0		66.00	368.7		51.00	353.7		39.00	402.3		10.00	433.0	
10/26/2016	404.00		14.00	437.0		64.00	366.7		54.00	356.7		36.00	399.3		8.00	431.0	
11/22/2016	413.60		14.00	437.0		64.00	366.7		50.00	352.7		46.00	409.3		7.00	430.0	
12/20/2016	441.10		16.00	439.0		64.00	366.7		51.00	353.7		75.00	438.3		8.00	431.0	

Notes:
Elevations are in feet relative to NAVD88 datum.

**TABLE 3
SAN JOAQUIN DAM
PNEUMATIC PIEZOMETER MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017**

Pneumatic Piezo. No. ----->			RA-4			LR-1			LR-2			LR-3			LR-4		
Piezo. Tip Elevation ----->			441.0			356.3			340.3			390.1			440.0		
Zero Gage Reading ----->			18.0			53.6			37.6			26.8			17.0		
Date	Reservoir Elevation (feet)	comments	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment	read. (ft of H ₂ O)	elevation (ft)	comment
1/26/2017	471.60		0.00	423.0		66.00	368.7		51.00	353.7		105.00	468.3		41.00	464.0	
2/24/2017	472.05		0.00	423.0		66.00	368.7		52.00	354.7		108.00	471.3		44.00	467.0	
2/25/2017	472.00																
2/26/2017	472.00																
2/27/2017	472.00		0.00	423.0		67.00	369.7		52.00	354.7		107.00	470.3		43.00	466.0	
2/28/2017	471.90		0.00	423.0		67.00	369.7		53.00	355.7		107.00	470.3		44.00	467.0	
3/1/2017	471.90		0.00	423.0		67.00	369.7		52.00	354.7		108.00	471.3		43.00	466.0	
3/2/2017	471.90		0.00	423.0		67.00	369.7		52.00	354.7		108.00	471.3		43.00	466.0	
3/29/2017	467.90		0.00	423.0		67.00	369.7		53.00	355.7		102.00	465.3		38.00	461.0	
4/27/2017	457.60		0.00	423.0		67.00	369.7		53.00	355.7		93.00	456.3		28.00	451.0	
5/23/2017	453.50		0.00	423.0		66.00	368.7		52.00	354.7		88.00	451.3		23.00	446.0	
6/21/2017	447.40		0.00	423.0		64.00	366.7		52.00	354.7		80.00	443.3		15.00	438.0	
7/26/2017	435.10		0.00	423.0		67.00	369.7		52.00	354.7		70.00	433.3		10.00	433.0	
8/25/2017	420.10		0.00	423.0		66.00	368.7		52.00	354.7		53.00	416.3		9.00	432.0	
9/27/2017	407.10		0.00	423.0		66.00	368.7		52.00	354.7		40.00	403.3		8.00	431.0	
10/26/2017	395.00		14.00	437.0		65.00	367.7		51.00	353.7		24.00	387.3		6.00	429.0	
11/28/2017	409.00		12.00	435.0		62.00	364.7		50.00	352.7		41.00	404.3		5.00	428.0	
12/20/2017	416.80		13.00	436.0		64.00	366.7		50.00	352.7		46.00	409.3		6.00	429.0	

Notes:
Elevations are in feet relative to NAVD88 datum.

TABLE 4
SAN JOAQUIN DAM
SEEPAGE WEIR MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017

Seepage Weir ----->		East Drain			West Drain			Filter Drain			U/S Collector Drain #1			U/S Collector Drain #2		
Date	Reservoir Elevation (feet)	read. (ft)	flow (gpm)	comment	read. (ft)	flow (gpm)	comment	read. (ft)	flow (gpm)	comment	read. (ft)	flow (gpm)	comment	read. (ft)	flow (gpm)	comment
1/3/2008	443.20	3.20	15.37		0.28	48.75		2.00	4.93		0.00	0.00	dry	0.00	0.00	dry
1/29/2008	452.20	3.80	23.29		0.30	57.80		2.20	6.21		0.00	0.00	dry	0.00	0.00	dry
2/27/2008	460.80	4.20	29.68		0.34	78.74		2.20	6.21		0.00	0.00	dry	0.00	0.00	dry
3/26/2008	468.00	4.60	36.99		0.40	117.64		2.00	4.93		0.00	0.00	dry	0.00	0.00	dry
4/29/2008	468.60		57.00			69.70		2.00	4.93		0.00	0.00	dry	0.00	0.00	dry
5/29/2008	464.70		50.00			68.10		0.18	0.01		0.00	0.00	dry	0.00	0.00	dry
6/26/2008	455.70		43.50			60.00			1.12		0.00	0.00	dry	0.00	0.00	dry
7/29/2008	447.30		39.60			35.27			1.00		0.00	0.00	dry	0.00	0.00	dry
8/28/2008	438.80		29.00			46.00			0.37		0.00	0.00	dry	0.00	0.00	dry
9/26/2008	430.70		23.93			38.58			10.27		0.00	0.00	dry	0.00	0.00	dry
10/29/2008	412.50		11.00			25.26			9.94		0.00	0.00	dry	0.00	0.00	dry
11/25/2008	404.70		10.40			28.50			9.20		0.00	0.00	dry	0.00	0.00	dry
12/30/2008	440.90		36.00			42.79			11.56		0.00	0.00	dry	0.00	0.00	dry
1/28/2009	463.70		105.70			79.30			9.90		0.00	0.00	dry	0.00	0.00	dry
2/25/2009	470.10		52.30			53.63			10.10		0.00	0.00	dry	0.00	0.00	dry
3/26/2009	469.40		63.40			79.30			12.29		0.00	0.00	dry	0.00	0.00	dry
4/29/2009	466.90		46.09			81.12			11.03		0.00	0.00	dry	0.00	0.00	dry
5/18/2009	466.70		60.00			75.00			12.00		0.00	0.00	dry	0.00	0.00	dry
5/29/2009	465.00		61.30			72.30			12.30		0.00	0.00	dry	0.00	0.00	dry
6/30/2009	460.20		55.10			69.60			12.50		0.00	0.00	dry	0.00	0.00	dry
7/30/2009	451.10		44.95			59.40			12.75			0.13		0.00	0.00	dry
8/25/2009	440.10		34.11			50.70			13.19			0.00	dry	0.00	0.00	dry
9/30/2009	432.20		26.10			41.20			12.20			0.00	dry	0.00	0.00	dry
10/29/2009	431.40		22.36			37.12			11.05			0.00	dry	0.00	0.00	dry
12/1/2009	427.40		19.67			32.43			11.31			0.00	dry	0.00	0.00	dry
12/29/2009	448.10		32.52			43.41			10.38			0.00	dry	0.00	0.00	dry
1/27/2010	465.60		54.82			67.12			11.55			0.00	dry	0.00	0.00	dry
2/25/2010	470.20		61.60			76.90			12.20			0.00	dry	0.00	0.00	dry
3/29/2010	465.70		56.91			71.73			12.14			0.00	dry		0.20	
4/4/2010	465.00		55.00			69.40			11.20			0.26			0.00	dry
4/27/2010	468.40		62.10			70.70			11.90			0.00	dry		0.00	dry
5/27/2010	463.30		47.80			65.00			11.90			0.55			0.00	dry
6/30/2010	454.70		54.37			63.75			12.25			0.50			0.00	dry
7/28/2010	445.60		44.00			55.00			13.00			0.40			0.00	dry
8/31/2010	437.10		38.94			47.95			12.49			0.27			0.00	dry
9/29/2010	422.70		28.10			38.00			11.40			0.23			0.00	dry
10/27/2010	426.40		26.50			37.00			11.40			0.15			0.00	dry
11/29/2010	439.80		34.27			41.64			10.67			0.00			0.00	dry
12/30/2010	456.60		34.00			46.00			11.00			0.00			0.00	dry

Note:
Elevations are in feet relative to NAVD88 datum.

**TABLE 4
SAN JOAQUIN DAM
SEEPAGE WEIR MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017**

Seepage Weir ----->		East Drain			West Drain			Filter Drain			U/S Collector Drain #1			U/S Collector Drain #2		
Date	Reservoir Elevation (feet)	read. (ft)	flow (gpm)	comment	read. (ft)	flow (gpm)	comment	read. (ft)	flow (gpm)	comment	read. (ft)	flow (gpm)	comment	read. (ft)	flow (gpm)	comment
2/1/2011	468.90		58.00			71.00			11.50			0.26			0.00	dry
2/23/2011	469.00		60.03			71.80			12.66			0.26			0.00	dry
3/29/2011	470.30		61.50			74.90			12.90			0.53			0.00	dry
4/27/2011	464.80		39.94			58.62			9.98			0.70			0.00	dry
5/26/2011	457.30		34.00			51.20			9.93			0.61			0.00	dry
6/28/2011	443.50		26.50			43.91			10.35			0.52			0.00	dry
7/29/2011	425.10		18.96			35.15			10.34			0.40			0.00	dry
8/24/2011	418.00		13.42			27.08			10.37			0.00			0.20	
9/27/2011	400.90		9.18			20.55			10.18			0.00			0.00	
10/26/2011	402.20		8.14			18.73			9.58			0.00			0.00	
11/30/2011	425.10		13.11			26.33			9.28			0.00			0.00	
12/21/2011	435.70		18.45			32.30			9.09			0.00			0.00	
1/24/2012	441.40		19.51			37.32			8.90			0.00			0.00	
2/28/2012	448.40		21.40			40.90			8.60			0.00			0.00	
3/26/2012	452.70		23.14			43.41			8.65			0.00			0.00	
4/23/2012	463.40		39.54			56.48			8.34			0.00			0.00	
5/30/2012	457.30		35.45			55.39			8.72			0.00			0.00	
6/13/2012	452.90		31.31			51.82			8.53			0.00			0.00	
6/26/2012	450.20		29.30			49.60			8.90			0.00			0.00	
7/24/2012	439.80		22.25			42.76			8.79			0.00			0.00	
8/8/2012	437.60		20.94			40.38			8.91			0.00			0.00	
8/22/2012	433.40		19.79			35.01			9.23			0.00			0.00	
8/29/2012	431.30		19.10			32.62			8.10			0.00			0.00	
9/25/2012	420.80		15.38			26.33			7.90			0.00			0.00	
10/31/2012	412.30		10.48			21.63			7.77			0.00			0.00	
11/27/2012	420.80		12.00			24.50			8.00			0.00			0.00	
12/18/2012	448.00		31.81			27.29			8.07			0.00			0.00	
1/29/2013	468.60		60.00			56.70			7.90			0.00			0.00	
2/28/2013	469.20		62.57			60.52			7.92			0.00			0.00	
3/27/2013	468.30		56.89			67.68			7.92			0.00			0.00	
4/25/2013	462.70		51.59			59.13			7.92			0.00			0.00	
5/21/2013	454.20		40.10			46.50			7.92			0.00			0.00	
6/25/2013	439.30		27.97			36.61			7.51			0.00			0.00	
7/23/2013	431.50		22.44			30.45			7.04			0.00			0.00	

Note:
Elevations are in feet relative to NAVD88 datum.

**TABLE 4
SAN JOAQUIN DAM
SEEPAGE WEIR MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017**

Seepage Weir ----->		East Drain			West Drain			Filter Drain			U/S Collector Drain #1			U/S Collector Drain #2		
Date	Reservoir Elevation (feet)	read. (ft)	flow (gpm)	comment	read. (ft)	flow (gpm)	comment	read. (ft)	flow (gpm)	comment	read. (ft)	flow (gpm)	comment	read. (ft)	flow (gpm)	comment
8/21/2013	418.00		15.80			23.60			6.34			0.00			0.00	
9/24/2013	404.00		11.15			19.46			6.34			0.00			0.00	
10/29/2013	400.60		8.70			16.17			6.89			0.00			0.00	
11/26/2013	407.90		8.19			15.80			6.34			0.00			0.00	
12/19/2013	425.80		16.15			22.45			5.28			0.00			0.00	
1/28/2014	439.70		24.89			31.46			7.90			0.00			0.00	
2/25/2014	449.70		30.84			38.79			7.20			0.00			0.00	
3/26/2014	465.10		48.97			55.26			7.92			0.00			0.00	
3/28/2014	465.70		48.66			55.41			6.44			0.00			0.00	
4/29/2014	465.30		50.10			57.60			7.51			0.00			0.00	
5/28/2014	450.60		34.05			46.03			7.08			0.00			0.00	
6/25/2014	440.10		30.19			39.64			6.34			0.00			0.00	
7/29/2014	431.20		24.97			33.85			6.49			0.00			0.00	
8/26/2014	419.50		19.12			27.02			10.56			0.00			0.00	
9/23/2014	405.30		13.04			21.32			6.30			0.00			0.00	
10/29/2014	400.90		10.06			18.54			6.15			0.00			0.00	
11/25/2014	410.90		10.75			18.60			6.34			0.00			0.00	
12/30/2014	430.60		23.26			26.64			6.34			0.00			0.00	
1/27/2015	466.70		61.45			60.49			7.04			0.00			0.00	
2/25/2015	468.90		63.90			64.50			6.30			0.00			0.00	
3/26/2015	465.90		62.14			63.40			7.20			0.00			0.00	
4/28/2015	465.70		60.10			59.60			5.70			0.00			0.00	
5/28/2015	466.40		54.04			49.61			5.34			0.00			0.00	
6/30/2015	454.50		44.81			43.46			4.30			0.00			0.00	
7/28/2015	445.60		35.40			35.90			6.30			0.00			0.00	
8/28/2015	437.60		29.20			30.40			6.30			0.00			0.00	
9/24/2015	426.90		23.50			25.10			6.34			0.00			0.00	
10/27/2015	415.40		16.90			18.70			6.30			0.00			0.00	
11/19/2015	412.90		14.23			16.38			6.56			0.00			0.00	
12/22/2015	425.50		19.50			19.40			5.86			0.00			0.00	
1/27/2016	463.60		53.20			42.08			6.34			0.00			0.00	
2/25/2016	468.90		59.37			50.05			7.33			0.00			0.00	
3/30/2016	468.00		56.40			50.90			6.20			0.00			0.00	
4/28/2016	461.30		50.83			46.75			6.73			0.00			0.00	
5/25/2016	451.30		43.06			40.29			7.17			0.00			0.00	
6/28/2016	414.10		34.98			34.83			6.68			0.00			0.00	
7/27/2016	434.20		28.20			29.30			6.60			0.00			0.00	
8/23/2016	418.60		18.96			20.95			6.53			0.00			0.00	
9/27/2016	406.40		13.04			15.91			5.90			0.00			0.00	
10/26/2016	404.00		10.92			13.95			5.85			0.00			0.00	
11/22/2016	413.60		12.01			14.80			6.17			0.00			0.00	
12/20/2016	441.10		29.72			25.63			6.15			0.00			0.00	

Note:
Elevations are in feet relative to NAVD88 datum.

**TABLE 4
SAN JOAQUIN DAM
SEEPAGE WEIR MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017**

Seepage Weir ----->		East Drain			West Drain			Filter Drain			U/S Collector Drain #1			U/S Collector Drain #2		
Date	Reservoir Elevation (feet)	read. (ft)	flow (gpm)	comment	read. (ft)	flow (gpm)	comment	read. (ft)	flow (gpm)	comment	read. (ft)	flow (gpm)	comment	read. (ft)	flow (gpm)	comment
1/26/2017	471.60		58.70			51.40			6.50			0.00			0.00	
2/24/2017	472.05		57.36			60.38			7.41			0.00			0.00	
2/25/2017	472.00															
2/26/2017	472.00															
2/27/2017	472.00		56.90			60.40			7.34			0.00			0.00	
2/28/2017	471.90		56.32			60.15			7.14			0.00			0.00	
3/1/2017	471.90		55.80			59.70			7.02			0.00			0.00	
3/2/2017	471.90		56.34			59.71			7.04			0.00			0.00	
3/29/2017	467.90		51.95			56.32			7.34			0.00			0.00	
4/27/2017	457.60		44.35			47.55			7.65			0.00			0.02	
5/23/2017	453.50		38.22			41.80			7.76			0.00			0.00	
6/21/2017	447.40		34.25			39.20			7.61			0.00			0.00	
7/26/2017	435.10		29.68			32.46			7.54			0.00			0.00	
8/25/2017	420.10		22.90			24.30			7.70			0.00			0.00	
9/27/2017	407.10		16.00			18.94			7.44			0.00			0.00	
10/26/2017	395.00		10.73			14.80			7.19			0.00			0.00	
11/28/2017	409.00		13.48			16.68			7.45			0.00			0.00	
12/20/2017	416.80		15.28			18.42			7.17			0.00			0.00	

Note:
Elevations are in feet relative to NAVD88 datum.

TABLE 4
SAN JOAQUIN DAM
SEEPAGE WEIR MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017

Seepage Weir ----->		D/S Toe Drain			Floor Drain			Right Groin Drain		
Date	Reservoir Elevation (feet)	read.	flow (gpm)	comment	read.	flow (gpm)	comment	read.	flow (gpm)	comment
1/3/2008	443.20		2.20			10.50				
1/29/2008	452.20		1.96			7.92				
2/27/2008	460.80		1.86			14.00				
3/26/2008	468.00		1.86			10.56				
4/29/2008	468.60		1.88			10.74				
5/29/2008	464.70		2.16			8.11				
6/26/2008	455.70		2.50			8.80				
7/29/2008	447.30		2.30			8.10			7.90	
8/28/2008	438.80		2.11			8.33			0.11	
9/26/2008	430.70		1.56			16.00			0.39	
10/29/2008	412.50		1.98			3.75			0.40	
11/25/2008	404.70		2.00			8.80			0.00	
12/30/2008	440.90		2.00			10.56			0.00	
1/28/2009	463.70		2.00			10.60			0.00	
2/25/2009	470.10		2.12			9.46			0.00	
3/26/2009	469.40		2.19			9.30			0.05	
4/29/2009	466.90		1.98			9.84			0.23	
5/18/2009	466.70		1.00			10.00			0.13	
5/29/2009	465.00								0.16	
6/30/2009	460.20		1.90			10.30			0.10	
7/30/2009	451.10		1.93			10.56			0.00	
8/25/2009	440.10		2.09			7.90			0.00	
9/30/2009	432.20		1.52			16.00			0.13	
10/29/2009	431.40								0.14	
12/1/2009	427.40								0.00	
12/29/2009	448.10								0.17	
1/27/2010	465.60		2.43			9.34			0.62	
2/25/2010	470.20		2.94			10.56			0.61	
3/29/2010	465.70		2.40			16.00			0.00	
4/4/2010	465.00		1.00			16.00				
4/27/2010	468.40		2.40			10.56			0.00	
5/27/2010	463.30		2.50			10.00			1.50	
6/30/2010	454.70		2.11			9.18			1.10	
7/28/2010	445.60		2.40			10.56			0.99	
8/31/2010	437.10		2.08			9.51			1.07	
9/29/2010	422.70		2.11			6.34			0.72	
10/27/2010	426.40		2.20			7.80			0.11	
11/29/2010	439.80		2.26			7.92			0.27	
12/30/2010	456.60		4.00			16.00			2.00	

Note:
Elevations are in feet relative to NAVD88 datum.

TABLE 4
SAN JOAQUIN DAM
SEEPAGE WEIR MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017

Seepage Weir ----->		D/S Toe Drain			Floor Drain			Right Groin Drain		
Date	Reservoir Elevation (feet)	read.	flow (gpm)	comment	read.	flow (gpm)	comment	read.	flow (gpm)	comment
2/1/2011	468.90		4.00			8.00			2.30	
2/23/2011	469.00		3.51			7.92			0.95	
3/29/2011	470.30		3.17			7.90			0.38	
4/27/2011	464.80		2.60			5.20			0.71	
5/26/2011	457.30		2.70			9.50			0.00	
6/28/2011	443.50		2.50			8.90			0.00	
7/29/2011	425.10		2.43			6.34			0.00	
8/24/2011	418.00		2.43			7.92			0.25	
9/27/2011	400.90		2.26			7.92			0.20	
10/26/2011	402.20		2.26			7.05			0.27	
11/30/2011	425.10		2.56			7.93			0.31	
12/21/2011	435.70		2.26			7.93			0.29	
1/24/2012	441.40		2.38			7.92			0.36	
2/28/2012	448.40		2.11			6.34			0.34	
3/26/2012	452.70		2.29			7.79			0.35	
4/23/2012	463.40		2.43			7.92			0.31	
5/30/2012	457.30		2.11			6.34			0.26	
6/13/2012	452.90		2.26			7.92			0.31	
6/26/2012	450.20		1.58			10.56			0.21	
7/24/2012	439.80		1.58			10.56			0.21	
8/8/2012	437.60		1.58			10.56			0.15	
8/22/2012	433.40		1.98			7.92			0.24	
8/29/2012	431.30		1.58			10.56			0.13	
9/25/2012	420.80		2.56			7.93			0.10	
10/31/2012	412.30		2.11			6.34			0.14	
11/27/2012	420.80		2.11			7.92			0.16	
12/18/2012	448.00		2.28			7.37			0.19	
1/29/2013	468.60		2.11			7.90			0.26	
2/28/2013	469.20		2.11			7.92			0.24	
3/27/2013	468.30		2.26			7.92			0.25	
4/25/2013	462.70		2.16			7.92			0.25	
5/21/2013	454.20		2.26			7.92			0.26	
6/25/2013	439.30		2.34			7.51			0.21	
7/23/2013	431.50		2.12			7.04			0.19	

Note:
Elevations are in feet relative to NAVD88 datum.

**TABLE 4
SAN JOAQUIN DAM
SEEPAGE WEIR MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017**

Seepage Weir ----->		D/S Toe Drain			Floor Drain			Right Groin Drain		
Date	Reservoir Elevation (feet)	read.	flow (gpm)	comment	read.	flow (gpm)	comment	read.	flow (gpm)	comment
8/21/2013	418.00		2.11			6.34			0.17	
9/24/2013	404.00		1.98			6.34			0.16	
10/29/2013	400.60		2.13			6.89			0.19	
11/26/2013	407.90		2.16			6.34			0.20	
12/19/2013	425.80		2.26			5.28			0.22	
1/28/2014	439.70		2.11			7.90			0.16	
2/25/2014	449.70		2.17			7.20			0.19	
3/26/2014	465.10		1.66			7.92			0.52	
3/28/2014	465.70		2.09			6.44			0.18	
4/29/2014	465.30		2.16			7.51			0.21	
5/28/2014	450.60		1.90			7.08			0.21	
6/25/2014	440.10		2.26			6.34			0.17	
7/29/2014	431.20		2.03			6.49			0.15	
8/26/2014	419.50		1.98			10.56			0.16	
9/23/2014	405.30		2.11			6.30			0.13	
10/29/2014	400.90		2.07			6.15			0.14	
11/25/2014	410.90		1.90			6.34			0.14	
12/30/2014	430.60		1.80			6.34			0.23	
1/27/2015	466.70		2.26			7.04			0.96	
2/25/2015	468.90		2.11			6.30			0.15	
3/26/2015	465.90		2.12			7.20			0.24	
4/28/2015	465.70		2.29			5.70			0.15	
5/28/2015	466.40		1.90			5.34			0.14	
6/30/2015	454.50		1.50			4.30			0.52	
7/28/2015	445.60		1.90			6.30			0.19	
8/28/2015	437.60		2.10			6.30			0.15	
9/24/2015	426.90		2.10			6.34			0.19	
10/27/2015	415.40		2.00			6.30			0.16	
11/19/2015	412.90		2.21			6.56			0.17	
12/22/2015	425.50		2.53			5.86			0.19	
1/27/2016	463.60		2.43			6.34			0.25	
2/25/2016	468.90		2.53			7.33			0.22	
3/30/2016	468.00		2.29			5.38			0.23	
4/28/2016	461.30		2.10			7.30			0.23	
5/25/2016	451.30		1.90			5.60			0.20	
6/28/2016	414.10		1.70			6.00			0.15	
7/27/2016	434.20		1.90			6.30			0.13	
8/23/2016	418.60		2.06			6.40			0.09	
9/27/2016	406.40		1.53			4.61			0.10	
10/26/2016	404.00		2.21			6.34			0.17	
11/22/2016	413.60		2.17			5.77			0.15	
12/20/2016	441.10		2.23			6.16			0.15	

Note:
Elevations are in feet relative to NAVD88 datum.

TABLE 4
SAN JOAQUIN DAM
SEEPAGE WEIR MEASUREMENTS
JANUARY 2008 THROUGH DECEMBER 2017

Seepage Weir ----->		D/S Toe Drain			Floor Drain			Right Groin Drain		
Date	Reservoir Elevation (feet)	read.	flow (gpm)	comment	read.	flow (gpm)	comment	read.	flow (gpm)	comment
1/26/2017	471.60		3.50			6.30			0.15	
2/24/2017	472.05		3.15			6.30			0.15	
2/25/2017	472.00									
2/26/2017	472.00									
2/27/2017	472.00		3.17			6.30			0.15	
2/28/2017	471.90		3.15			6.40			0.16	
3/1/2017	471.90		3.17			6.30			0.16	
3/2/2017	471.90		3.36			7.90			0.15	
3/29/2017	467.90		3.18			6.70			0.15	
4/27/2017	457.60		2.50			6.30			0.39	
5/23/2017	453.50		2.50			6.30			0.41	
6/21/2017	447.40		2.50			5.60			0.20	
7/26/2017	435.10		2.50			6.30			0.25	
8/25/2017	420.10		2.50			5.20			0.24	
9/27/2017	407.10		2.50			5.20			0.19	
10/26/2017	395.00		2.50			5.80			0.22	
11/28/2017	409.00		2.50			4.20			0.39	
12/20/2017	416.80		2.50			4.51			0.17	

Note:
Elevations are in feet relative to NAVD88 datum.

TABLE 5
SAN JOAQUIN DAM
SEDIMENT COLLECTION
APRIL 2014 THROUGH NOVEMBER 2016

Date	Reservoir Elevation (feet)	West Drain				East Drain				Filter Drain			
		Silt Depth (in.)	Silt Volume (lbs)	Flow (gpm)	Comments	Silt Depth (in.)	Silt Volume (lbs)	Flow (gpm)	Comments	Silt Depth (in.)	Silt Volume (lbs)	Flow (gpm)	Comments
4/30/2014	465.3	1.5	6.47	57	CK/MD	0.0	0.0	50.0		0.0	0.0	9.0	
5/28/2014	450.6	0.5	1.85	46.03	BW/MC	0.0	0.0	34.1		0.0	0.0	8.2	
7/17/2014	436.4	1.6	5.14	36.19	10 day hold 7/1/14 to 7/11/14 @ 438' CK/MC	0.0	0.0	27.4		0.0	0.0	7.9	
7/29/2014	431.2	0.5	2.69	33.88	SH/MD	0.0	0.0	25.0		0.0	0.0	8.2	
8/28/2014	419.5	0.1	3.54	27.02	CK/MD	0.0	0.0	19.1		0.0	0.0	8.0	
9/23/2014	405.3	0.3	3.14	21.32	BW/MD	0.0	0.0	13.0		0.0	0.0	8.0	
10/30/2014	400.9	0.1	3.21	18.5	West Drain Has a lot of Foam. TC/SH	0.0	0.0	10.1		0.0	0.0	7.9	
11/25/2014	410.9	0.1	3.88	18.6	CK/TC	0.0	0.0	10.8		0.0	0.0	7.0	
12/30/2014	430.6	0.3	3.61	26.64	SH	0.0	0.0	23.3		0.0	0.0	7.5	
1/27/2015	466.7	0.5	8.71	60.49	SH/MC	0.0	0.0	61.5		0.0	0.0	8.2	
3/5/2015	470.1	0.3	4.30	64.1	MD/CK	0.0	0.0	64.2		0.0	0.0	8.0	
3/26/2015	465.9	0.1	2.73	63.4	SH/MC	0.0	0.0	62.1		0.0	0.0	9.0	
4/28/2015	465.7	0.1	2.41	59.6	MD/MC	0.0	0.0	60.1		0.0	0.0	9.9	
5/28/2015	466.4	0.1	2.33	49.61	SH/CK	0.0	0.0	54.0		0.0	0.0	7.4	
6/30/2015	454.5	0.3	2.47	43.46	MD/TC	0.0	0.0	44.8		0.0	0.0	8.3	
7/28/2015	445.6	0.1	2.08	35.9	MC/BW	0.0	0.0	35.4		0.0	0.0	6.7	
8/28/2015	473.6	0.3	2.13	30.4	CK/MC	0.0	0.0	29.2		0.0	0.0	7.1	
9/24/2015	426.9	0.1	2.04	25.1	MC/JG	0.0	0.0	23.5		0.0	0.0	7.10	
10/27/2015	415.4	0.3	2.11	18.7	JG/CK	0.0	0.0	16.9		0.0	0.0	6.90	
11/19/2015	412.9	0.1	2.02	16.38	JG/MD	0.0	0.0	14.2		0.0	0.0	6.4	
12/22/2015	425.5	0.1	2.04	19.4	CK/MD	0.0	0.0	19.5		0.0	0.0	6.7	
1/27/2016	463.6	0.3	2.47	42.08	SH	0.0	0.0	53.2		0.0	0.0	6.5	
2/25/2016	468.9	0.5	3.72	50.05	MD	0.0	0.0	53.4		0.0	0.0	6.6	
3/30/2016	468.0	0.3	2.61	50.9	CC	0.0	0.0	56.4		0.0	0.0	6.2	
4/28/2016	461.3	0.3	2.43	46.75	SH	0.0	0.0	50.8		0.0	0.0	6.7	
5/25/2016	451.3	0.1	2.09	40.29	MD	0.0	0.0	43.1		0.0	0.0	7.2	
6/28/2016	414.1	0.1	2.11	34.83	AW	0.0	0.0	35.0		0.0	0.0	6.7	
7/27/2016	434.2	0.1	2.27	29.3	CK	0.0	0.0	28.2		0.0	0.0	6.6	10 day hold 7/11-7/21/16
8/23/2016	418.6	0.1	2.04	20.95	JM	0.0	0.0	19.0		0.0	0.0	6.5	5 day hold 8/23-8/28/16
9/27/2016	406.4	0.1	2.06	15.91	JM	0.0	0.0	13.0		0.0	0.0	5.7	10 day hold 9/30-
10/26/2016	404.0	0.3	2.07	13.95	MC	0.0	0.0	10.9		0.0	0.0	5.9	
11/22/2016	413.6	0.3	2.13	14.8	SH	0.0	0.0	12.0		0.0	0.0	6.2	

Note:
Elevations are in feet relative to NAVD88 datum.

**TABLE 6
SAN JOAQUIN DAM
HORIZONTAL AND VERTICAL MOVEMENT SURVEY DATA
2004 THROUGH 2016**

Date	Reservoir Elevation (feet)	Horizontal Movement Since Initial Survey (Feet)																	
		Positive = North (Downstream); Negative = South (Upstream)																	
		SA-1	SA-2	SA-3	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6	SB-7	SC-1	SC-2	SC-3	SC-4	SC-5	SC-6	SC-7	SC-8
12/20/2004	370.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9/27/2005	422.80	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10/26/2005	411.70	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11/4/2005	411.70	-0.020	0.000	-0.030	-0.005	0.005	0.020	0.020	0.015	0.000	0.005	-0.035	-0.045	-0.050	-0.070	-0.085	-0.105	-0.125	-0.120
6/1/2006	467.10	-0.020	0.000	-0.040	-0.005	0.010	0.030	0.030	0.025	0.000	0.010	-0.035	-0.045	-0.045	-0.070	-0.085	-0.105	-0.125	-0.120
5/25/2007	461.40	-0.020	0.000	-0.035	-0.005	0.010	0.025	0.025	0.020	-0.005	0.010								
6/9/2008	460.00	-0.020	0.000	-0.025	0.005	0.020	0.030	0.030	0.025	0.000	0.020	-0.045	-0.040	-0.045	-0.070	-0.090	-0.110	-0.120	-0.120
6/10/2009	460.00	-0.035	-0.005	-0.035	-0.005	0.010	0.025	0.025	0.020	0.000	0.015	-0.065	-0.060	-0.055	-0.080	-0.095	-0.110	-0.130	-0.125
5/27/2010	463.30	-0.035	-0.005	-0.040	-0.005	0.005	0.025	0.025	0.020	0.000	0.015	-0.065	-0.050	-0.050	-0.080	-0.095	-0.105	-0.130	-0.125
5/26/2011	457.20	-0.040	-0.005	-0.040	-0.005	0.005	0.020	0.025	0.025	0.000	0.015	-0.065	-0.050	-0.050	-0.075	-0.095	-0.105	-0.130	-0.130
5/24/2012	457.20	-0.030	-0.005	-0.035	0.000	0.010	0.020	0.020	0.020	-0.005	0.010	-0.065	-0.050	-0.050	-0.080	-0.105	-0.110	-0.135	-0.135
6/20/2013	441.40	-0.035	-0.010	-0.040	-0.010	0.005	0.015	0.020	0.015	-0.005	0.015	-0.060	-0.055	-0.055	-0.080	-0.105	-0.115	-0.135	-0.135
5/2/2014	465.10	-0.040	-0.015	-0.040	-0.015	0.005	0.015	0.020	0.020	-0.005	0.010	-0.050	-0.050	-0.050	-0.080	-0.090	-0.115	-0.135	-0.130
6/10/2015	463.20	-0.035	-0.010	-0.035	-0.015	0.010	0.015	0.020	0.020	-0.005	0.010	-0.060	-0.055	-0.045	-0.075	-0.095	-0.115	-0.130	-0.130
8/1/2016	430.80	-0.030	-0.005	-0.035	-0.015	0.010	0.020	0.020	0.025	0.000	0.020	-0.065	-0.055	-0.050	-0.075	-0.095	-0.115	-0.125	-0.125

Note:
Elevations are in feet relative to NAVD88 datum.

**TABLE 6
SAN JOAQUIN DAM
HORIZONTAL AND VERTICAL MOVEMENT SURVEY DATA
2004 THROUGH 2016**

Date	Reservoir Elevation (feet)	Horizontal Movement Since Initial Survey (Feet)												
		Positive = North (Downstream); Negative = South (Upstream)												
		SD-1	SD-2	SD-3	SD-4	SD-5	SD-6	SD-7	SE-2	SE-3	SE-5	SE-6	SE-7	
12/20/2004	370.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
9/27/2005	422.80	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
10/26/2005	411.70	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
11/4/2005	411.70	0.000	0.000	0.000	0.065	0.045	-0.010	-0.005	0.025	0.040	0.055	0.025	-25.340	
6/1/2006	467.10	-0.005	0.000	0.000	0.075	0.045	-0.015	-0.005						
5/25/2007	461.40													
6/9/2008	460.00	-0.005	0.000	0.000	0.080	0.045	-0.015	0.000	Note: The SE Survey Monument Points are located inside the reservoir and cannot be surveyed while the Water Surface Elevation is above 422 feet.					
6/10/2009	460.00	-0.010	0.000	0.000	0.085	0.040	-0.015	-0.005						
5/27/2010	463.30	-0.010	0.000	0.000	0.080	0.045	-0.020	-0.005						
5/26/2011	457.20	-0.010	0.005	0.010	0.090	0.055	-0.015	-0.005						
5/24/2012	457.20	-0.010	0.005	0.010	0.090	0.055	-0.015	-0.005						
6/20/2013	441.40	-0.010	0.015	0.015	0.095	0.060	-0.010	0.005						
5/2/2014	465.10	-0.015	0.000	0.005	0.080	0.040	-0.015	-0.005						
6/10/2015	463.20	-0.005	0.010	0.015	0.090	0.055	-0.010	0.005						
8/1/2016	430.80	-0.010	0.010	0.015	0.085	0.055	-0.010	0.005						

Note:
Elevations are in feet relative to NAVD88 datum.

**TABLE 6
SAN JOAQUIN DAM
HORIZONTAL AND VERTICAL MOVEMENT SURVEY DATA
2004 THROUGH 2016**

Date	Reservoir Elevation (feet)	Vertical Movement Since Initial Reading (Feet)																	
		Positive = Upward (Uplift); Negative = Downward (Settlement)																	
		SA-1	SA-2	SA-3	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6	SB-7	SC-1	SC-2	SC-3	SC-4	SC-5	SC-6	SC-7	SC-8
12/20/2004	370.00	300.242	300.137	300.170	360.119	360.627	360.443	360.504	360.256	360.177	360.926	420.056	419.748	419.955	419.516	419.467	419.526	419.768	420.402
9/27/2005	422.80	302.379	302.263	302.294	362.253	362.760	362.573	362.631	362.393	362.291	363.060	422.200	421.876	422.082	421.643	421.593	421.655	421.897	422.525
10/26/2005	411.70																		
11/4/2005	411.70																		
6/1/2006	467.10	302.374	302.264	302.294	362.264	362.769	362.584	362.639	362.404	362.299	363.069	422.225	421.900	422.105	421.665	421.615	421.675	421.915	422.540
5/25/2007	461.40	302.362	302.258	302.291	362.244	362.751	362.564	362.619	362.383	362.283	363.054	422.197	421.875	422.081	421.641	421.592	421.654	421.895	422.524
6/9/2008	460.00	302.359	302.254	302.288	362.246	362.756	362.571	362.626	362.391	362.291	363.061	422.198	421.888	422.093	421.653	421.608	421.668	421.908	422.538
6/10/2009	460.00	302.353	302.246	302.281	362.254	362.764	362.574	362.629	362.394	362.294	363.064	422.194	421.884	422.089	421.649	421.599	421.664	421.909	422.539
5/27/2010	463.30	302.355	302.250	302.283	362.254	362.759	362.569	362.624	362.389	362.289	363.059	422.209	421.894	422.099	421.659	421.609	421.674	421.919	422.549
5/26/2011	457.20	302.351	302.248	302.280	362.259	362.764	362.574	362.629	362.394	362.294	363.064	422.209	421.889	422.094	421.654	421.604	421.669	421.914	422.544
5/24/2012	457.20	302.348	302.242	302.277	362.244	362.754	362.564	362.624	362.389	362.289	363.059	422.204	421.884	422.089	421.649	421.599	421.664	421.909	422.539
6/20/2013	441.40	302.345	302.238	302.275	362.254	362.764	362.579	362.634	362.399	362.299	363.069	422.189	421.884	422.089	421.649	421.599	421.664	421.914	422.534
5/2/2014	465.10	302.342	302.235	302.272	362.254	362.759	362.564	362.629	362.394	362.294	363.064	422.184	421.889	422.094	421.654	421.604	421.669	421.919	422.534
6/10/2015	463.20	302.343	302.237	302.274	362.249	362.754	362.564	362.624	362.389	362.289	363.059	422.169	421.884	422.089	421.649	421.599	421.664	421.909	422.524
8/1/2016	430.80	302.344	302.239	302.278	362.244	362.754	362.564	362.624	362.389	362.294	363.064	422.159	421.874	422.079	421.639	421.594	421.659	421.904	422.519

Note:
Elevations are in feet relative to NAVD88 datum.

**TABLE 6
SAN JOAQUIN DAM
HORIZONTAL AND VERTICAL MOVEMENT SURVEY DATA
2004 THROUGH 2016**

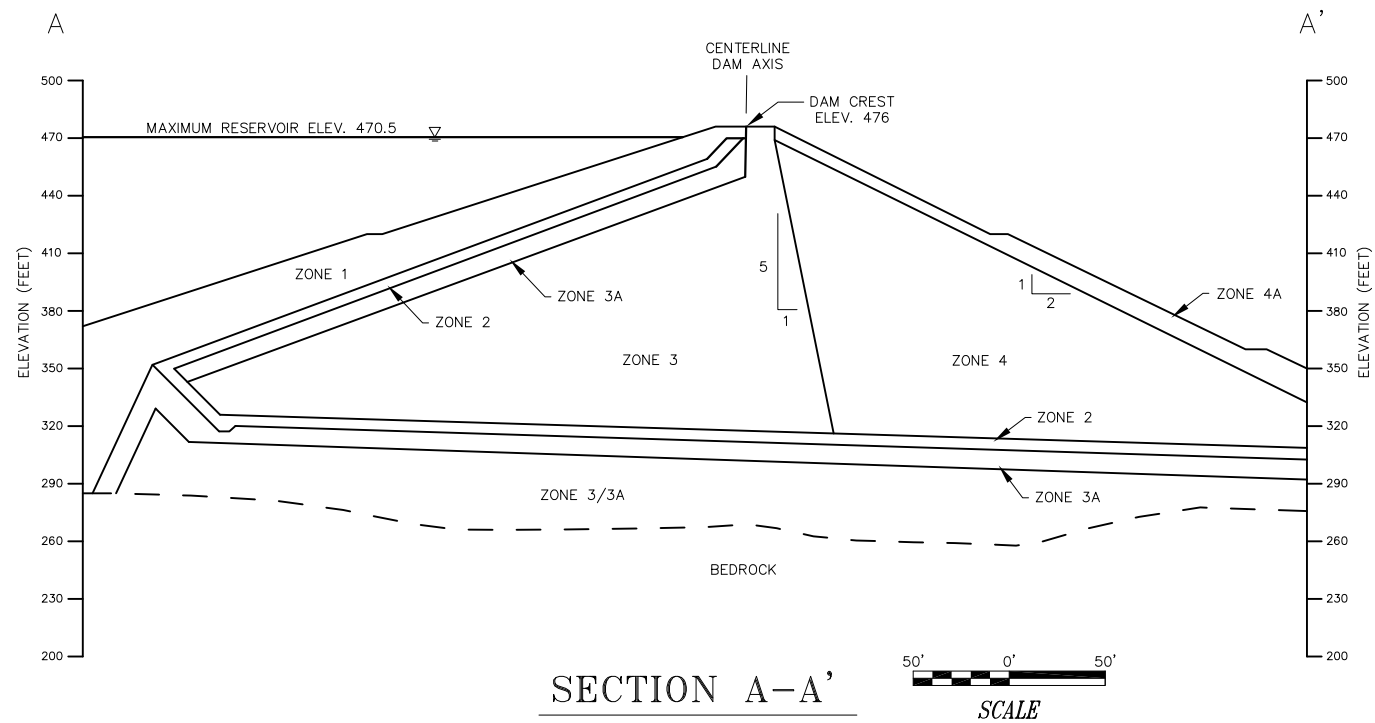
Date	Reservoir Elevation (feet)	Vertical Movement Since Initial Reading (Feet)												
		Positive = Upward (Uplift); Negative = Downward (Settlement)							SE-2	SE-3	SE-5	SE-6	SE-7	
		SD-1	SD-2	SD-3	SD-4	SD-5	SD-6	SD-7						
12/20/2004	370.00	476.015	476.636	477.565	478.427	477.546	476.917	476.307		420.061	419.949	420.021	420.319	420.670
9/27/2005	422.80	478.151	478.767	479.699	480.556	479.664	479.038	478.418		422.181	422.069	422.130	422.452	422.807
10/26/2005	411.70													
11/4/2005	411.70													
6/1/2006	467.10	478.158	478.773	479.698	480.553	479.663	479.033	478.408						
5/25/2007	461.40	478.144	478.758	479.688	480.540	479.650	479.023	478.405						
6/9/2008	460.00	478.156	478.771	479.701	480.556	479.661	479.036	478.421						
6/10/2009	460.00	478.164	478.779	479.709	480.564	479.674	479.049	478.434						
5/27/2010	463.30	478.174	478.784	479.714	480.569	479.679	479.054	478.439						
5/26/2011	457.20	478.174	478.784	479.714	480.569	479.679	479.054	478.439						
5/24/2012	457.20	478.164	478.774	479.699	480.554	479.664	479.039	478.424						
6/20/2013	441.40	478.164	478.774	479.704	480.554	479.659	479.034	478.424						
5/2/2014	465.10	478.159	478.774	479.699	480.549	479.654	479.034	478.429						
6/10/2015	463.20	478.164	478.774	479.699	480.549	479.654	479.034	478.429						
8/1/2016	430.80	478.169	478.779	479.704	480.554	479.659	479.039	478.429						

Note: The SE Survey Monument Points are located inside the reservoir and cannot be surveyed while the Water Surface Elevation is above 422 feet.

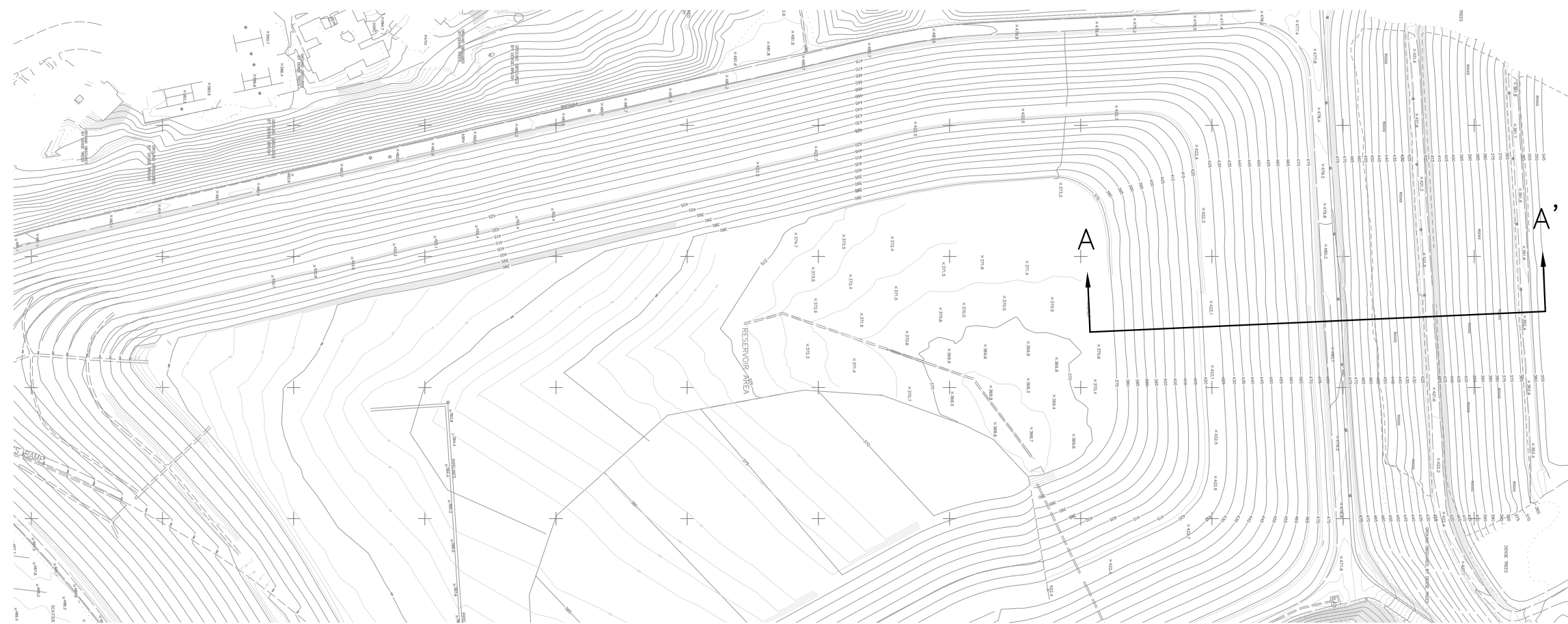
Note:
Elevations are in feet relative to NAVD88 datum.

**ANNUAL SURVEILLANCE REPORT
JANUARY 2017 THROUGH DECEMBER 2017
SAN JOAQUIN DAM, DSOD DAM NO. 1029-000**

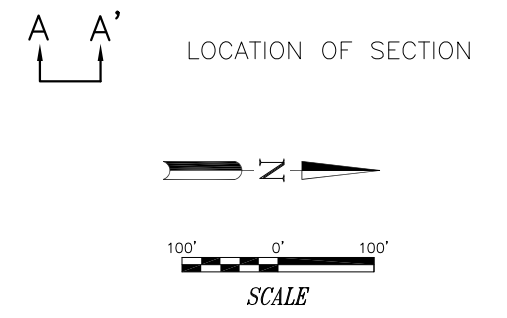
FIGURES



ZONE NO.	MATERIAL	FUNCTION
1	TERRACE SOIL	IMPERVIOUS BLANKET AND RESERVOIR LINING
2	IMPORTED SAND	FILTER DRAIN
3	IMPORTED GRAVEL	ROCK CORE (MAX SIZE 6")
3A	SANDSTONE	ROCK CORE TRANSITION (MAX SIZE 3")
4	SANDSTONE	DOWNSTREAM RANDOM SHELL (MAX SIZE 12")
4A	SANDSTONE	DOWNSTREAM SLOPE PROTECTION (MAX SIZE 30")



LEGEND



NOTES:



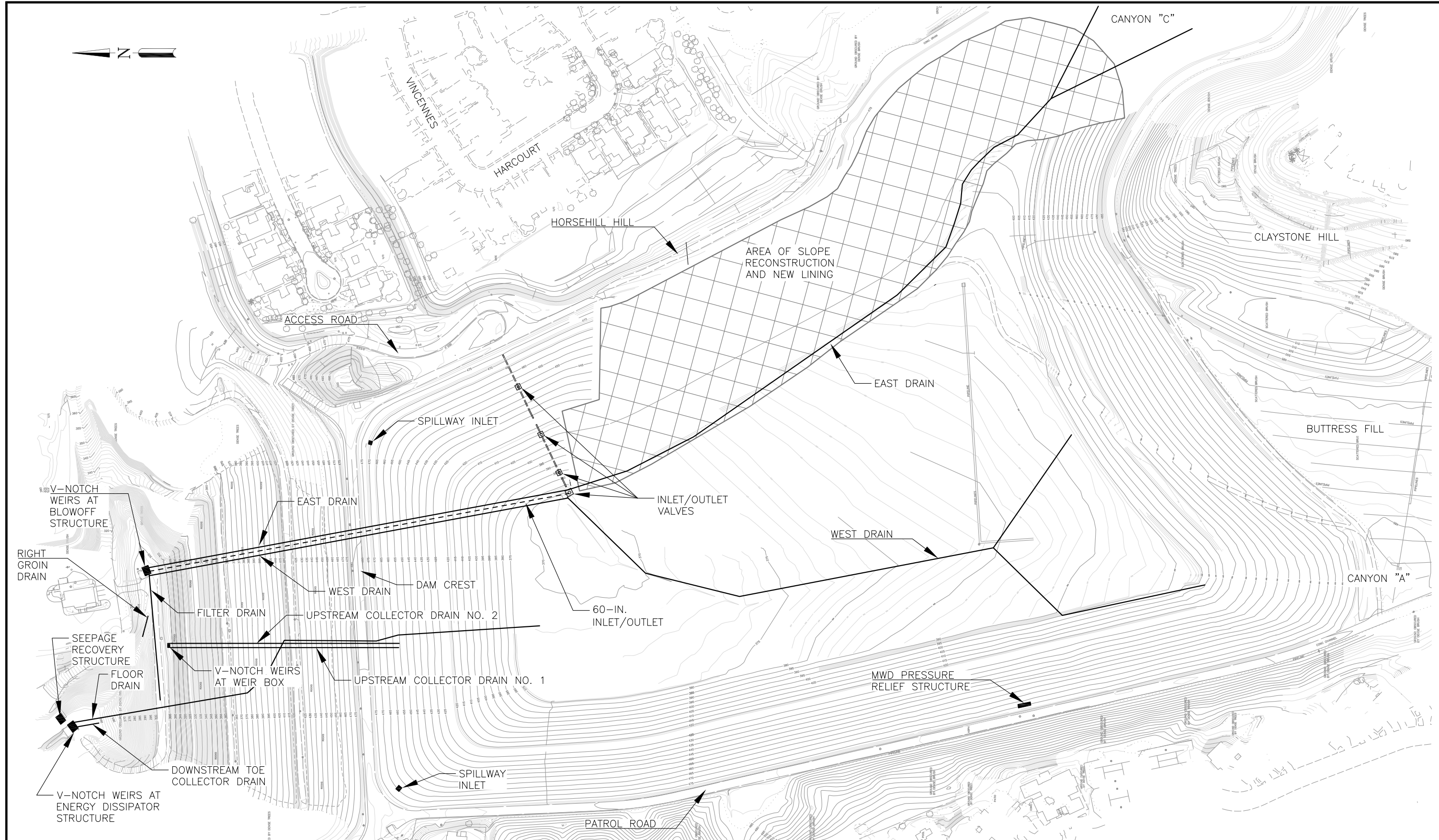
**SAN JOAQUIN
DAM AND RESERVOIR**

PLAN VIEW AND SECTION A-A'

**PROJECT NO.
397C-IRW**

**DATE
NOVEMBER 2018**

**FIGURE
1**



NOTES:
 1. NOT TO SCALE



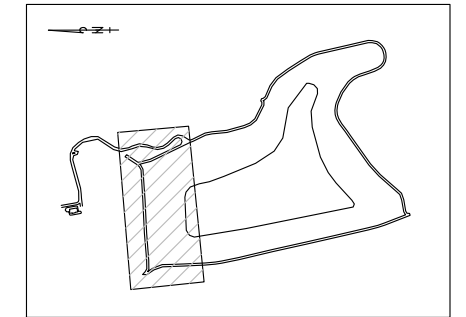
SAN JOAQUIN
 DAM AND RESERVOIR

DAM AND RESERVOIR SITE PLAN

PROJECT NO.
 397C-IRW

DATE
 NOVEMBER 2018

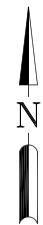
FIGURE
 2



KEY MAP
NTS

LEGEND

- 380 — 5-FOOT CONTOUR
- VB-2 VIBRATING WIRE PIEZOMETER
- ⊙ C-3 PNEUMATIC PIEZOMETER



NOTES:



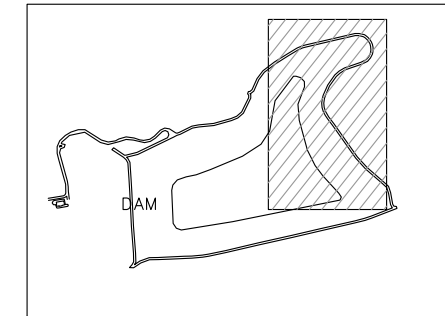
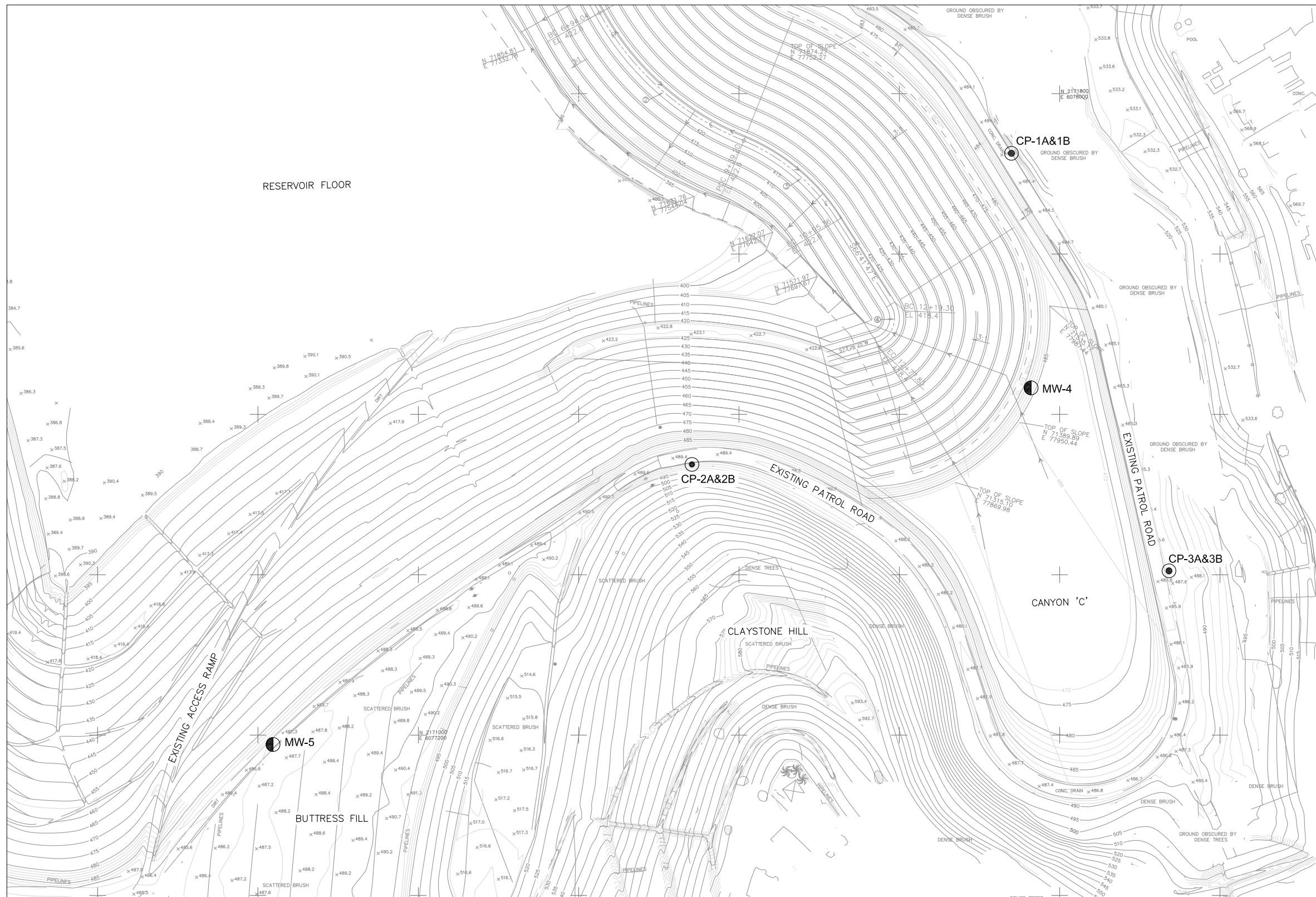
**SAN JOAQUIN
DAM AND RESERVOIR**

**DAM EMBANKMENT AND ABUTMENT
PIEZOMETER LOCATIONS**

**PROJECT NO.
397C-IRW**



**DATE
NOVEMBER 2018**

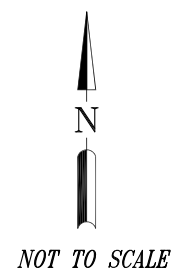
**FIGURE
3**



KEY MAP
NTS

LEGEND

- 
CP-1A&1B OPEN-WELL PIEZOMETER
- 
MW-4 MONITORING WELLS



NOTES:



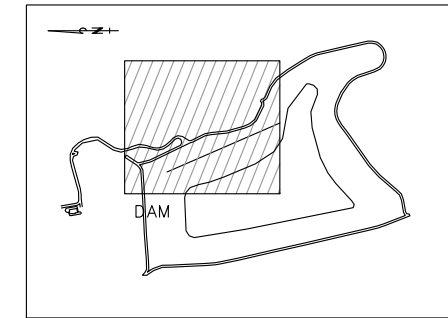
**SAN JOAQUIN
DAM AND RESERVOIR**

**LOCATIONS OF
OPEN-WELL PIEZOMETERS AND
MONITORING WELLS MW-4 AND MW-5**

**PROJECT NO.
397C-IRW**

**DATE
NOVEMBER 2018**

**FIGURE
4**



KEY MAP
NTS

LEGEND

- MW-1 ● MONITORING WELL



NOTES:



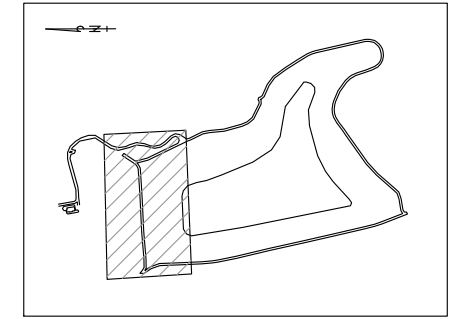
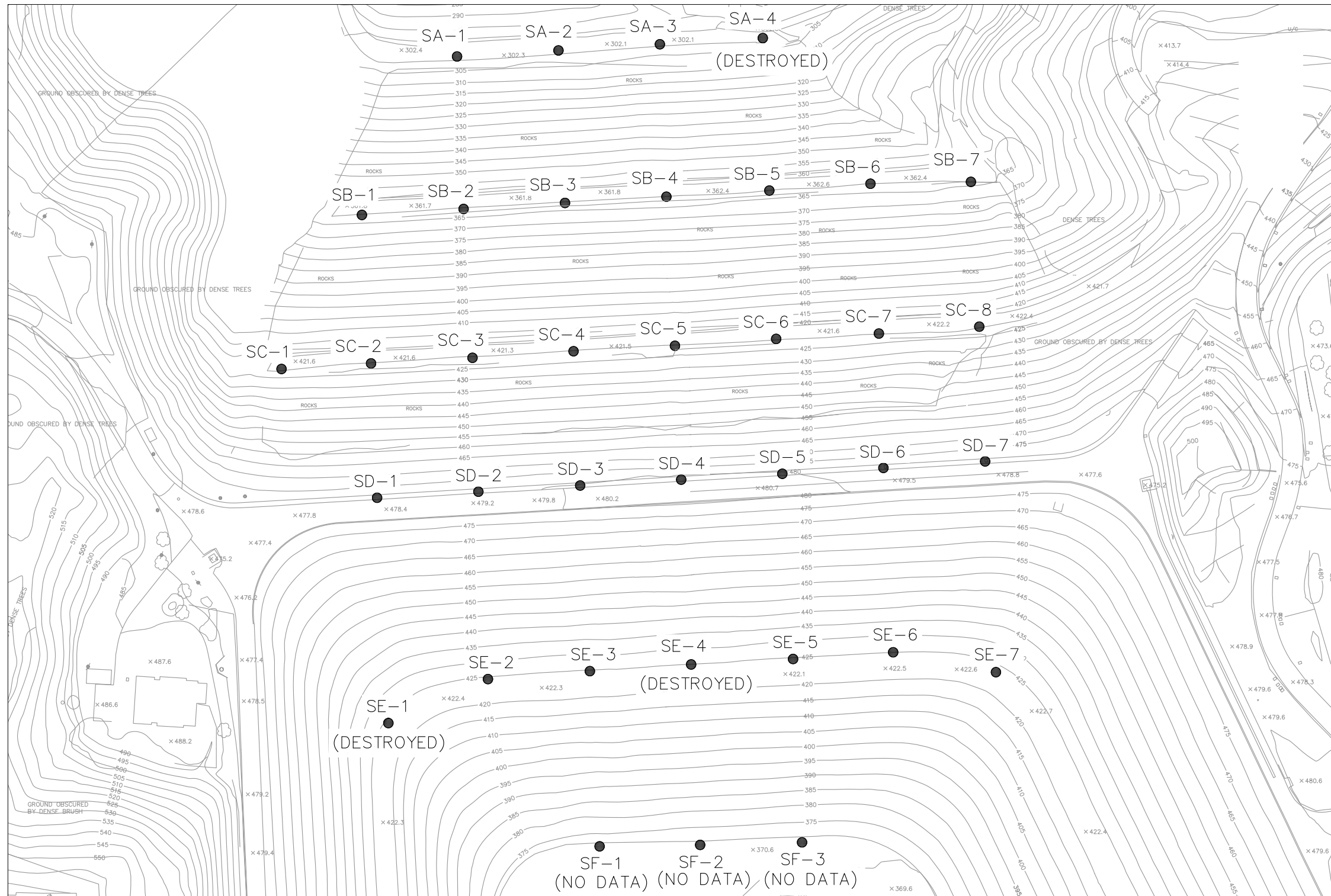
SAN JOAQUIN
DAM AND RESERVOIR

LOCATIONS OF MONITORING WELLS
MW-1, MW-2, MW-3,
MW-6, MW-7, AND MW-8

PROJECT NO.
397C-IRW

DATE
NOVEMBER 2018

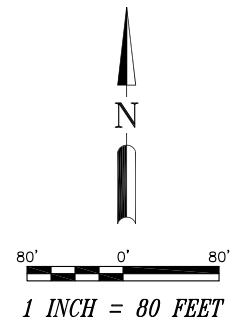
FIGURE
5



KEY MAP
NTS

LEGEND

SD-3 ● SURVEY MONUMENT



NOTES:



**SAN JOAQUIN
DAM AND RESERVOIR**

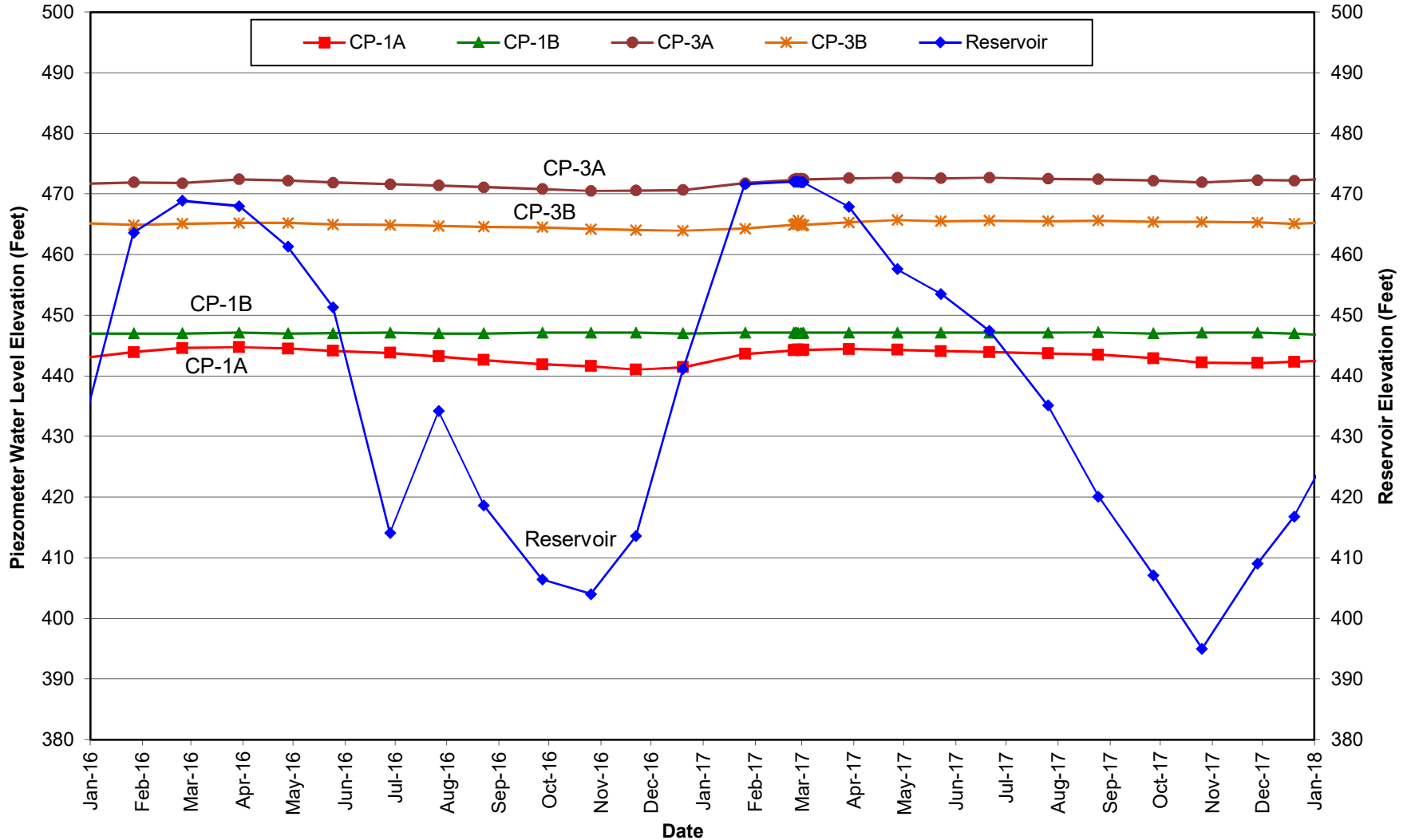
**LOCATIONS OF
SURVEY MONUMENT POINTS**

**PROJECT NO.
397C-IRW**

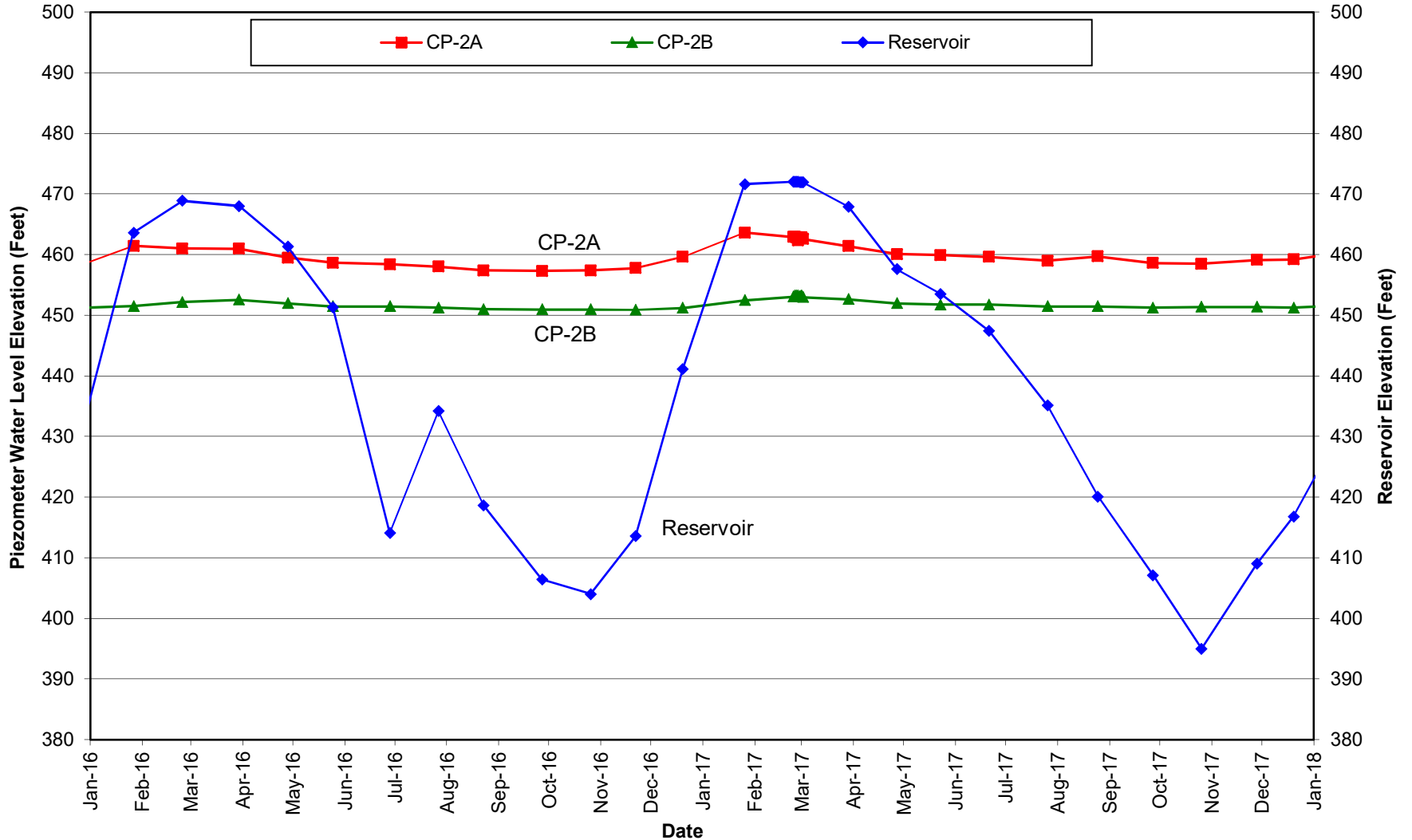
**DATE
NOVEMBER 2018**

**FIGURE
6**

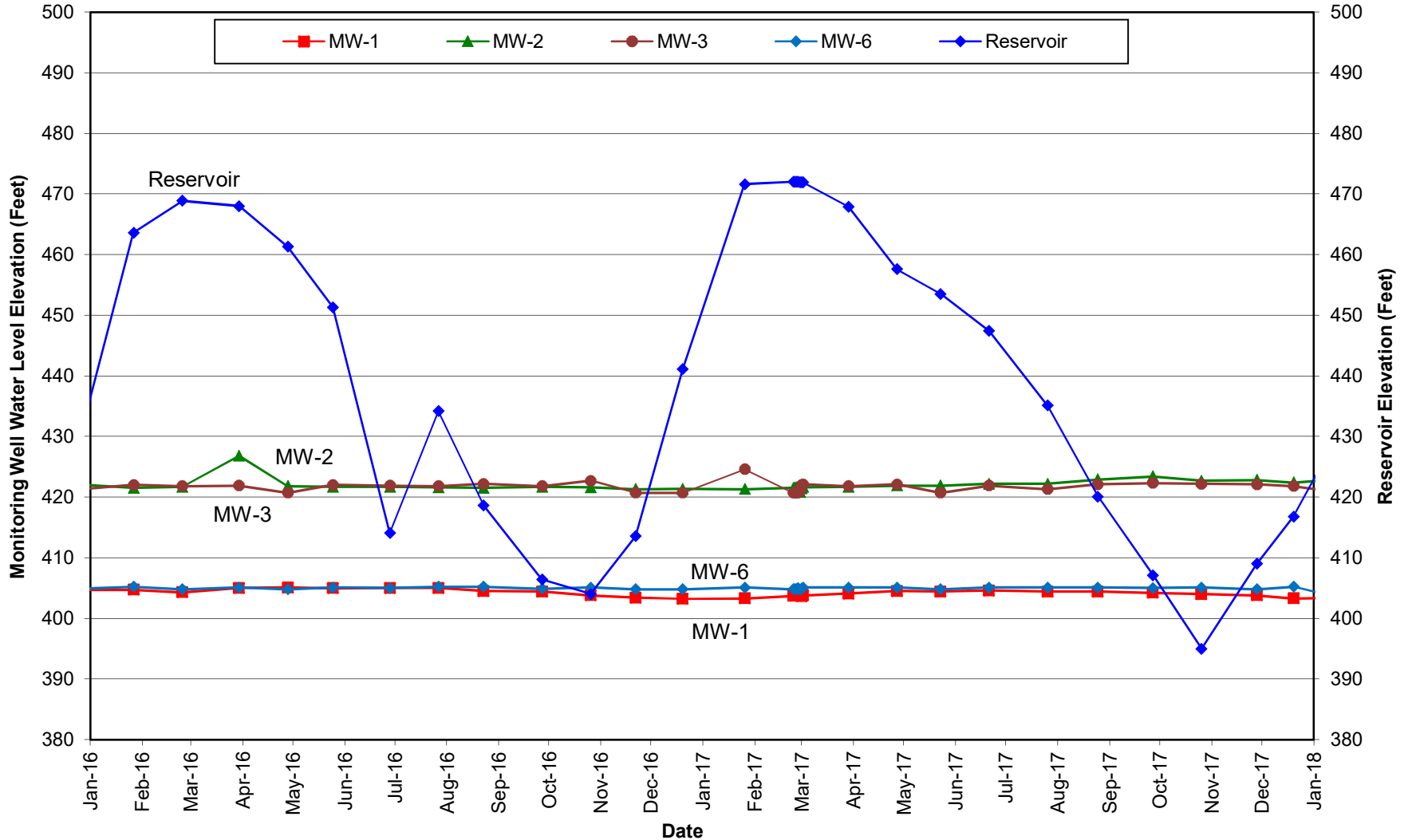
SAN JOAQUIN DAM 2-YR PIEZOMETER AND RESERVOIR WATER SURFACE ELEVATIONS PIEZOMETERS CP-1A, CP-1B, CP-3A, AND CP-3B JANUARY 2016 THROUGH DECEMBER 2017



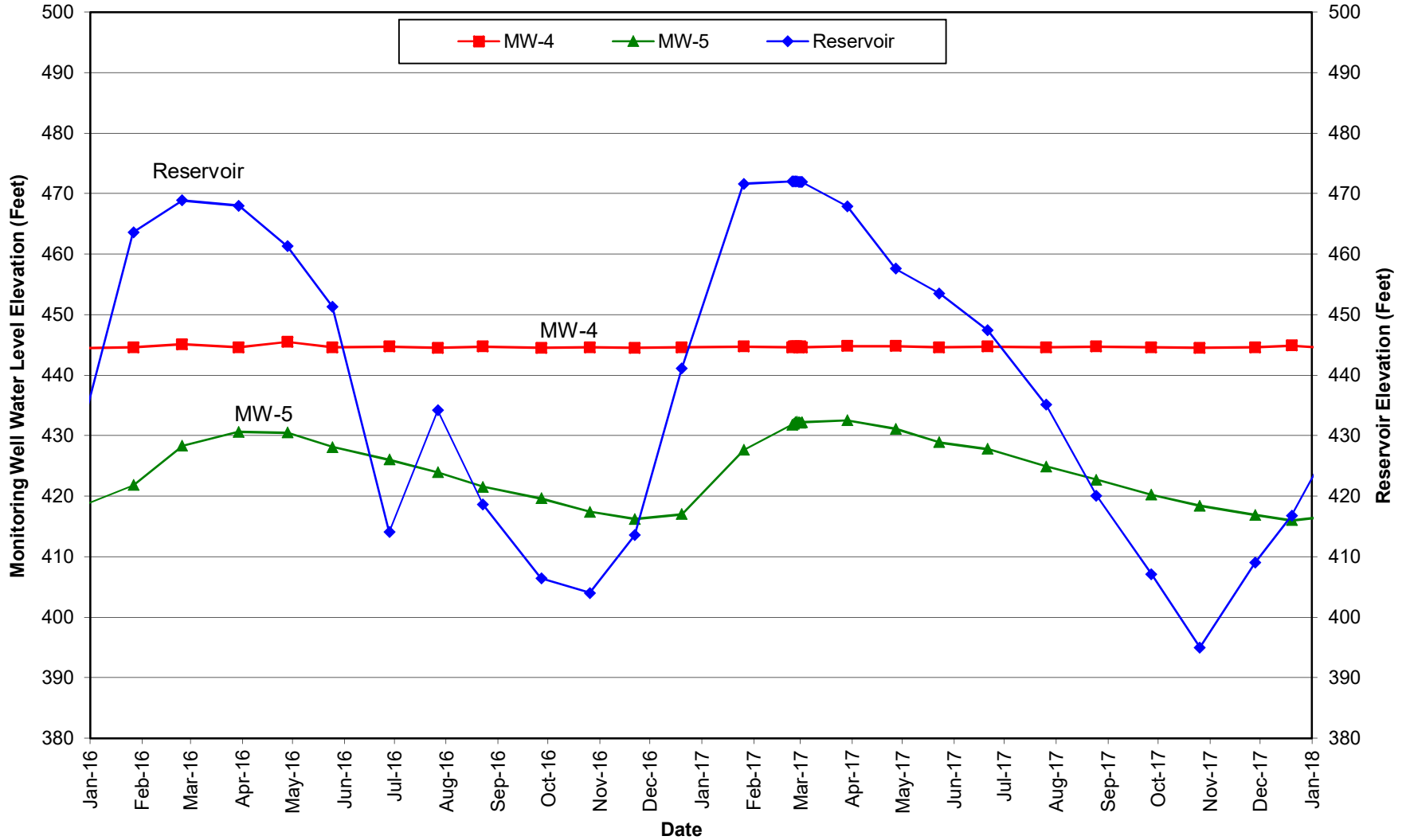
SAN JOAQUIN DAM 2-YR PIEZOMETER AND RESERVOIR WATER SURFACE ELEVATIONS PIEZOMETERS CP-2A AND CP-2B JANUARY 2016 THROUGH DECEMBER 2017



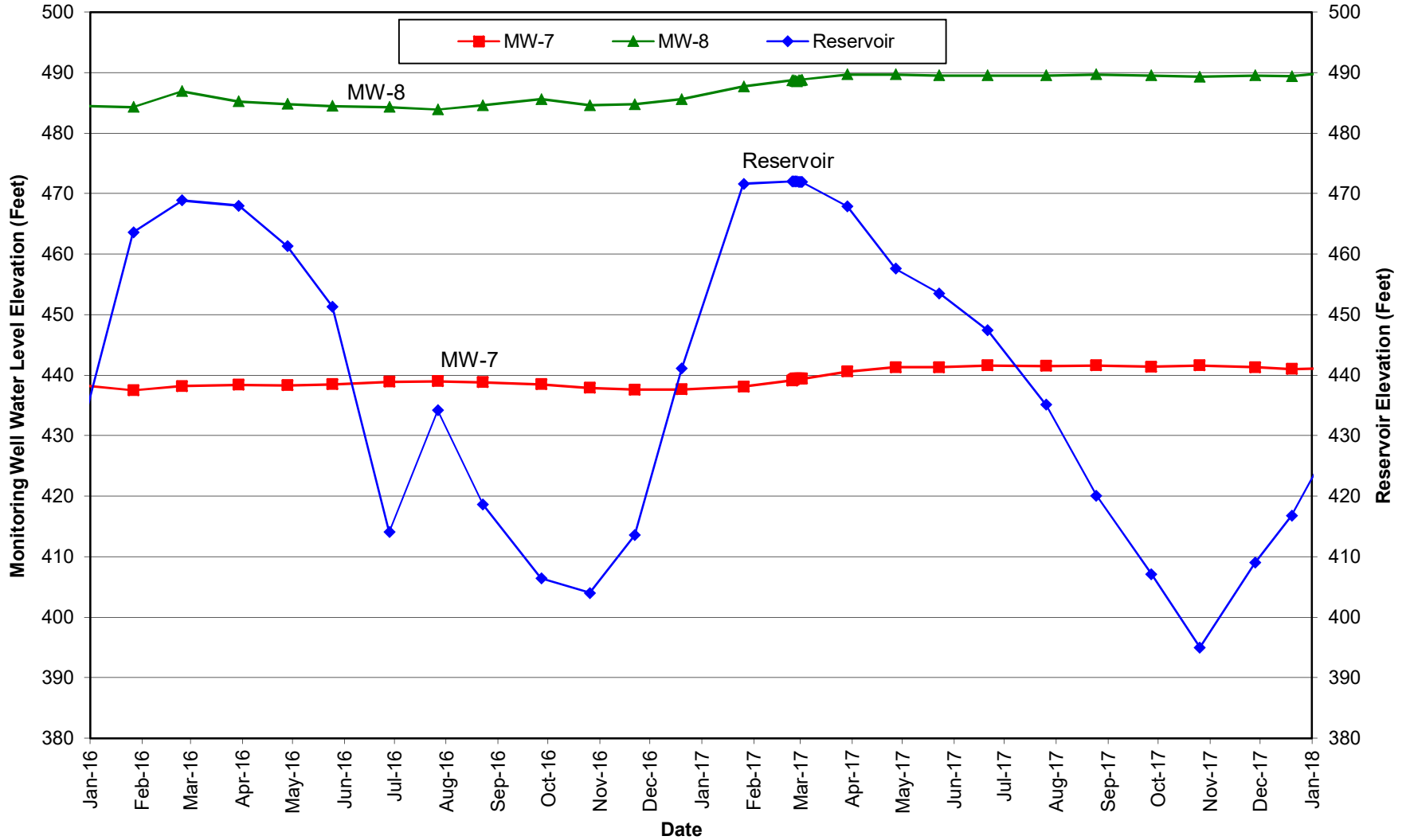
**SAN JOAQUIN DAM
2-YR MONITORING WELL AND RESERVOIR WATER SURFACE ELEVATIONS
MONITORING WELLS MW-1, MW-2, MW-3, AND MW-6
JANUARY 2016 THROUGH DECEMBER 2017**



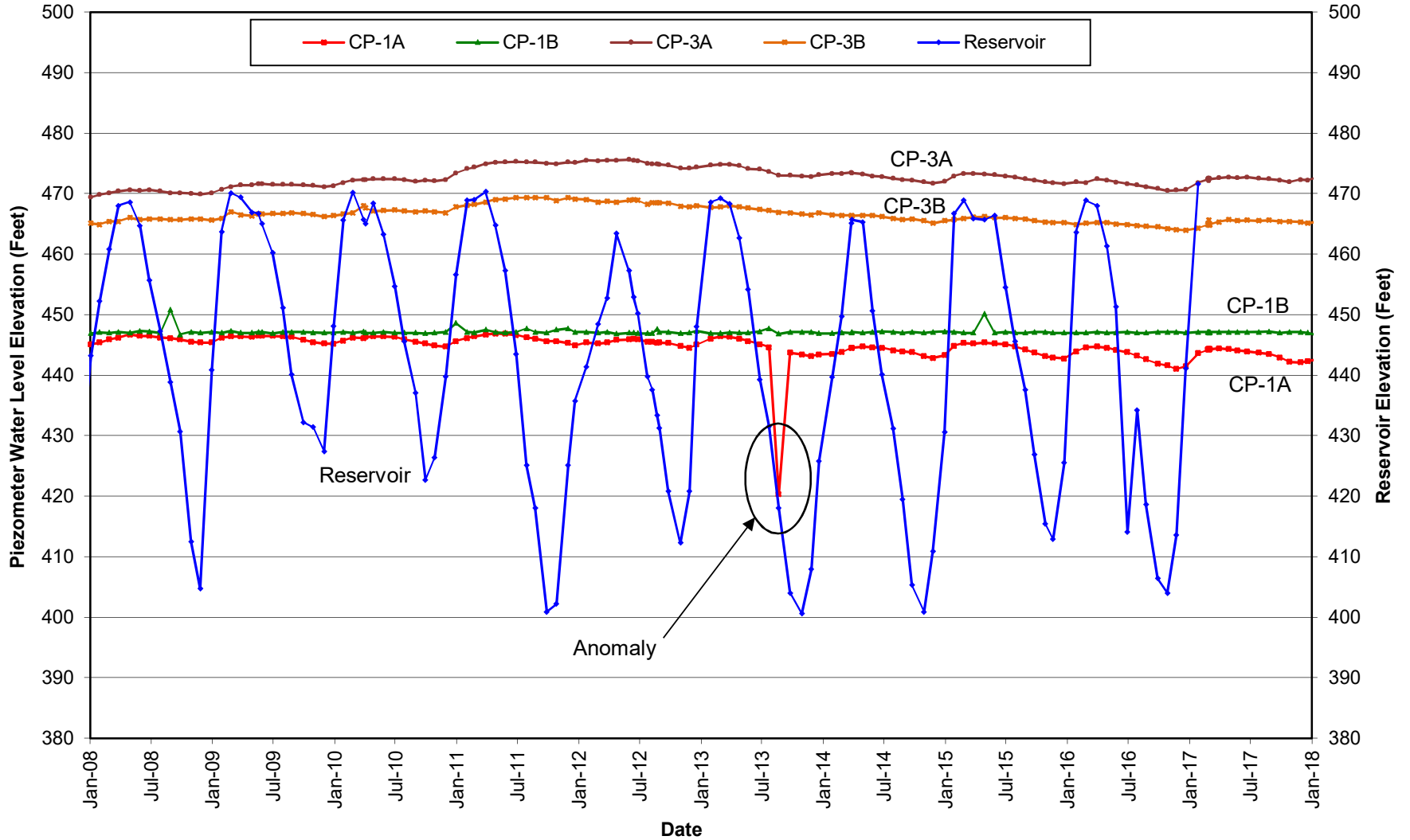
SAN JOAQUIN DAM 2-YR MONITORING WELL AND RESERVOIR WATER SURFACE ELEVATIONS MONITORING WELLS MW-4 AND MW-5 JANUARY 2016 THROUGH DECEMBER 2017



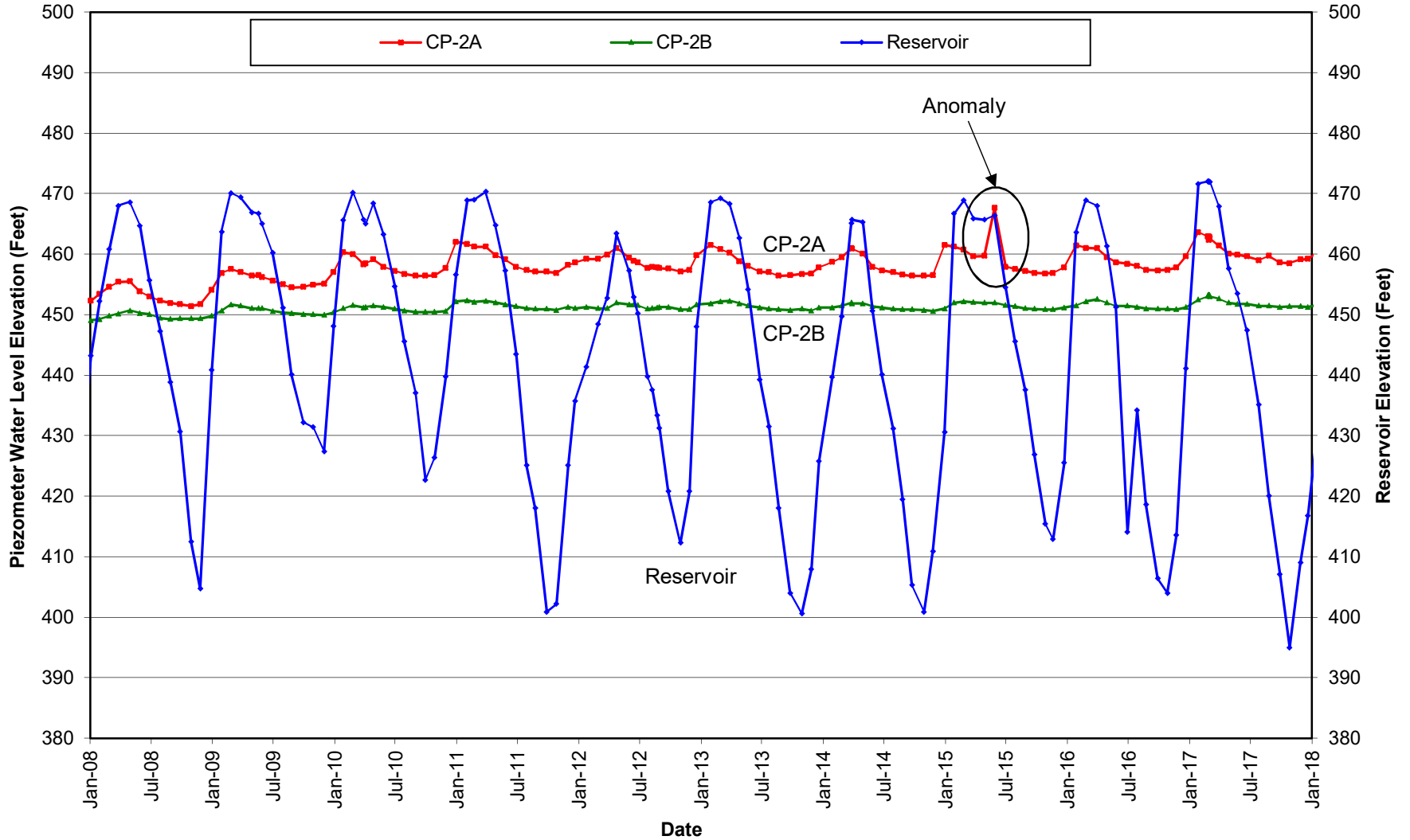
SAN JOAQUIN DAM 2-YR MONITORING WELL AND RESERVOIR WATER SURFACE ELEVATIONS MONITORING WELLS MW-7 AND MW-8 JANUARY 2015 THROUGH DECEMBER 2016



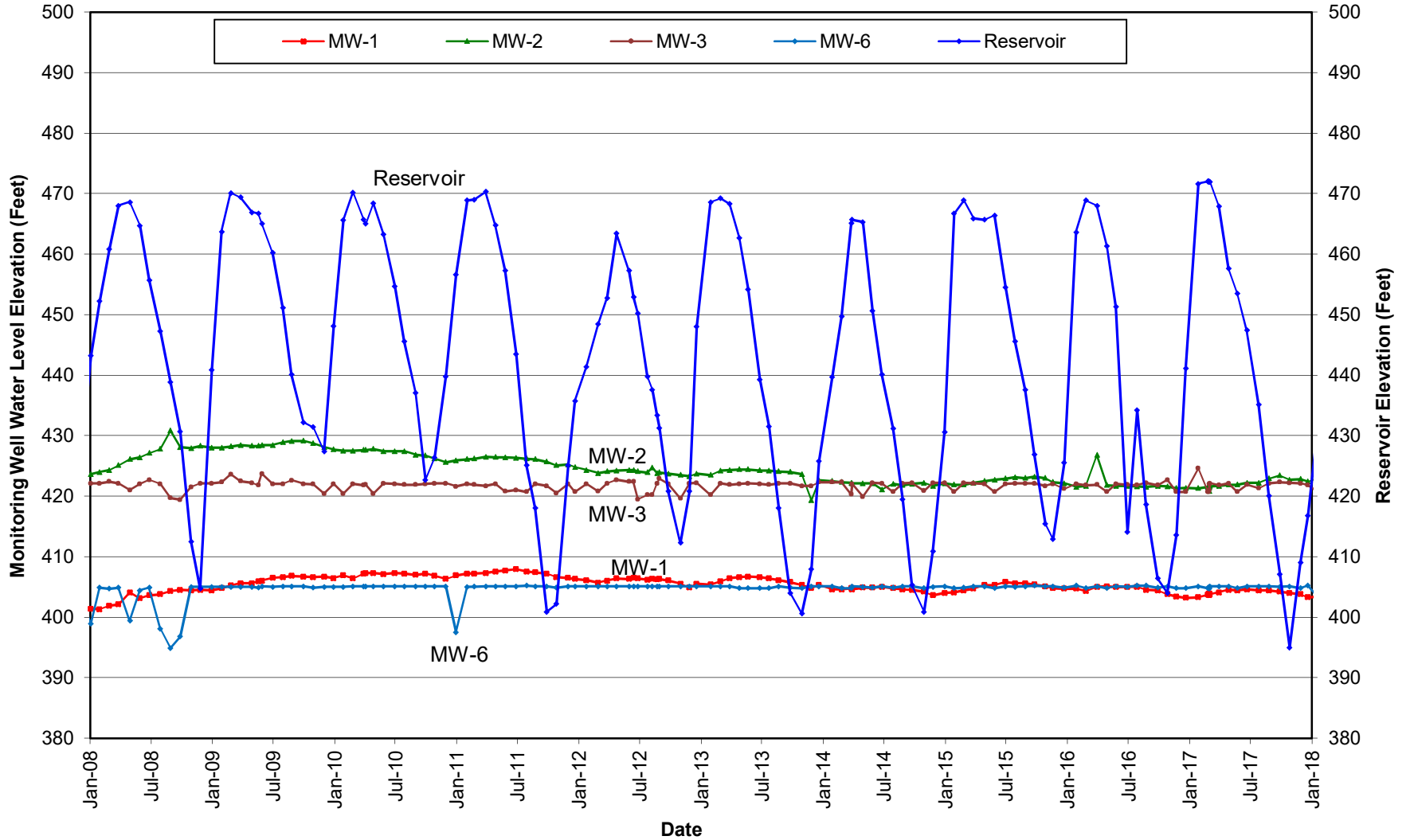
SAN JOAQUIN DAM 10-YR HISTORICAL PIEZOMETER AND RESERVOIR WATER SURFACE ELEVATIONS PIEZOMETERS CP-1A, CP-1B, CP-3A, AND CP-3B JANUARY 2008 THROUGH DECEMBER 2017



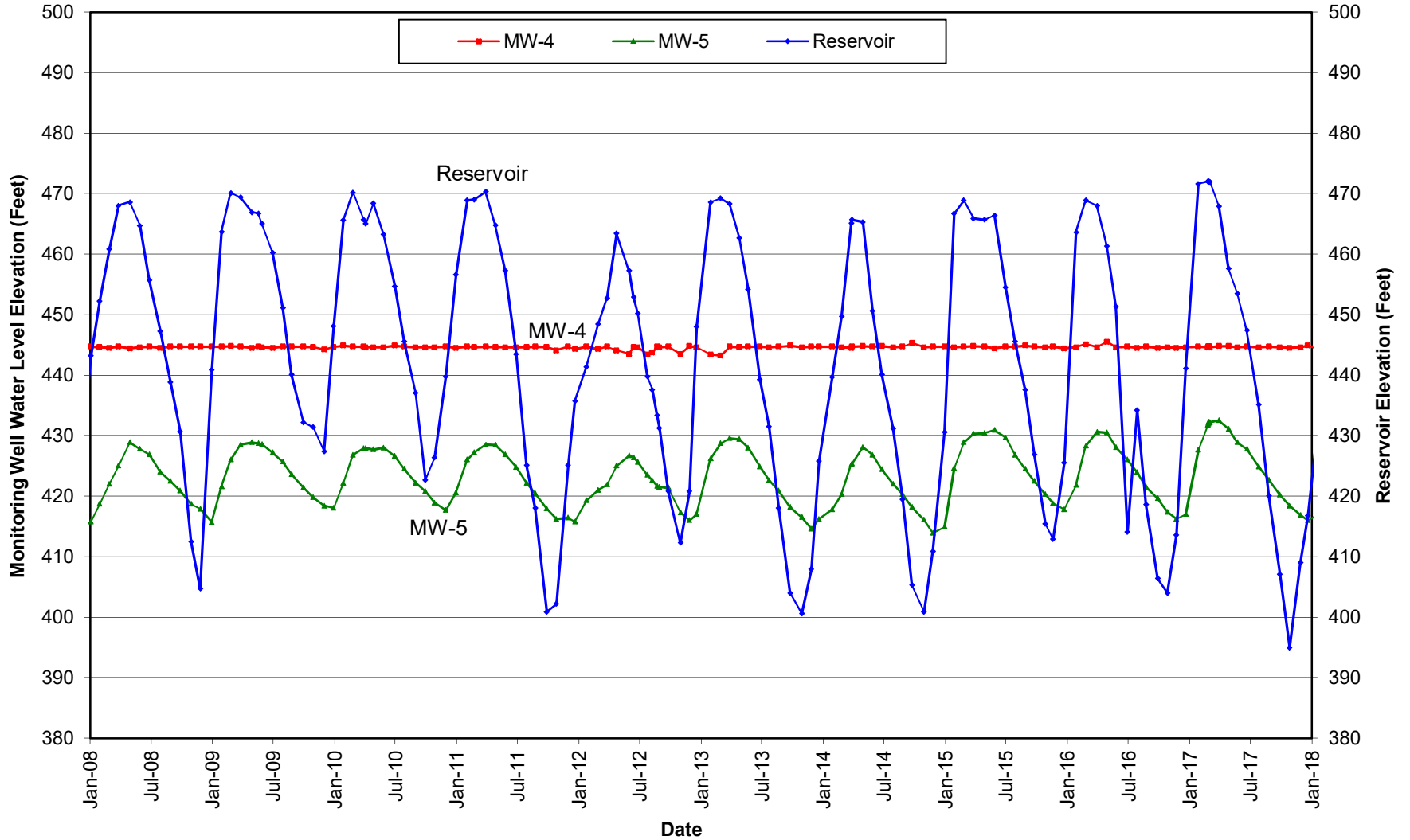
**SAN JOAQUIN DAM
10-YR HISTORICAL PIEZOMETER AND RESERVOIR WATER SURFACE ELEVATIONS
PIEZOMETERS CP-2A AND CP-2B
JANUARY 2008 THROUGH DECEMBER 2017**



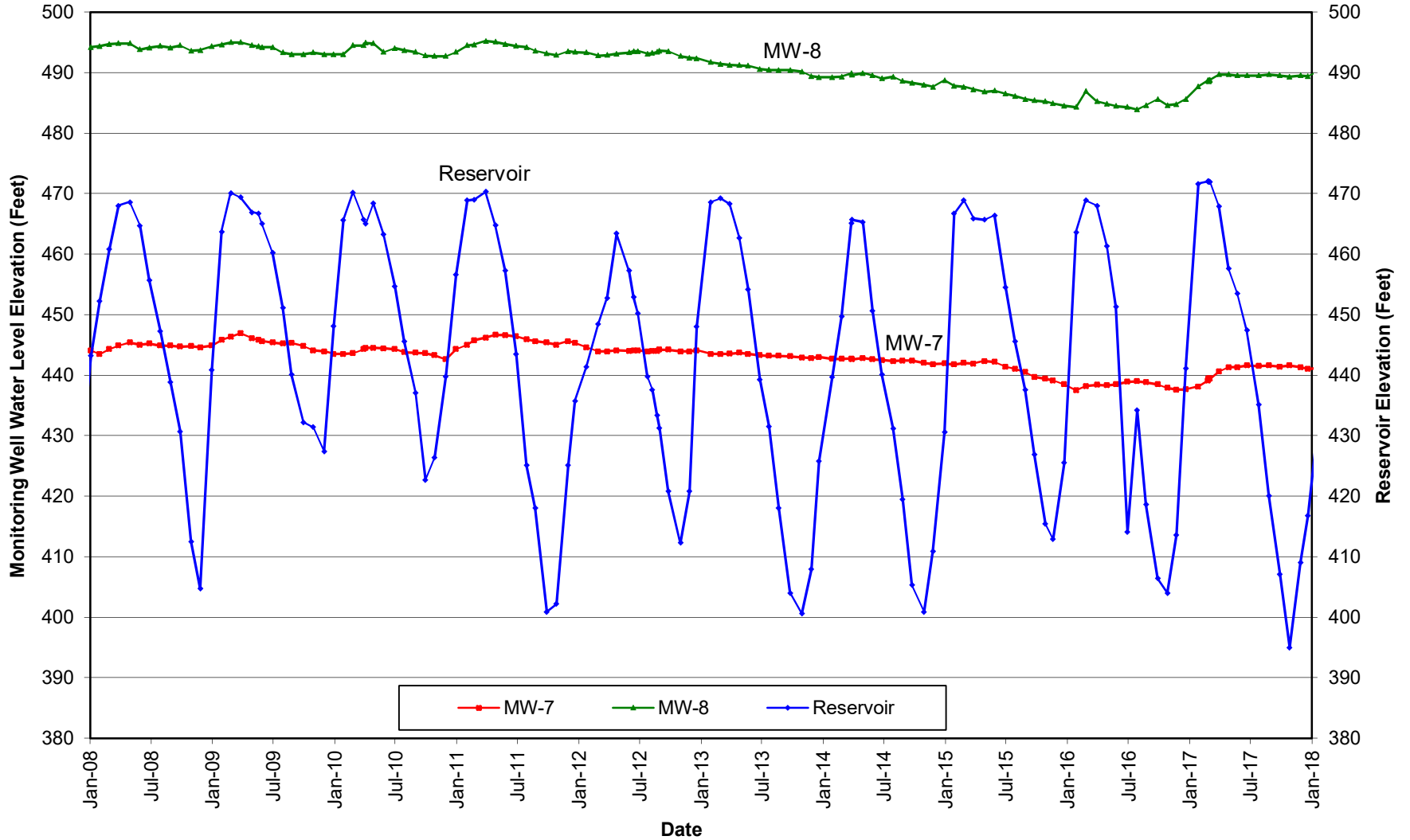
SAN JOAQUIN DAM 10-YR HISTORICAL MONITORING WELL AND RESERVOIR WATER SURFACE ELEVATIONS MONITORING WELLS MW-1, MW-2, MW-3, AND MW-6 JANUARY 2008 THROUGH DECEMBER 2017



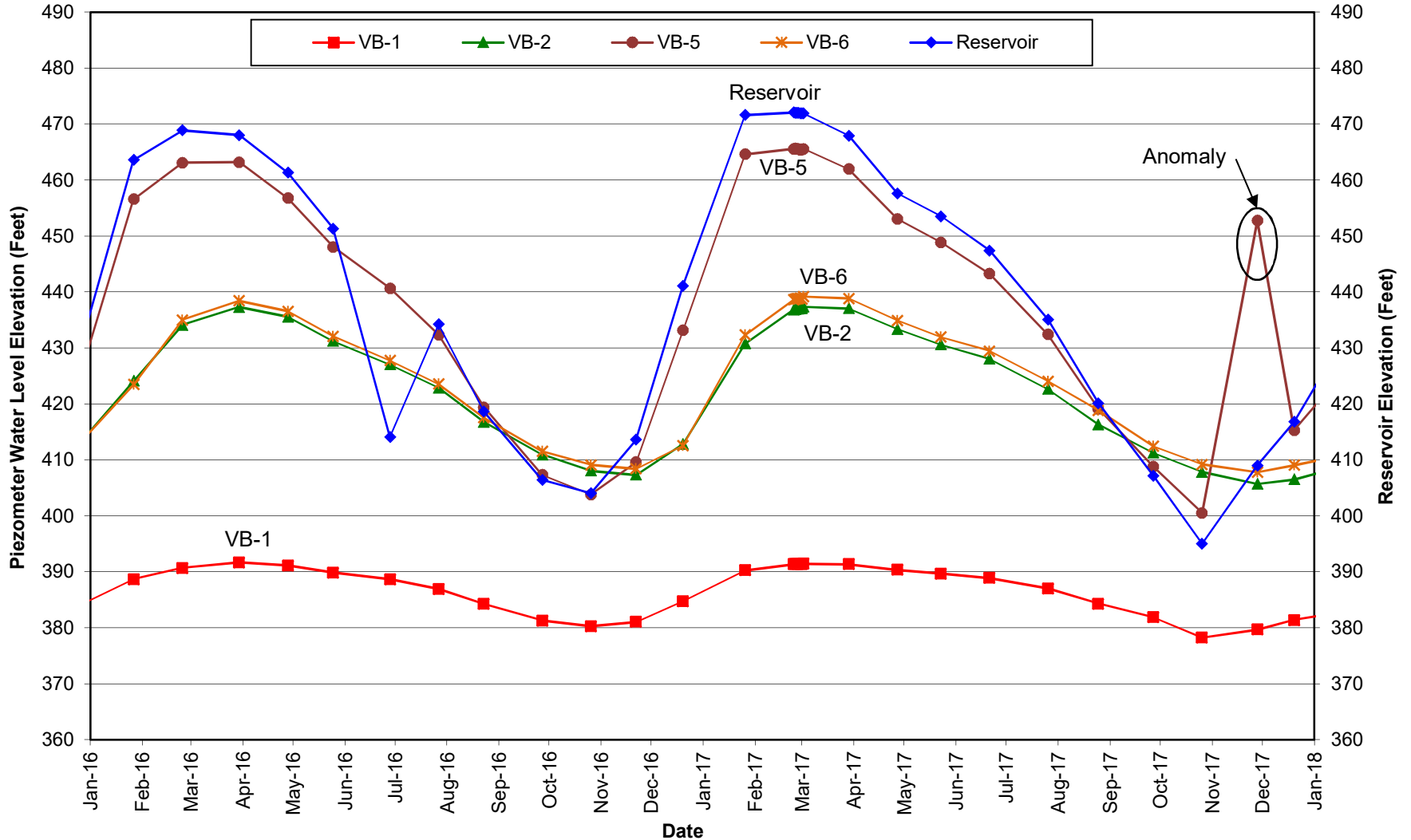
**SAN JOAQUIN DAM
10-YR HISTORICAL MONITORING WELL AND RESERVOIR WATER SURFACE ELEVATIONS
MONITORING WELLS MW-4 AND MW-5
JANUARY 2008 THROUGH DECEMBER 2017**



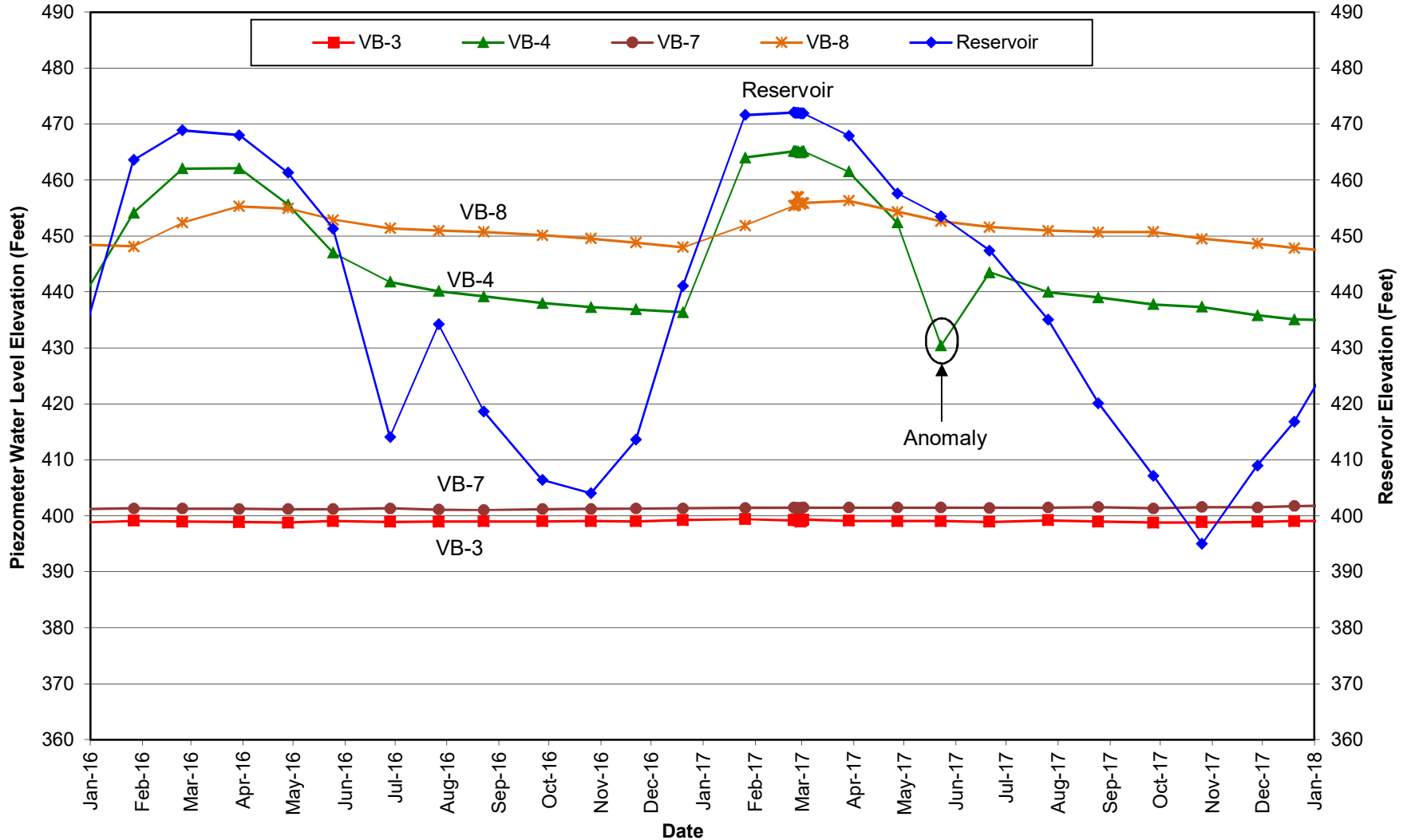
SAN JOAQUIN DAM 10-YR HISTORICAL MONITORING WELL AND RESERVOIR WATER SURFACE ELEVATIONS MONITORING WELLS MW-7 AND MW-8 JANUARY 2008 THROUGH DECEMBER 2017



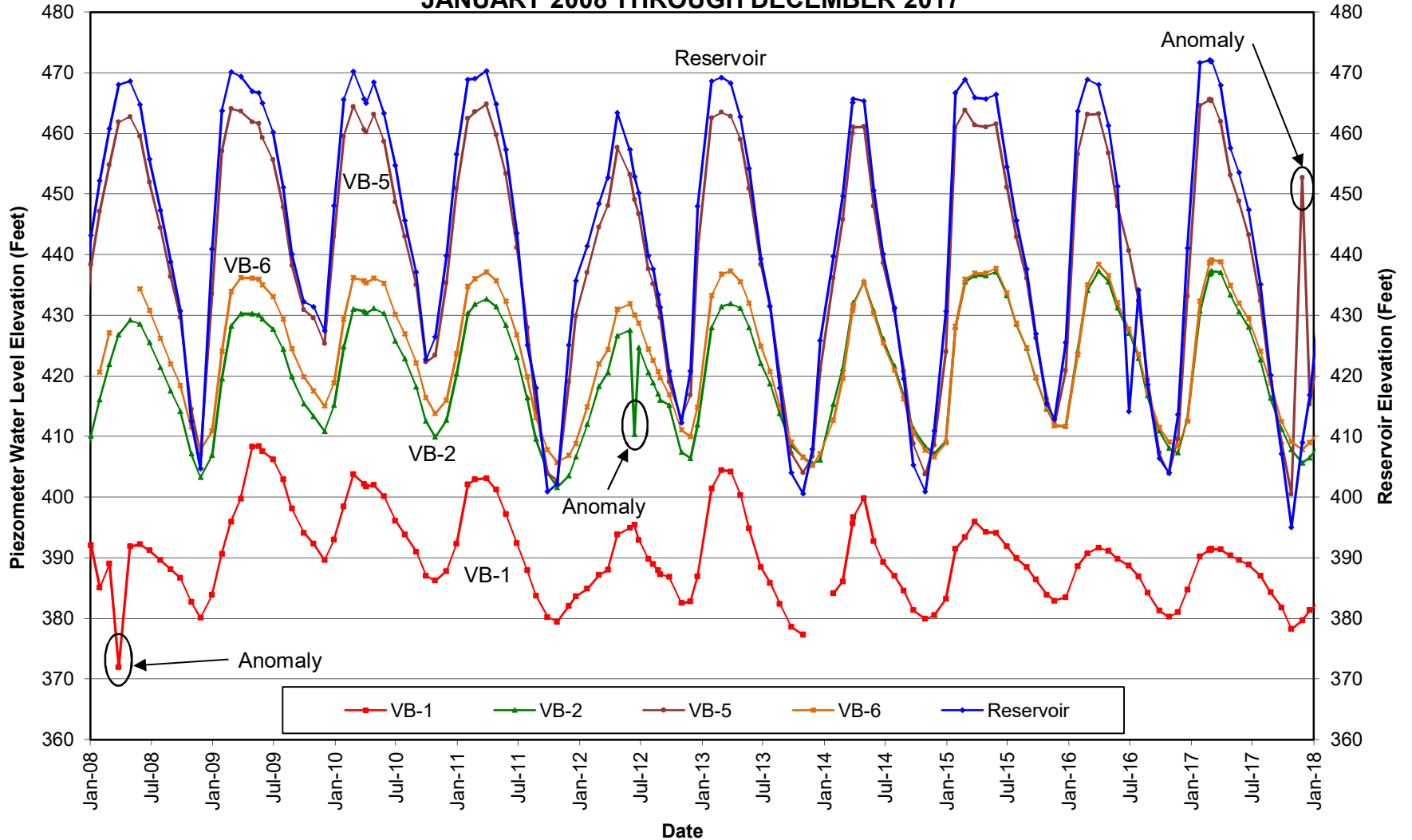
**SAN JOAQUIN DAM
2-YR VIBRATING WIRE PIEZOMETER AND RESERVOIR WATER SURFACE ELEVATIONS
PIEZOMETERS VB-1, VB-2, VB-5, AND VB-6
JANUARY 2016 THROUGH DECEMBER 2017**



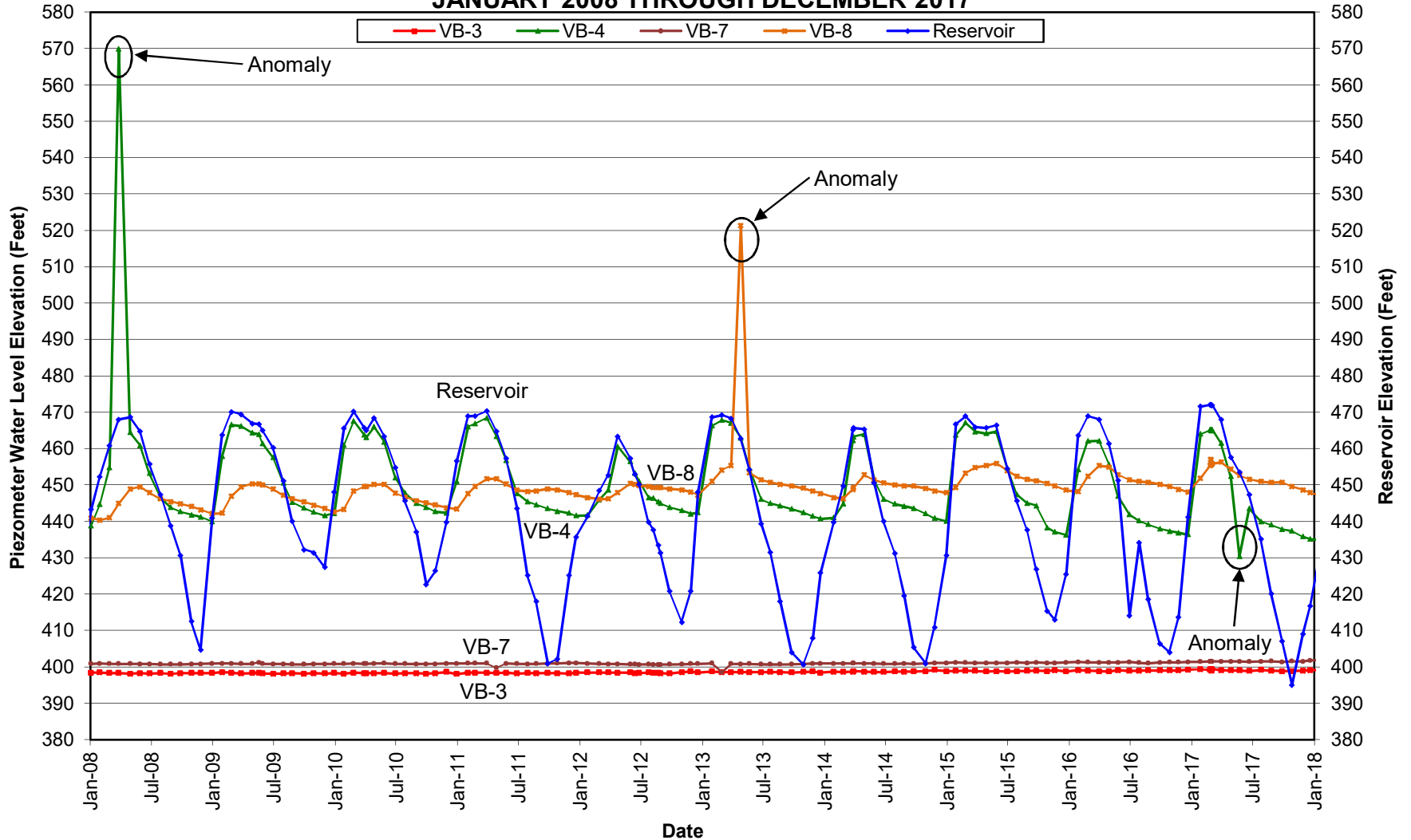
**SAN JOAQUIN DAM
2-YR VIBRATING WIRE PIEZOMETER AND RESERVOIR WATER SURFACE ELEVATIONS
PIEZOMETERS VB-3, VB-4, VB-7, AND VB-8
JANUARY 2016 THROUGH DECEMBER 2017**



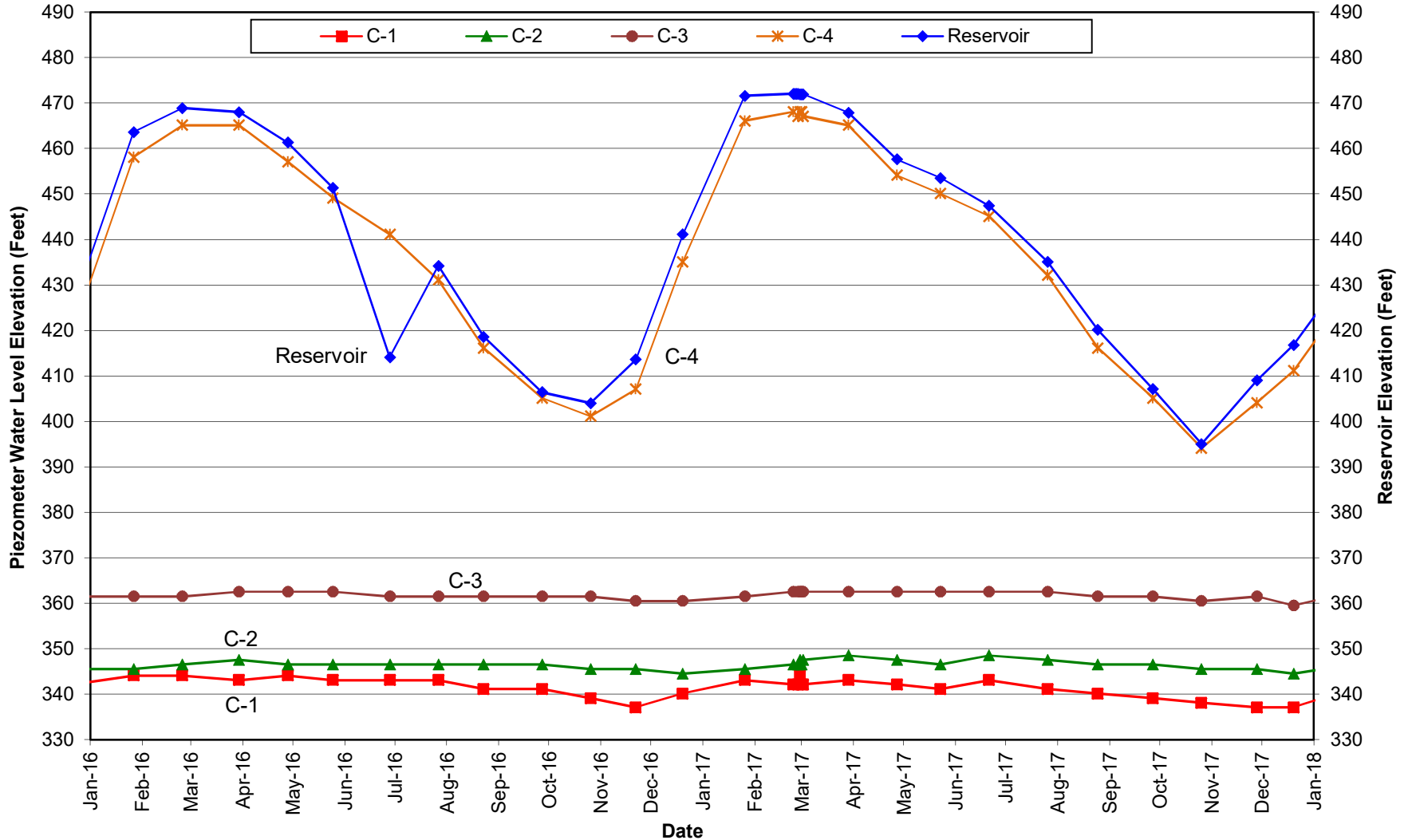
SAN JOAQUIN DAM 10-YR HISTORICAL VIBRATING WIRE PIEZOMETER AND RESERVOIR WATER SURFACE ELEVATIONS PIEZOMETERS VB-1, VB-2, VB-5, AND VB-6 JANUARY 2008 THROUGH DECEMBER 2017



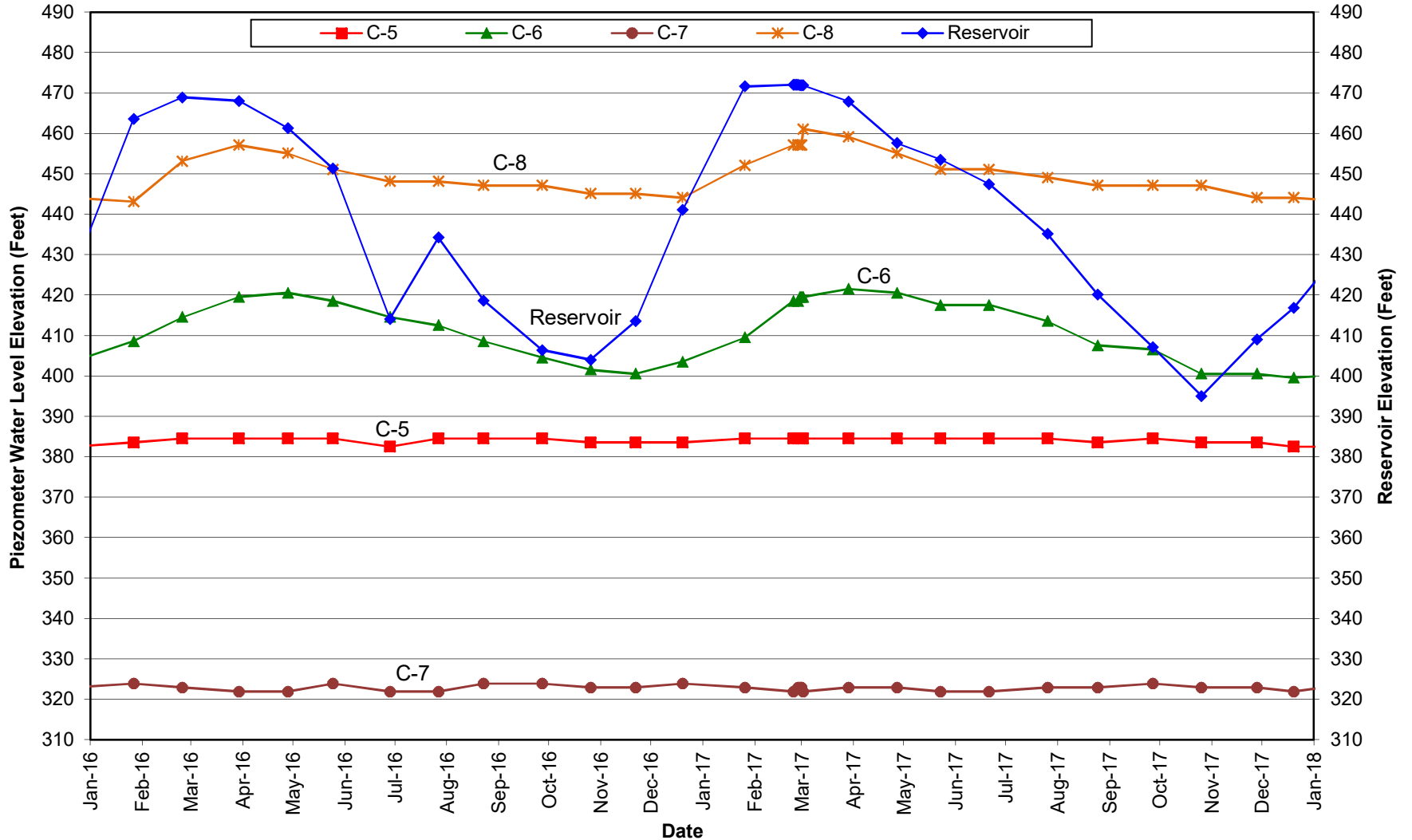
SAN JOAQUIN DAM 10-YR HISTORICAL VIBRATING WIRE PIEZOMETER AND RESERVOIR WATER SURFACE ELEVATIONS PIEZOMETERS VB-3, VB-4, VB-7, AND VB-8 JANUARY 2008 THROUGH DECEMBER 2017



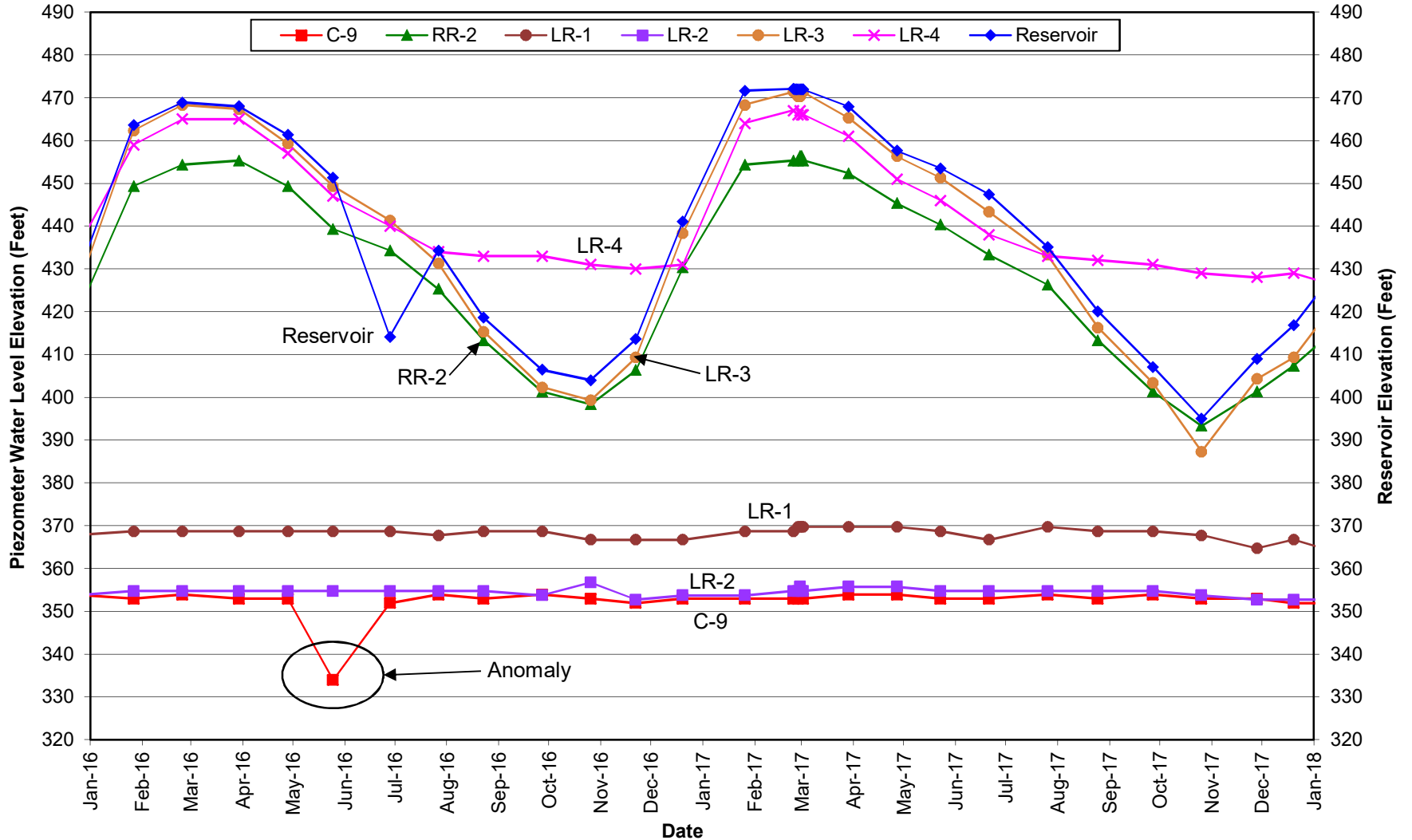
**SAN JOAQUIN DAM
2-YR PNEUMATIC PIEZOMETER AND RESERVOIR WATER SURFACE ELEVATIONS
PIEZOMETERS C-1, C-2, C-3, AND C-4
JANUARY 2016 THROUGH DECEMBER 2017**



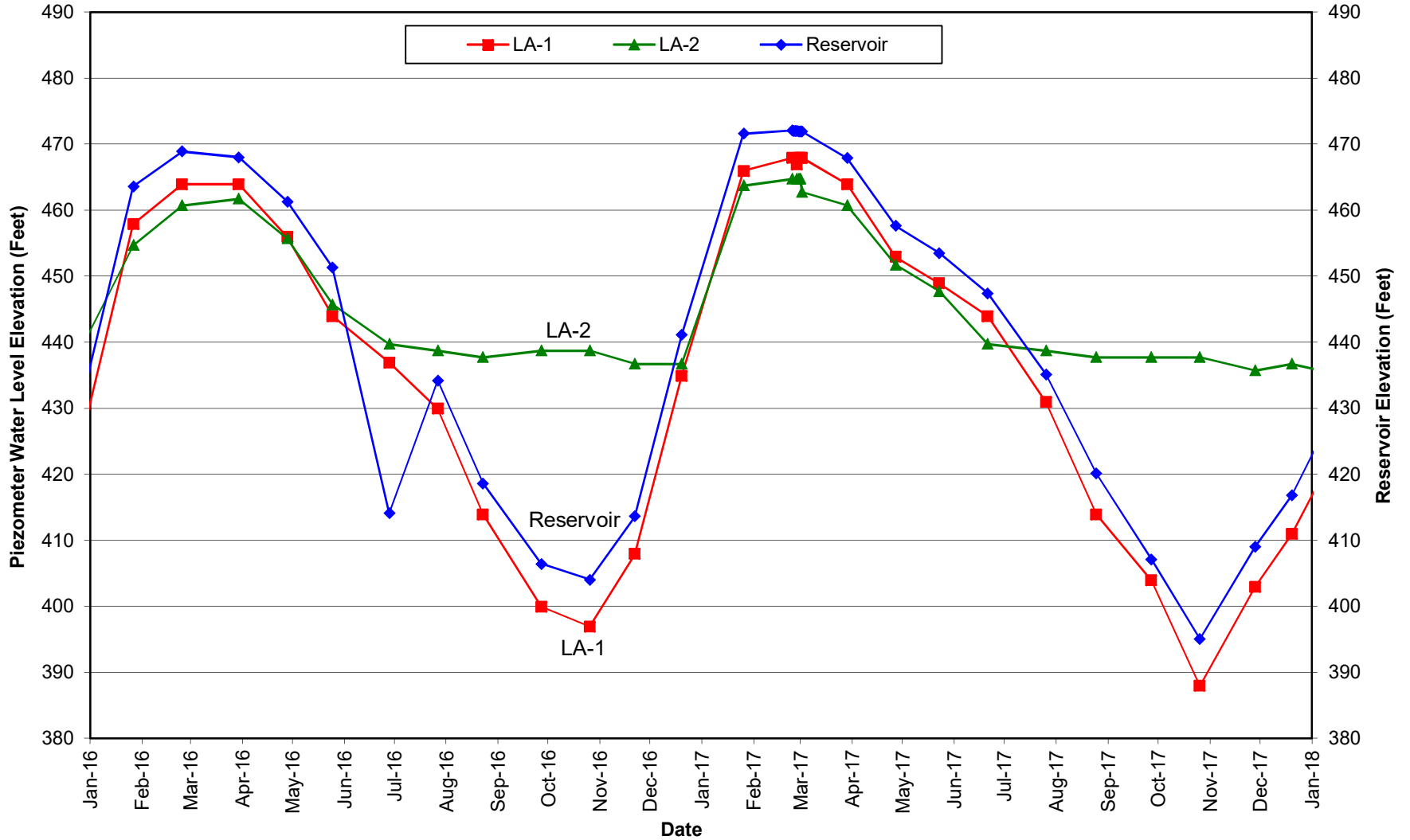
**SAN JOAQUIN DAM
2-YR PNEUMATIC PIEZOMETER AND RESERVOIR WATER SURFACE ELEVATIONS
PIEZOMETERS C-5, C-6, C-7, AND C-8
JANUARY 2016 THROUGH DECEMBER 2017**



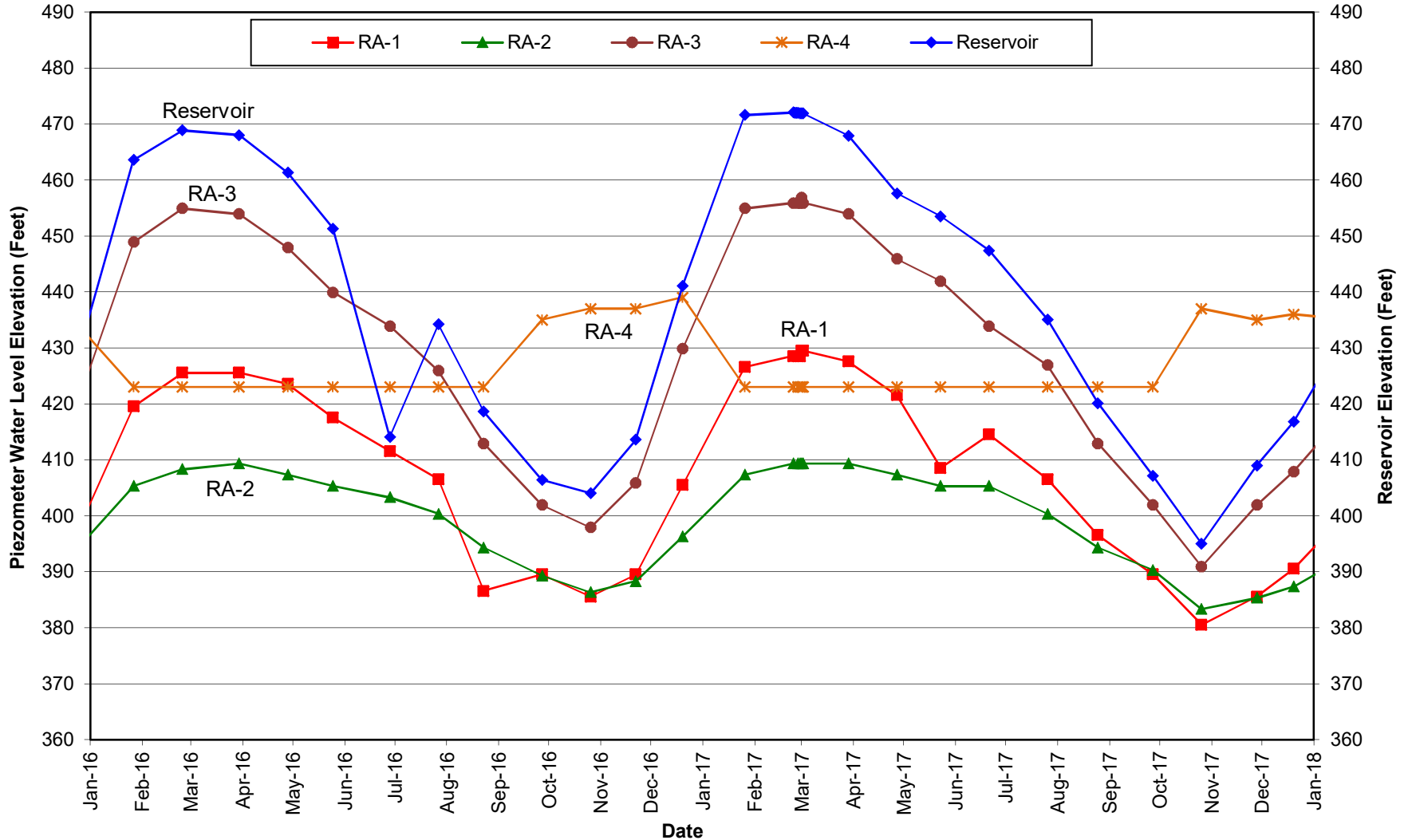
SAN JOAQUIN DAM 2-YR PNEUMATIC PIEZOMETER AND RESERVOIR WATER SURFACE ELEVATIONS PIEZOMETERS C-9, RR-2, LR-1, LR-2, LR-3, AND LR-4 JANUARY 2016 THROUGH DECEMBER 2017



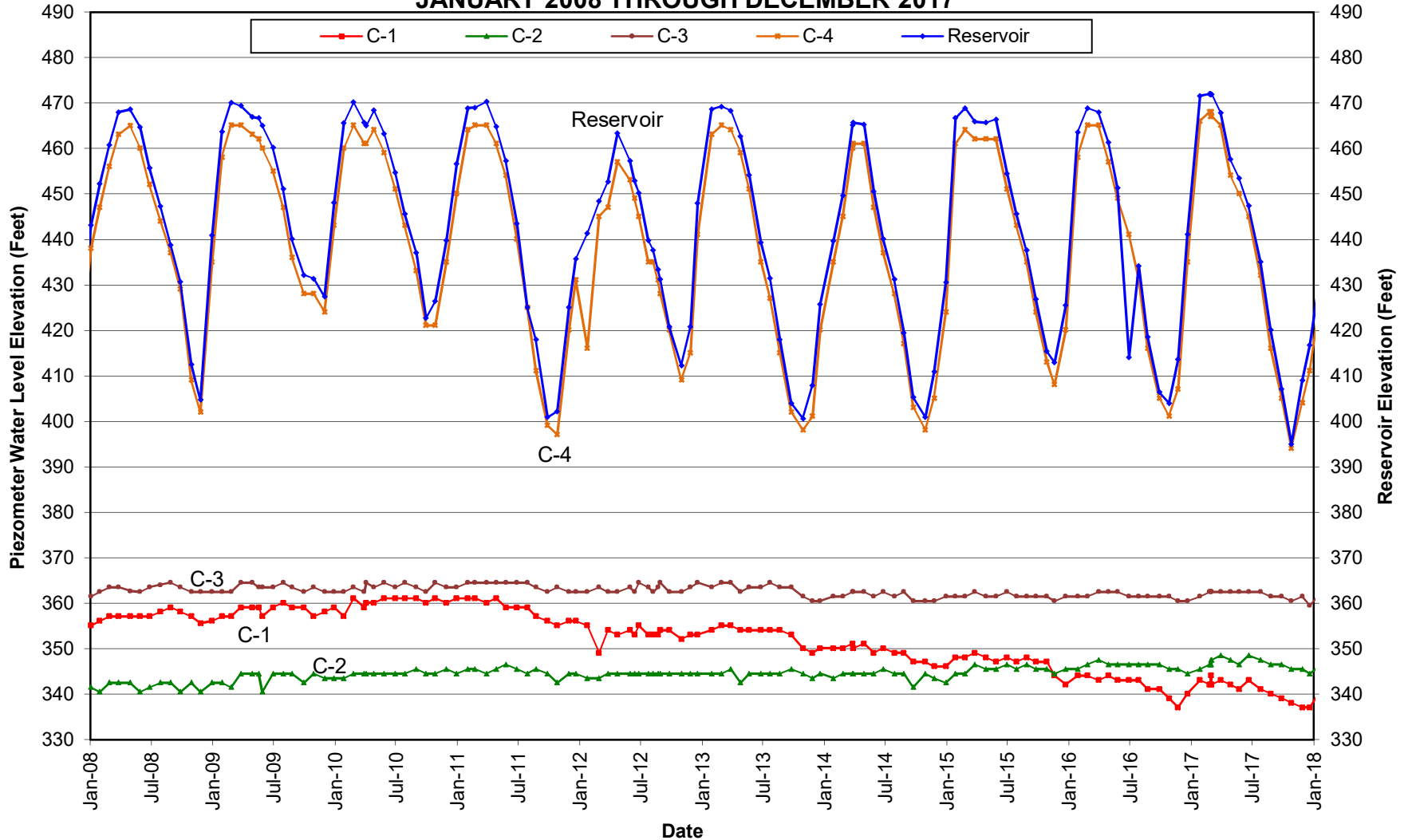
SAN JOAQUIN DAM 2-YR PNEUMATIC PIEZOMETER AND RESERVOIR WATER SURFACE ELEVATIONS PIEZOMETERS LA-1 AND LA-2 JANUARY 2016 THROUGH DECEMBER 2017



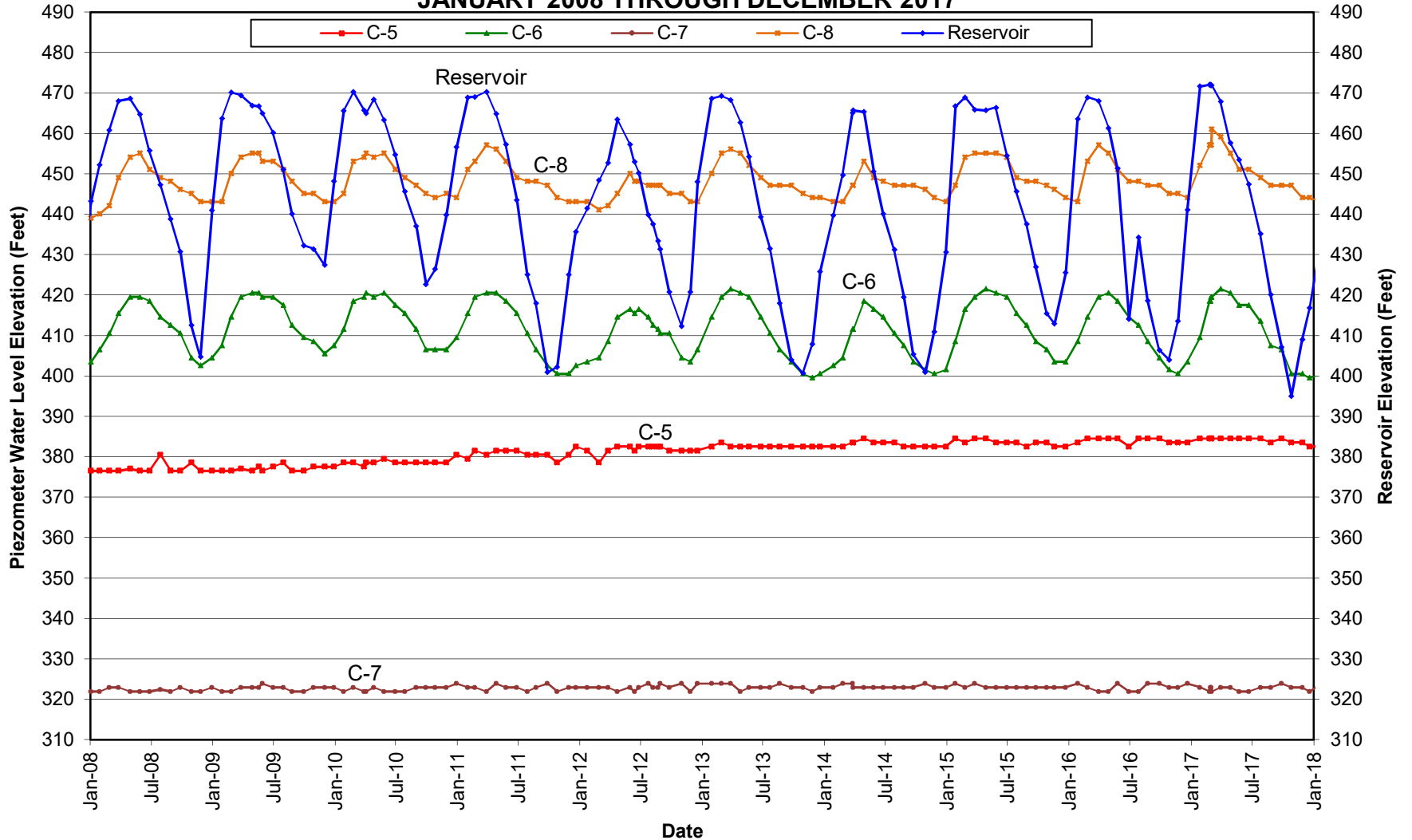
**SAN JOAQUIN DAM
2-YR PNEUMATIC PIEZOMETER AND RESERVOIR WATER SURFACE ELEVATIONS
PIEZOMETERS RA-1, RA-2, RA-3, AND RA-4
JANUARY 2016 THROUGH DECEMBER 2017**



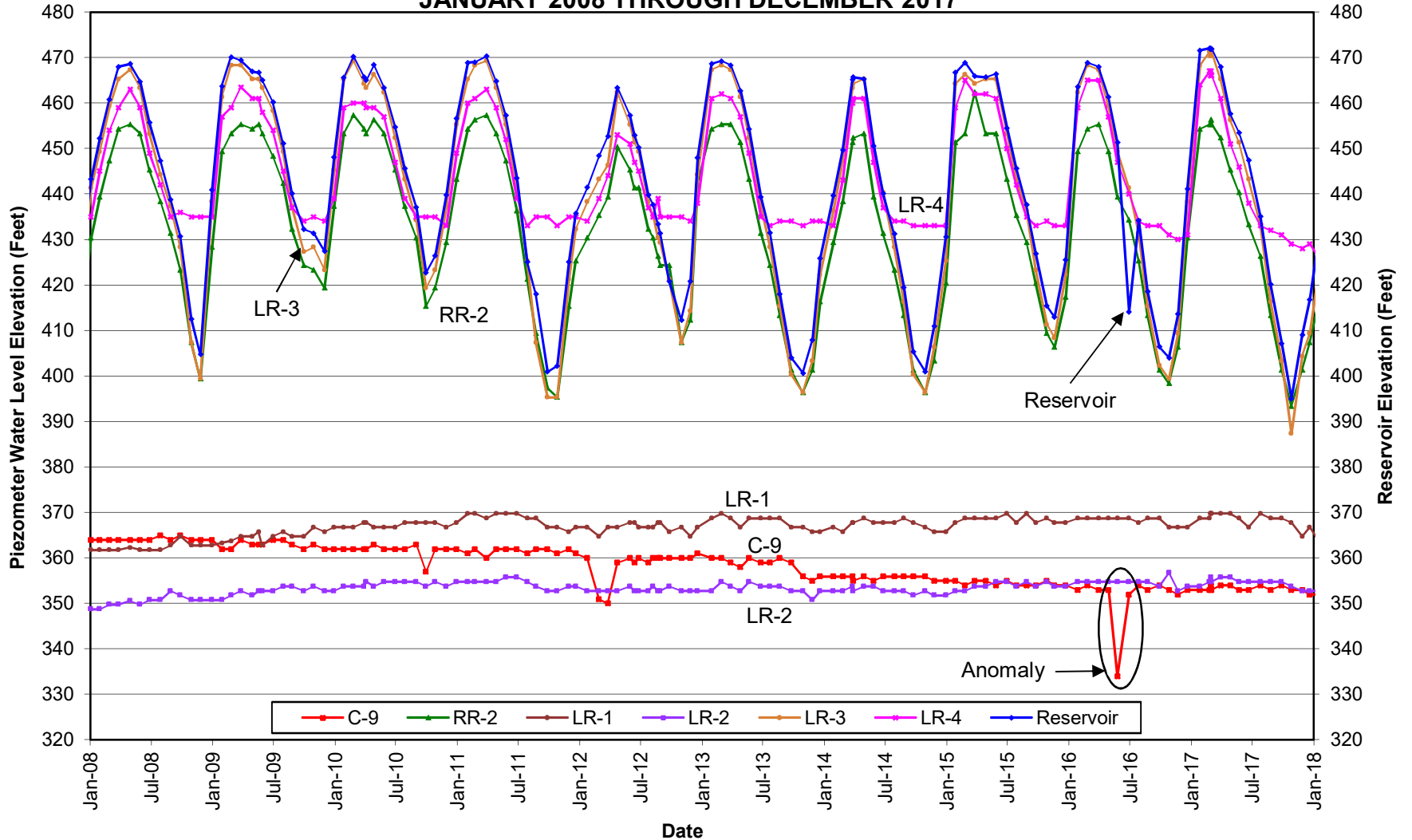
**SAN JOAQUIN DAM
10-YR HISTORICAL PNEUMATIC PIEZOMETER AND
RESERVOIR WATER SURFACE ELEVATIONS
PIEZOMETERS C-1, C-2, C-3, AND C-4
JANUARY 2008 THROUGH DECEMBER 2017**



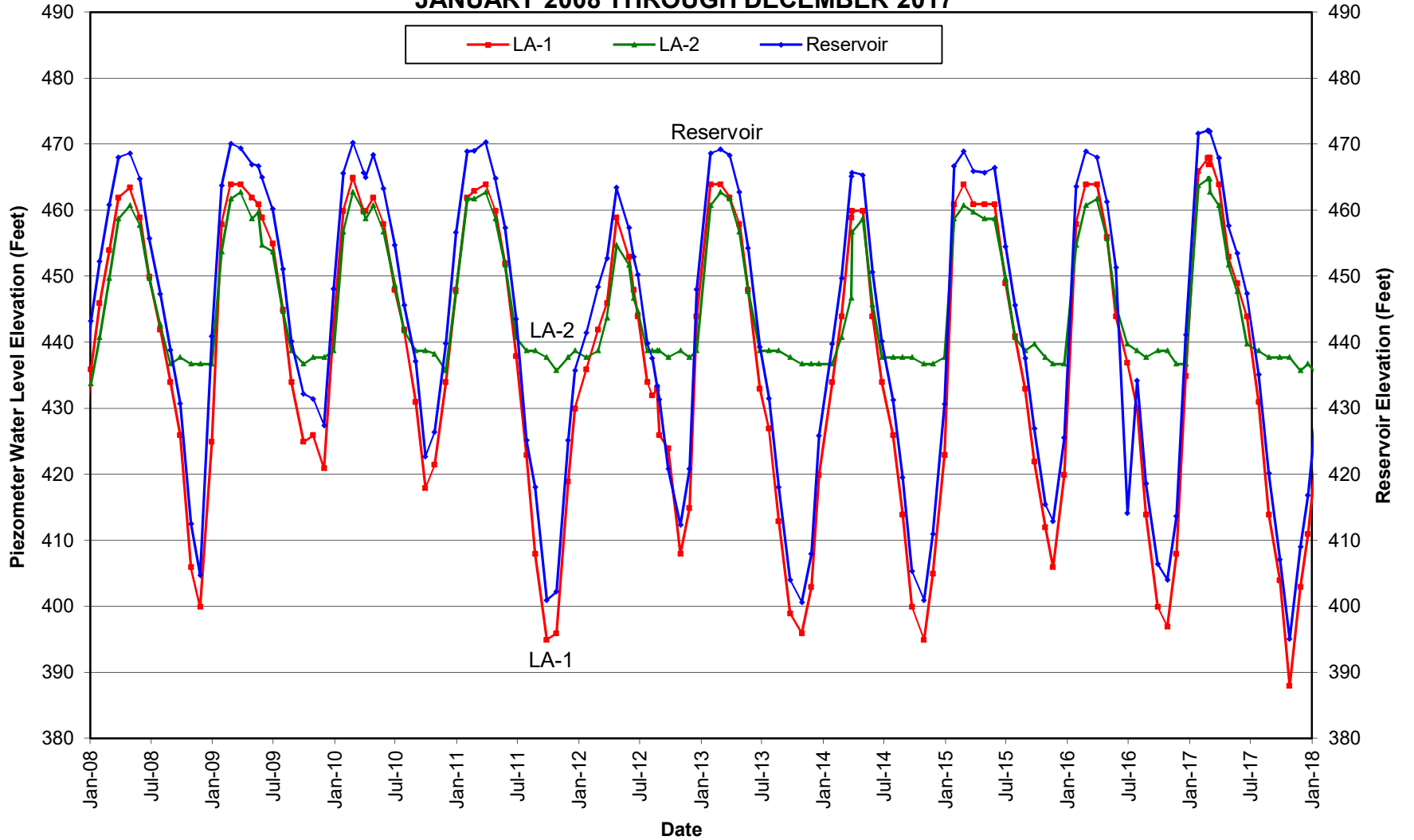
**SAN JOAQUIN DAM
10-YR HISTORICAL PNEUMATIC PIEZOMETER AND
RESERVOIR WATER SURFACE ELEVATIONS
PIEZOMETERS C-5, C-6, C-7, AND C-8
JANUARY 2008 THROUGH DECEMBER 2017**



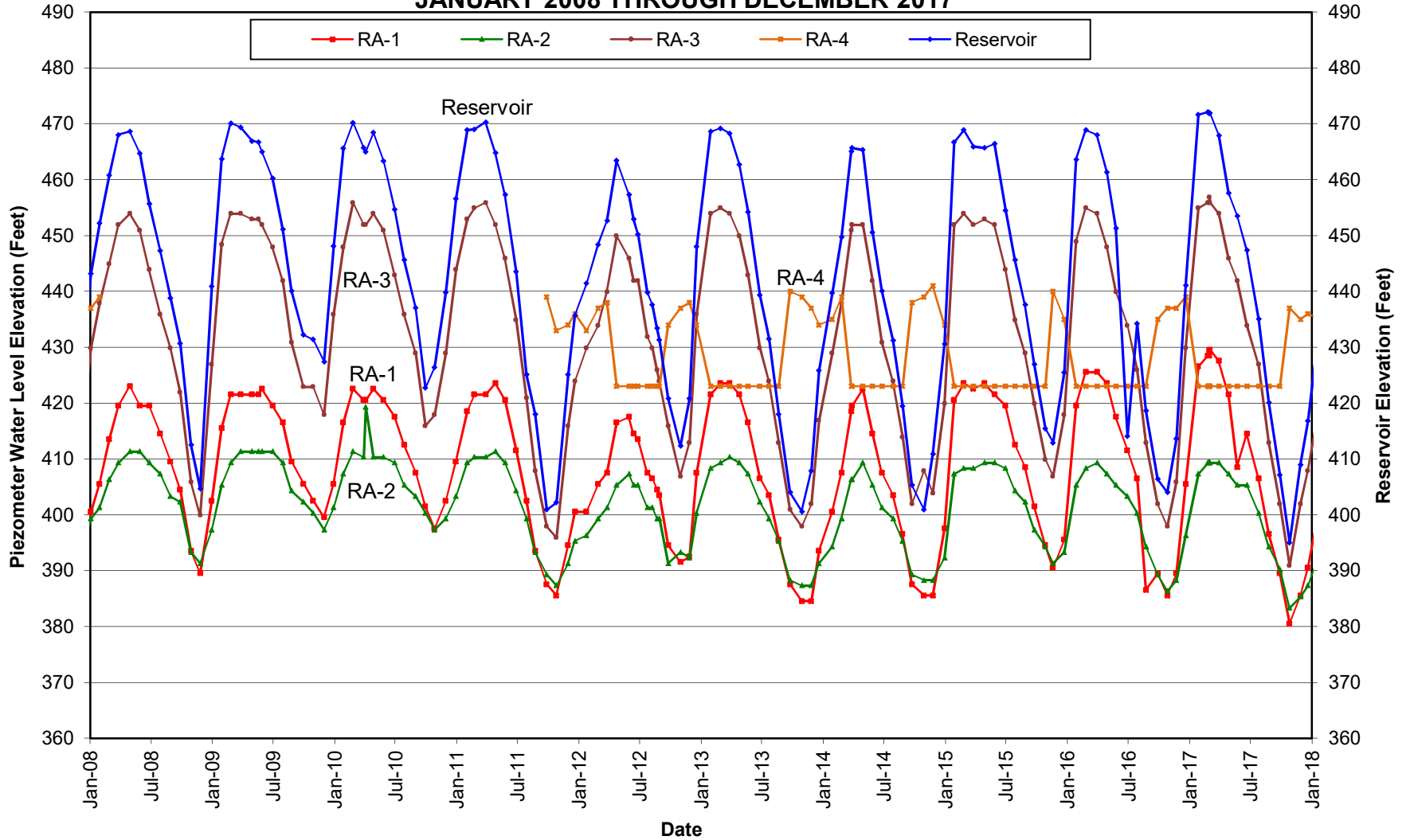
SAN JOAQUIN DAM 10-YR HISTORICAL PNEUMATIC PIEZOMETER AND RESERVOIR WATER SURFACE ELEVATIONS PIEZOMETERS C-9, RR-2, LR-1, LR-2, LR-3, AND LR-4 JANUARY 2008 THROUGH DECEMBER 2017



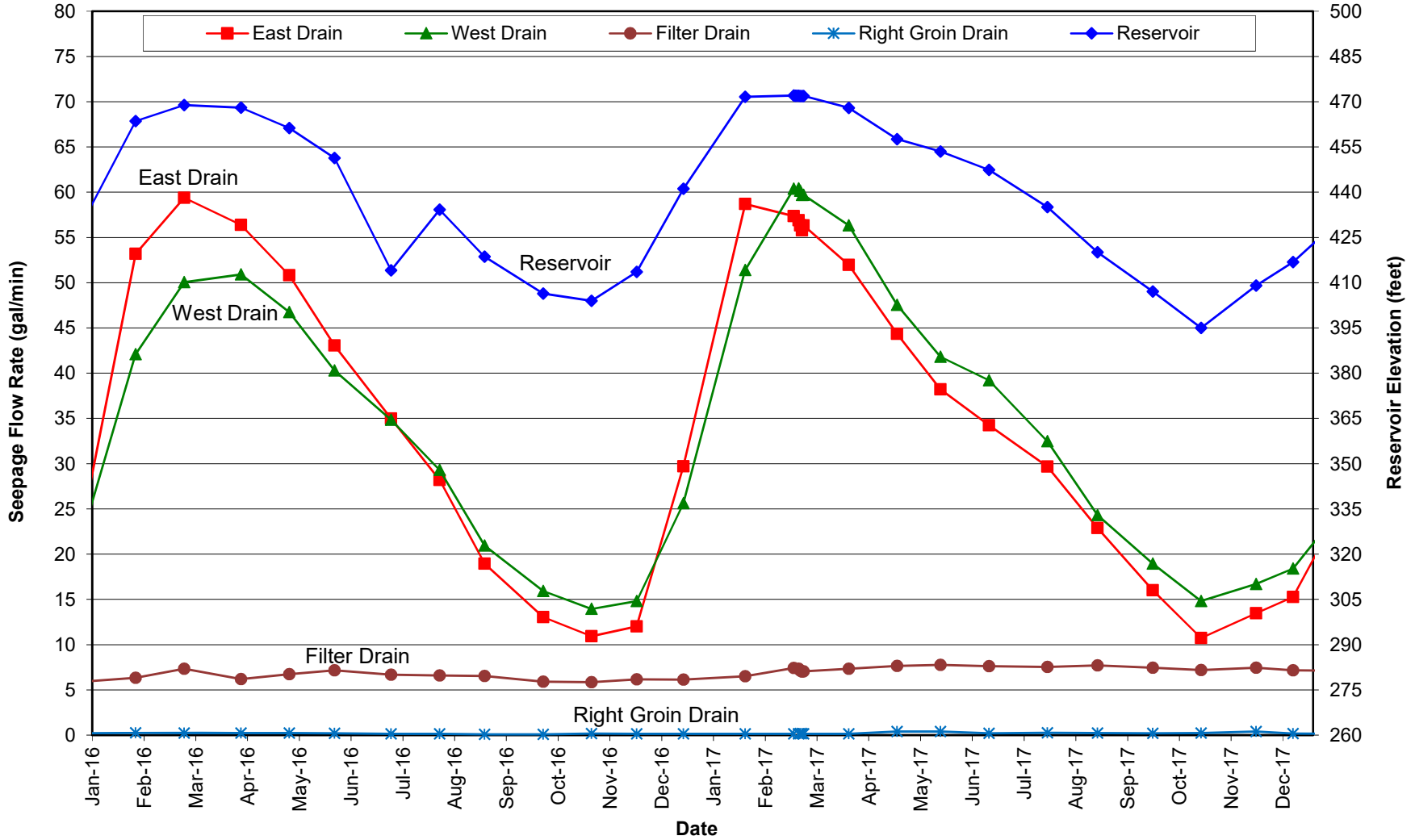
**SAN JOAQUIN DAM
10-YR HISTORICAL PNEUMATIC PIEZOMETER AND
RESERVOIR WATER SURFACE ELEVATIONS
PIEZOMETERS LA-1 AND LA-2
JANUARY 2008 THROUGH DECEMBER 2017**



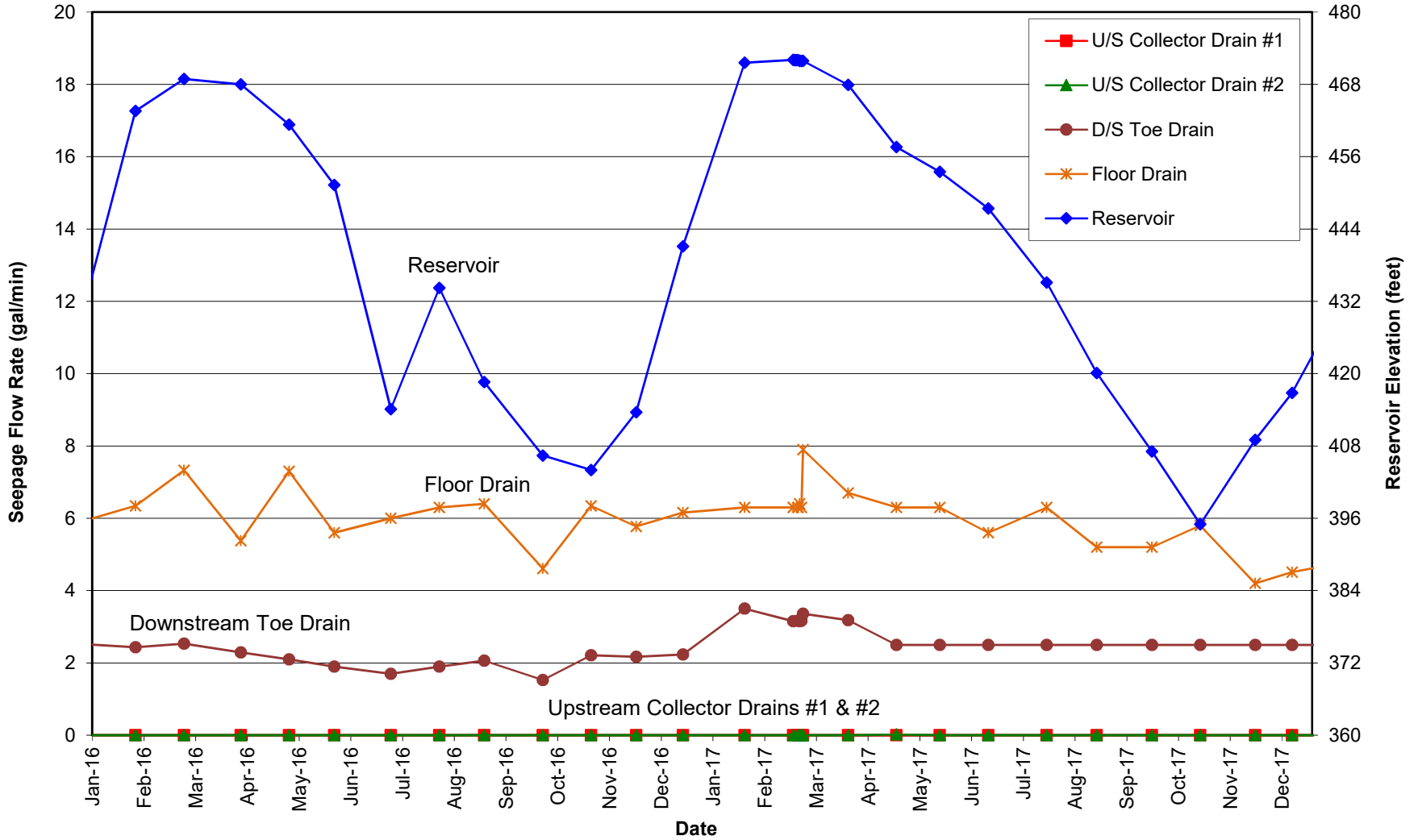
**SAN JOAQUIN DAM
10-YR HISTORICAL PNEUMATIC PIEZOMETER AND
RESERVOIR WATER SURFACE ELEVATIONS
PIEZOMETERS RA-1, RA-2, RA-3, AND RA-4
JANUARY 2008 THROUGH DECEMBER 2017**



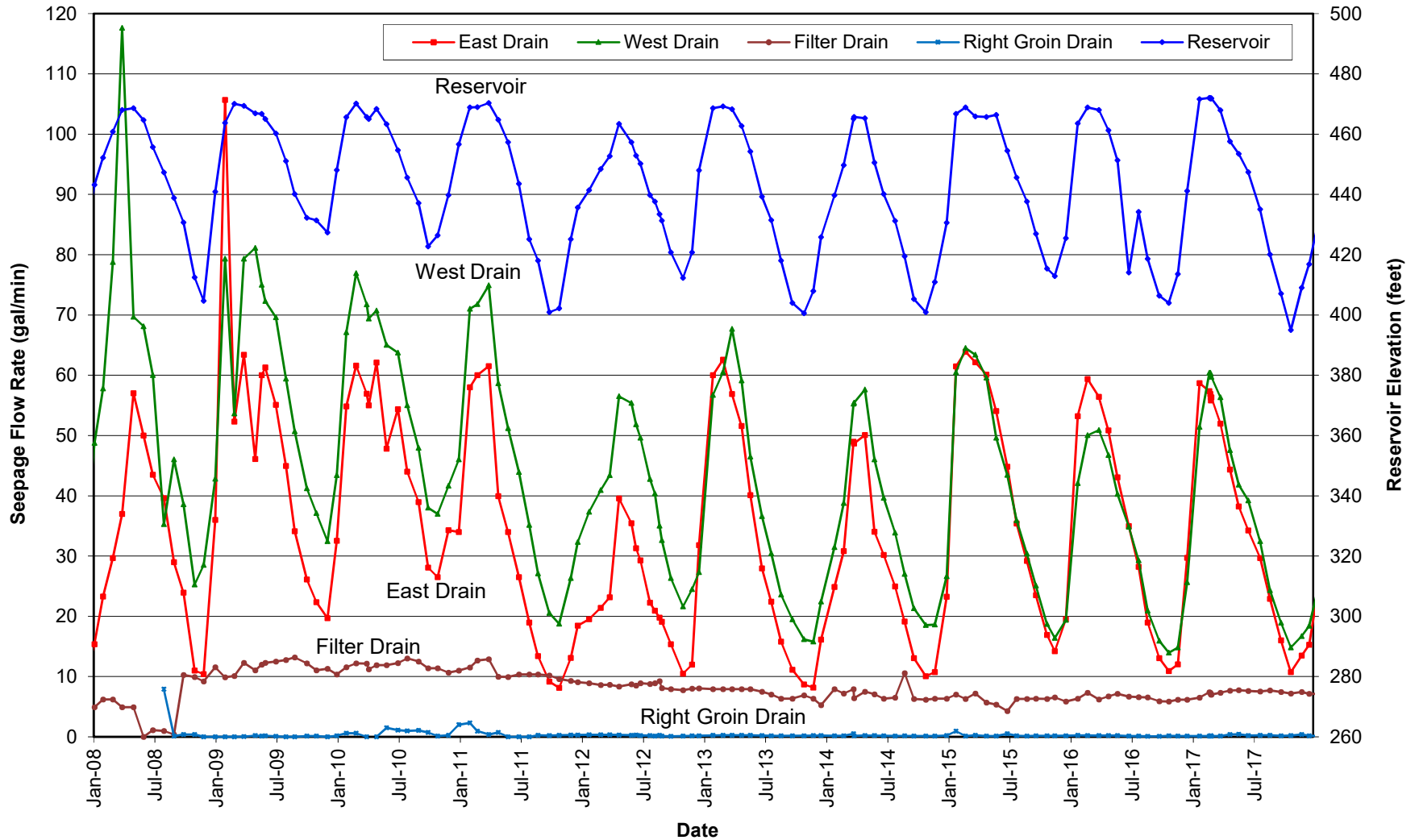
SAN JOAQUIN DAM 2-YR SEEPAGE FLOW RATES EAST DRAIN, WEST DRAIN, FILTER DRAIN, AND RIGHT GROIN DRAIN JANUARY 2016 THROUGH DECEMBER 2017



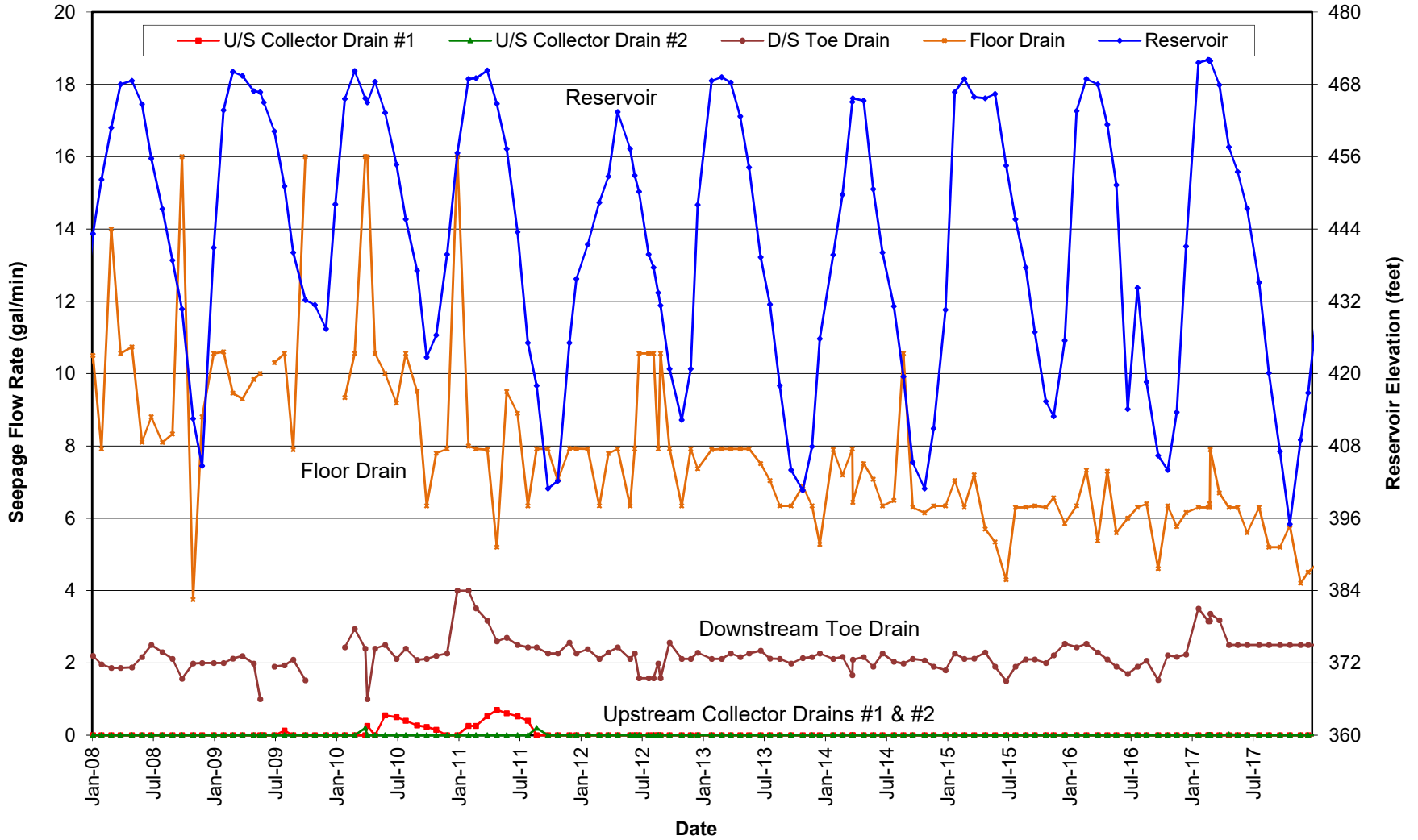
SAN JOAQUIN DAM 2-YR SEEPAGE FLOW RATES UPSTREAM COLLECTOR DRAINS, DOWNSTREAM TOE DRAIN, AND FLOOR DRAIN JANUARY 2016 THROUGH DECEMBER 2017



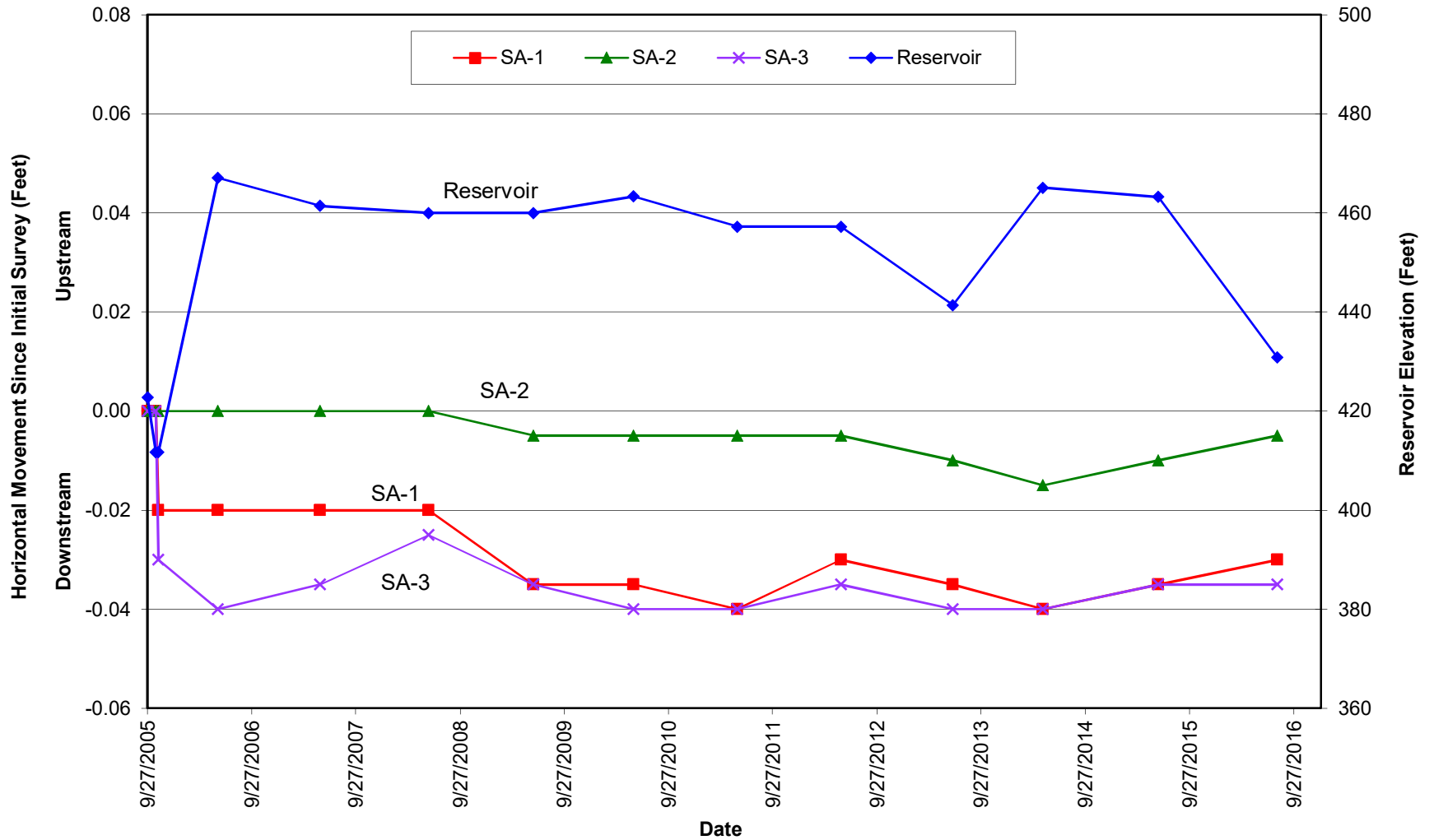
SAN JOAQUIN DAM 10-YR HISTORICAL SEEPAGE FLOW RATES EAST DRAIN, WEST DRAIN, FILTER DRAIN, AND RIGHT GROIN DRAIN JANUARY 2008 THROUGH DECEMBER 2017



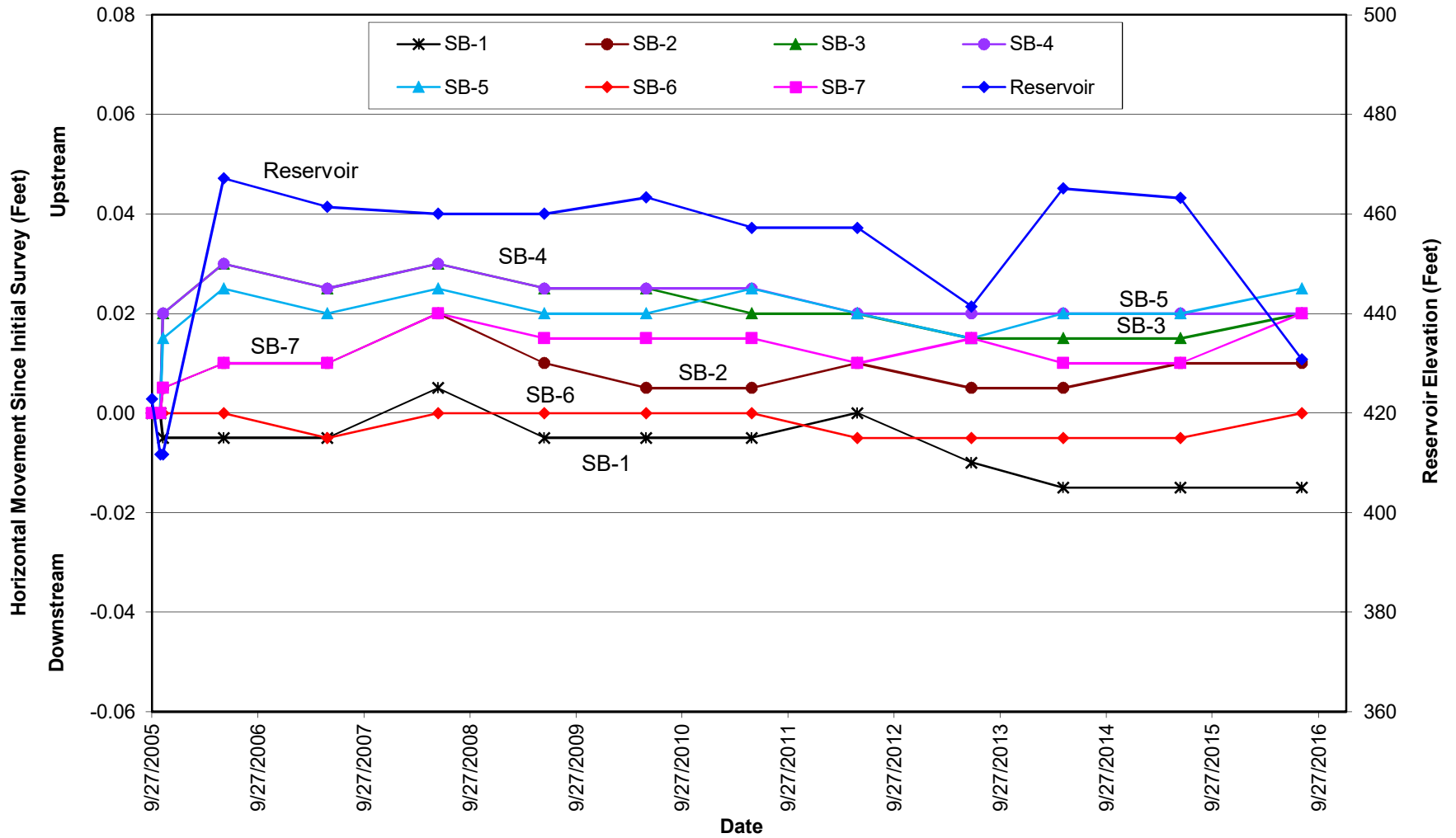
**SAN JOAQUIN DAM
10-YR HISTORICAL SEEPAGE FLOW RATES
UPSTREAM COLLECTOR DRAINS, DOWNSTREAM TOE DRAIN, AND FLOOR DRAIN
JANUARY 2008 THROUGH DECEMBER 2017**



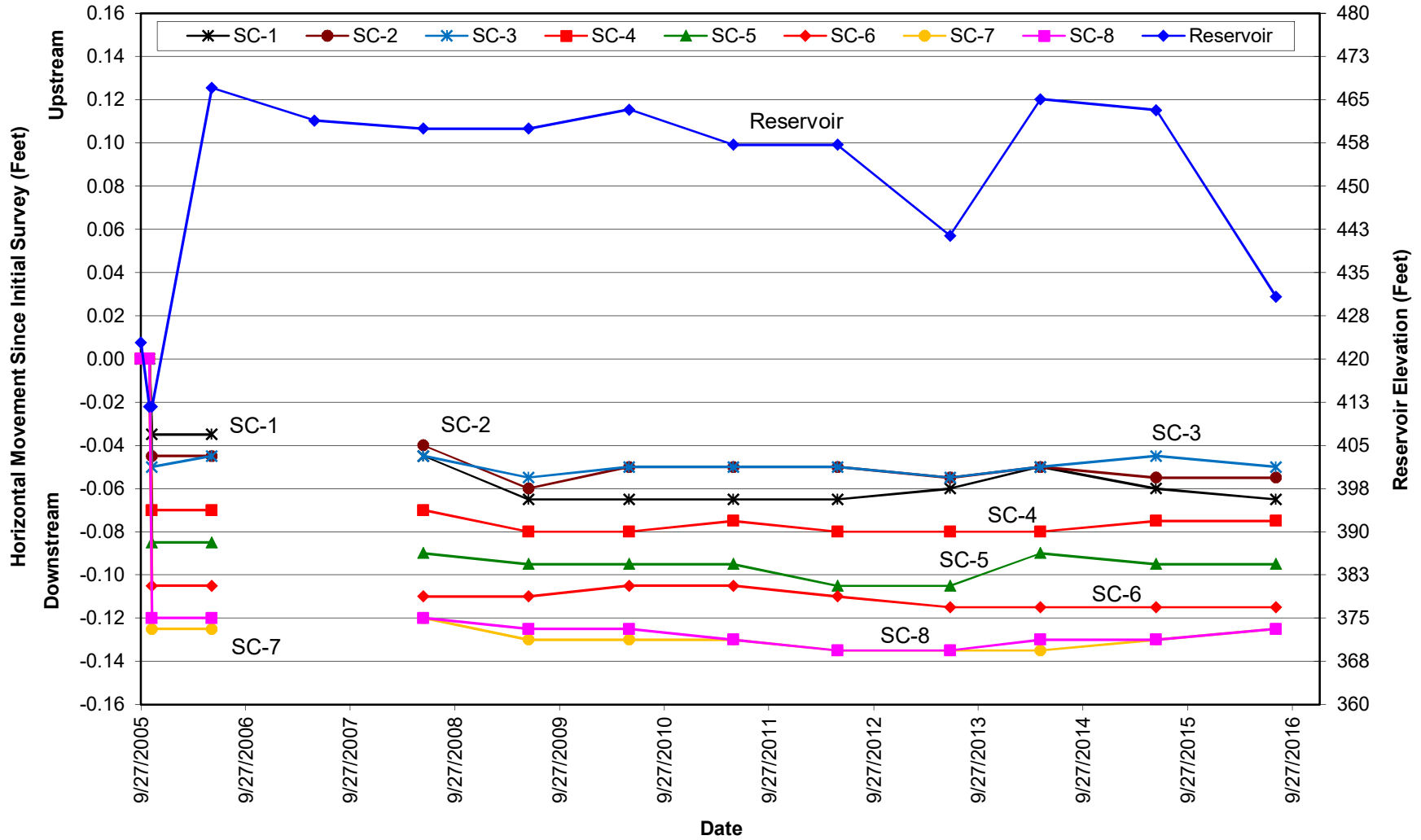
SAN JOAQUIN DAM HORIZONTAL MOVEMENT SURVEY MONUMENTS SA-1, SA-2, AND SA-3 2005 THROUGH 2016



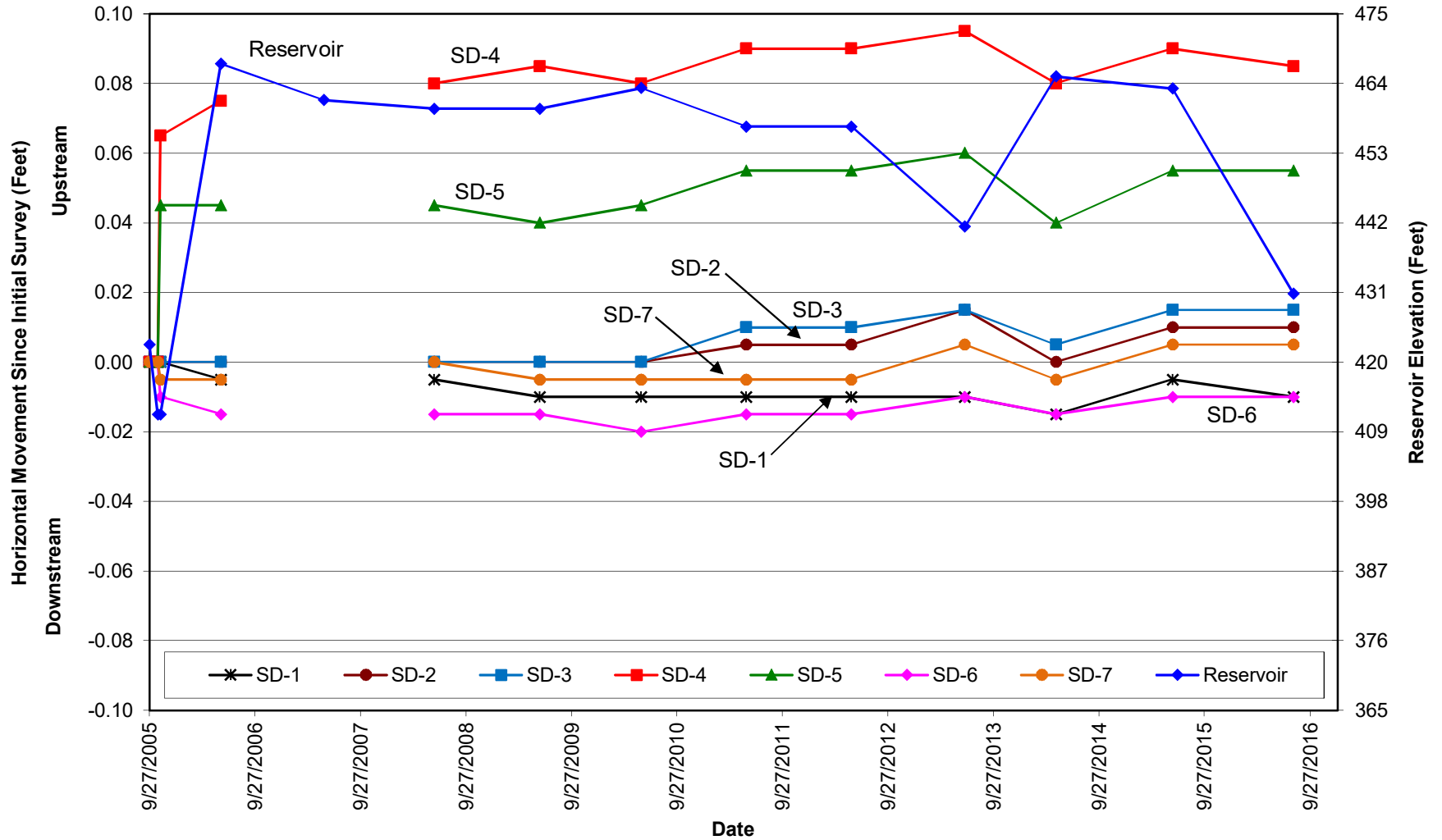
SAN JOAQUIN DAM HORIZONTAL MOVEMENT SURVEY MONUMENTS SB-1, SB-2, SB-3, SB-4, SB-5, SB-6, AND SB-7 2005 THROUGH 2016



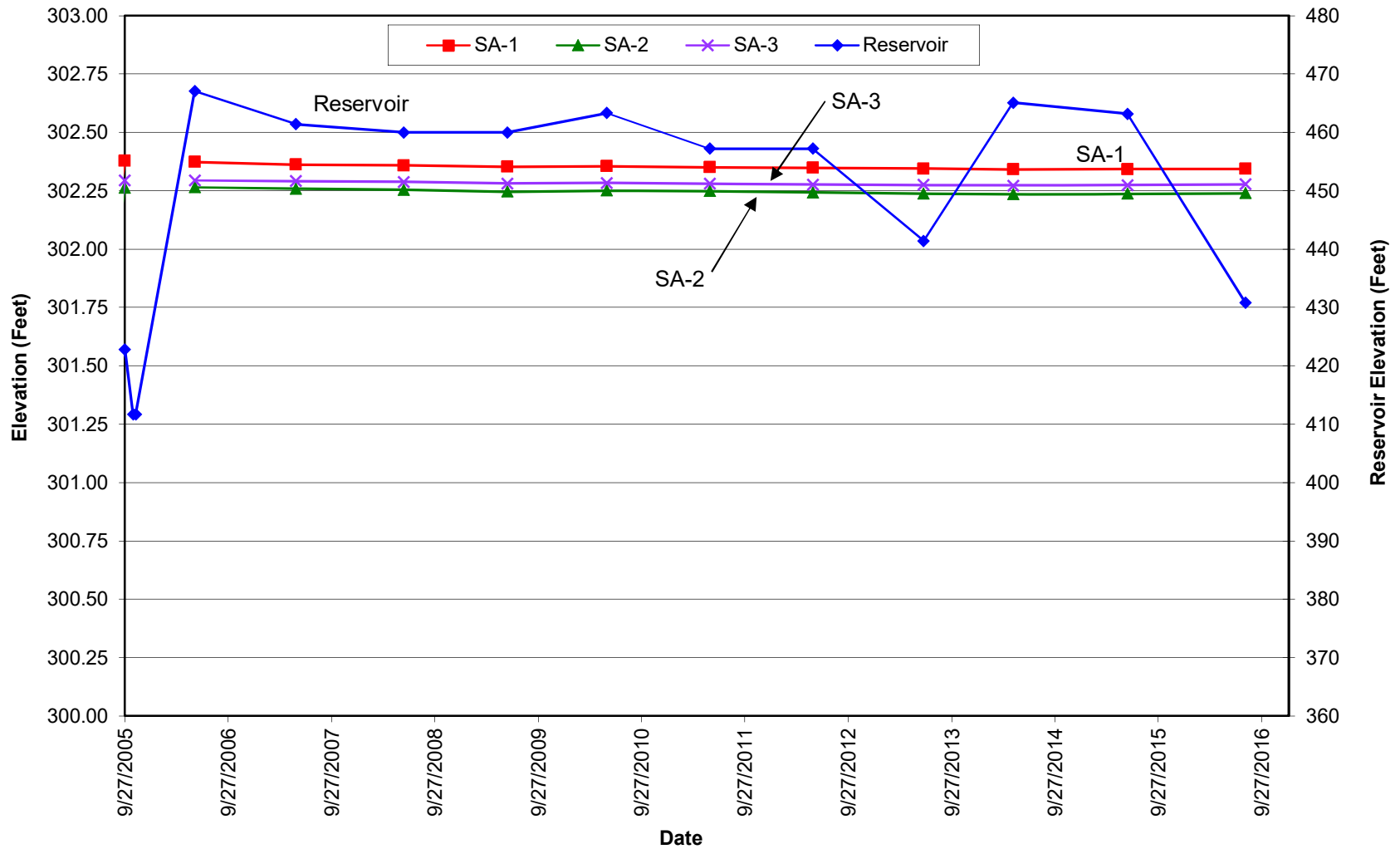
SAN JOAQUIN DAM HORIZONTAL MOVEMENT SURVEY MONUMENTS SC-1, SC-2, SC-3, SC-4, SC-5, SC-6, SC-7, AND SC-8 2005 THROUGH 2016



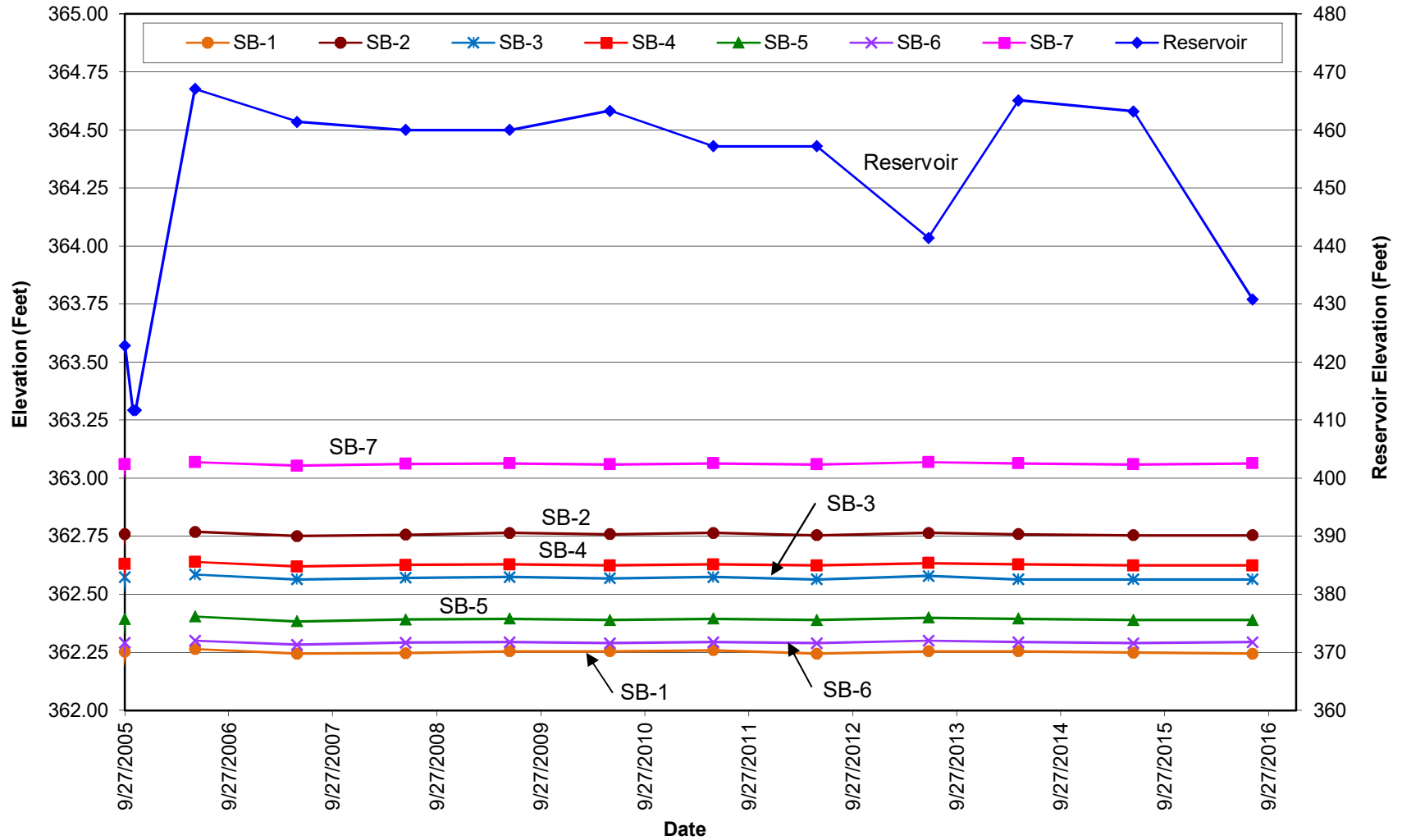
SAN JOAQUIN DAM HORIZONTAL MOVEMENT SURVEY MONUMENTS SD-1, SD-2, SD-3, SD-4, SD-5, SD-6, AND SD-7 2005 THROUGH 2016



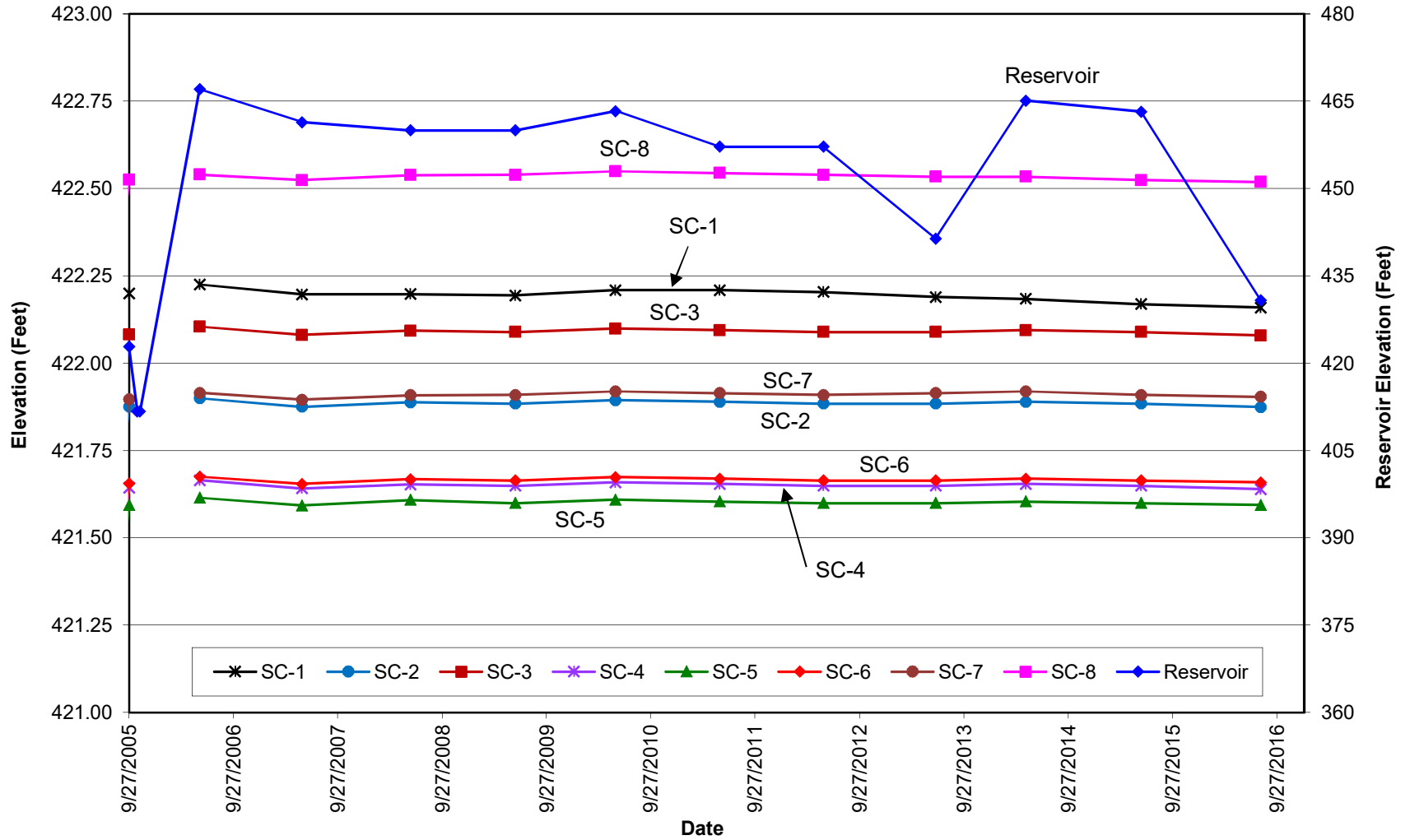
SAN JOAQUIN DAM VERTICAL MOVEMENT SURVEY MONUMENTS SA-1, SA-2, AND SA-3 2005 THROUGH 2016



SAN JOAQUIN DAM VERTICAL MOVEMENT SURVEY MONUMENTS SB-1, SB-2, SB-3, SB-4, SB-5, SB-6, AND SB-7 2005 THROUGH 2016



SAN JOAQUIN DAM VERTICAL MOVEMENT SURVEY MONUMENTS SC-1, SC-2, SC-3, SC-4, SC-5, SC-6, SC-7, AND SC-8 2005 THROUGH 2016



SAN JOAQUIN DAM VERTICAL MOVEMENT SURVEY MONUMENTS SD-1, SD-2, SD-3, SD-4, SD-5, SD-6, AND SD-7 2005 THROUGH 2016

