MONTEREY COUNTY WATER RESOURCES AGENCY
BOARD OF DIRECTORS
RESERVOIR OPERATIONS COMMITTEE

COMMITTEE MEMBERS

David Hart, Chair
Ken Ekelund
Richard Ortiz
Mark Nielsen
David Pozzi
Mark Gonzalez

John Baillie
Benny Jefferson
Dean Benedix
Richard Riddle (Parks)
Mark Sandoval (CalParks)

TIME: 1:30 pm
DATE: Thursday November 6, 2014
PLACE: Monterey County Water Resources Agency
Board Room
893 Blanco Circle
Salinas, CA 93901

AGENDA

1. **CALL TO ORDER**

2. **PUBLIC COMMENT**
(Limited to three (3) minutes per speaker on matters within the jurisdiction of the Agency not listed on this agenda. The public will have the opportunity to ask questions and make statements on agenda items as the Committee considers them.)

3. **APPROVE THE MINUTES OF THE RESERVOIR OPERATIONS COMMITTEE MEETING HELD ON OCTOBER 2, 2014**
The Committee will consider approval of the minutes of the above-mentioned meeting (Attachment 1).

4. **REVIEW THE STATUS OF BOTH RESERVOIRS; REVIEW RELEASES AND RELEASE SCHEDULE**
Staff will present a summary of current conditions at both reservoirs, as well as provide a synopsis of release changes that have occurred since the last meeting (Attachments 2, 2a, 3, 3a, 4). Staff will discuss reservoir inflow and inflow forecasts.

5. **RECEIVE REPORT ON TEMPERATURE SURVEY ON THE NACIMIENTO RIVER**
Staff will provide a report on temperature survey efforts this summer on the Nacimiento River below Nacimiento Dam (Attachment 5).

6. **RECEIVE REPORT ON WATER QUALITY SAMPLING AT SAN ANTONIO RESERVOIR**

Staff will provide a report on the results of water quality sampling at San Antonio Reservoir last month. The survey was undertaken to address Committee and BOD concerns of the potential for increased pathogen concentrations as a result of low water levels and increased wildlife presence at the reservoir (Attachment 6).

7. **RECEIVE REPORT ON CLOUD-SEEDING**

Staff will report on and discuss possible options for cloud-seeding opportunities.

8. **RECEIVE REPORT REGARDING OPERATIONS AND MAINTENANCE ACTIVITIES AT THE RESERVOIRS**

Brent Buche, Assistant General Manager / Chief of Operations and Maintenance will present a verbal report discussing the various Operations and Maintenance activities at both reservoirs that have occurred over the last month.

A. **OPERATIONS AND MAINTENANCE ACTIVITIES**
B. **NACIMIENTO HYDROELECTRIC PLANT** (Attachment 7)
C. **DAM SAFETY REPORT** (Attachments 8, 9, 10, 11)

9. **RECEIVE REPORTS ON STATUS OF:**

A. **LAKE RECREATION BY CONCESSIONAIRE & PARKS DEPARTMENT**
B. **EASEMENTS AND AGENCY LEASES**
C. **QUAGGA / ZEBRA MUSSEL PLAN**
D. **UPDATE ON SLO COUNTY ACTIVITIES**

10. **SET NEXT MEETING DATE AND DISCUSS FUTURE AGENDA ITEMS**

The Committee will discuss and determine details for its next meeting.

11. **ADJOURNMENT**

MONTEREY COUNTY WATER RESOURCES AGENCY
BOARD OF DIRECTORS
RESERVOIR OPERATIONS COMMITTEE

David Hart, Chair
Ken Ekelund
Richard Ortiz
Mark Nielsen
David Pozzi
Mark Gonzalez

John Baillie
Benny Jefferson
Dean Benedix
Richard Riddle (Parks)
Mark Sandoval (CalParks)

TIME: 1:30 p.m.
DATE: **Thursday, October 2, 2014**
PLACE: Monterey County Water Resources Agency
Board Room
893 Blanco Circle
Salinas, CA 93901
(831) 755-4860

MINUTES

1. **CALL TO ORDER @ 1:30 p.m. by Chair David Hart.**
Members present: David Hart, Ken Ekelund, Richard Ortiz, Mark Nielsen, David Pozzi, Mark Gonzalez, John Baillie, Benny Jefferson, Dean Benedix, Richard Riddle, Mark Sandoval

Members absent: None

A quorum was established.

2. **PUBLIC COMMENT**
John Baillie requested the Committee be provided regular reports/updates on Nacimiento Hydroelectric Powerplant activity and a list of maintenance items and costs.

3. **APPROVE THE MINUTES OF THE RESERVOIR OPERATIONS COMMITTEE MEETING HELD ON SEPTEMBER 4, 2014**
Committee Action: On motion and second of Committee members Richard Ortiz and John Baillie, the Committee unanimously approved the minutes.

4. **REVIEW THE STATUS OF BOTH RESERVOIRS; REVIEW RELEASES AND RELEASE SCHEDULE**
Jason Demers, Hydrologist, provided a status report. The USGS gage has recorded approximately 34 cfs in the Salinas River near Bradley.

NACIMIENTO elevation is 717.40 feet and 63,650 acre-feet of storage, 17% of capacity, and current release is 30 cfs.

SAN ANTONIO elevation is 649.45 feet and 12,241 acre-feet of storage, 4% of capacity, and current release is 5 cfs.

5. **RECEIVE REPORT ON TEMPERATURE AND SNORKEL SURVEYS ON THE ARROYO SECO AND NACIMIENTO RIVERS**

Clayton Leal, Water Resources Biologist, provided a report on this item. Upon reducing releases at Nacimiento Reservoir from 60 cfs to 30 cfs, the Agency implemented monitoring recommendations provided by National Marine Fisheries Services (NMFS). There was concern from NMFS related to potential increase in water temperature as a result of decreases in minimum releases from the reservoir, which could potentially impact steelhead habitat in the Nacimiento River.

NMFS recommended water temperature monitoring at multiple sites throughout the Nacimiento River, as well as an assessment of the current fish population for presence/absence. The Agency installed recording temperature monitors at five locations in the river, located approximately 1.5 miles apart, sited to evaluate how reduced flows may impact various habitat types. Data has been collected and reported to NMFS on a monthly basis, so far with a favorable response from NMFS. Agency Staff believe we have passed through the warmest months of the summer season and the last data evaluation is beginning to show a declining trend in water temperatures, which is expected this time of year.

Most data collected on steelhead habitat is done on the larger rivers of Northern California. Here in our area we are concerned with the South Central CA Coast Steelhead population, and very few temperature studies have has been performed related to this species. Recent studies done on Southern CA Steelhead populations report that steelhead can tolerate water temperatures as high as 30.1 degrees Celsius. Our monitoring has shown that we were below this temperature a majority of the season.

In addition to temperature monitoring, Agency staff snorkeled the Nacimiento River looking for fish. At approximately 7.5 miles downstream of the dam, trout were observed living in water of approximately 27 degrees. Greater amounts of fish were spotted at locations further upstream where water temperatures were cooler. Staff located approximately twenty-five individual steelhead, young of the year and adult fish, in the Nacimiento River during its most recent survey, indicating spawning is occurring in the Nacimiento River. Another survey is scheduled to be conducted this month. NMFS has been very pleased with the information provided by the Agency.

Index reach monitoring is required on the Arroyo Seco every summer. In the past we've used electro-fishing techniques to perform this survey. Our current permits do not allow us to perform this type of survey, so for the earlier Spring Season survey we used the snorkel survey method. This month, the four sites we historically use to perform the Fall Season survey were dry. Staff moved further upstream in hopes of finding flow, but results indicate that the Arroyo Seco is not currently flowing into NMFS designated critical habitat. Observations of isolated pools within the critical habitat did not result findings of steelhead.

6. **RECEIVE REPORT ON DIRECTION FROM MCWRA BOARD OF DIRECTORS (BOD) REGARDING WATER QUALITY SAMPLING AT SAN ANTONIO RESERVOIR**

Tamara Voss, Hydrologist, provided a report on water quality sampling at San Antonio reservoir. Staff responded to this committee's September request to seek guidance and direction regarding water quality sampling at San Antonio Reservoir from the Board of Directors. This request was because of the committee's concern of the potential for pathogens to exist as a result of low water levels and increased wildlife presence at the reservoir.

The Board directed Agency staff to further investigate sampling and to contact the Monterey County Environmental Health Bureau (EHB) to discuss with EHB responsibility for performing the sampling. Another question to explore was what actions would be necessary should sampling indicate a positive result for pathogens. Staff has been in communication with EHB and is waiting for a reply. Agency staff currently tests for cation, anion and major minerals at the reservoirs in May and September each year. Testing for pathogens would be an extension of that sampling.

Results from two water quality sampling events collected during the month of April 2014, prior to the Wildflower Triathlon, were discussed. The results of that testing confirmed that Fecal Coliform, E. coli, and enterococcus concentrations were all either non-detect or below reporting levels. Funding to perform this increased water quality sampling has not been identified.

Committee members requested the Agency provide links to San Luis Obispo County's water quality sampling programs at Nacimiento Reservoir.

7. **RECEIVE REPORT ON CLOUD-SEEDING**

There was no update available from Agency staff. Dean Benedix, San Luis Obispo County (SLO), provided a brief update. SLO is beginning its budget preparation process and will include a request for funds to support cloud-seeding. SLO has been in communication with Santa Barbara County to obtain information on the costs of cloud-seeding and resulting benefits. As per Committee's motion last month, Agency staff will be contacting the surrounding counties to seek interest in a cooperative cloud-seeding effort.

8. **RECEIVE REPORT REGARDING OPERATIONS AND MAINTENANCE ACTIVITIES AT THE RESERVOIRS**

Brent Buche, Assistant General Manager & Chief of Operations and Maintenance, provided an update on operations and maintenance activities at the reservoirs. Unit 2 at Nacimiento Reservoir is operating and generating power. A total of approximately 30 cfs is being released from the reservoir with approximately 20 - 25 cfs through Unit 2 and the remainder through the bypass valve. We're currently below the manufacturer's minimum recommended head for operation of Unit 2, and may soon be unable to continue its operation. Monitoring of the operation of Unit 2 is on a continual basis. The Committee requested reports on hydro plant operational efficiency and power generation be presented on a monthly basis. Brent discussed the status of our insurance claim of business

interruption resulting from last year's emergency repairs at Nacimiento. Other activities at both reservoirs include general maintenance that routinely occurs prior to winter. Additionally, as a result of this summer's DSOD inspection we are working on a list of approximately twelve items to address at Nacimiento. Brent relayed that several of the items listed have been completed. All items on the list must be completed before the Obermeyer can be raised this winter. Brent assured the committee that by the time rains begin this winter and the possibility of significant inflow is apparent, resources will be made available to complete all items on the list.

Routine maintenance is continuing at San Antonio in preparation for the winter. Repair work inside the tunnel cannot be started until the lake level reaches dead pool. A barge will be needed to make the repairs on the trash racks which are now planned for replacement.

9. RECEIVE REPORTS ON STATUS OF:

A. LAKE RECREATION BY CONCESSIONAIRE & PARKS DEPARTMENT

Mark Sandoval, CalParks, and Richard Riddle, Senior Park Ranger, provided a report. North Shore at San Antonio remains closed and South Shore will be undergoing a few repairs. Nacimiento recreational usage is holding steady. CalParks revenue for July was good with overall revenue for the summer at about 50% of normal.

B. EASEMENTS AND AGENCY LEASES

Chris Keehn, Right-Of-Way Specialist, provided an update to the Committee. As was reported to this Committee last month, illegal hunting occurred on Lease 3 at Nacimiento. The Agency has been contacted by Fish & Game about moving forward on proceedings to prosecute the violator. Over the years there has been an increase in traffic and trespassing in this area. Staff is aware of the need to develop solutions to the problem.

There was a discussion of local property right of way and easement issues, and owner access granted in deeds. Staff requested Committee members' share any information they are willing to share with the Agency on deed grants that grant easement and provide access to the water.

The Committee asked if there was an update on the fiber-optic installation along Tank Road at Nacimiento. Staff stated they have not yet received a reply from Fort Hunter Liggett.

C. QUAGGA / ZEBRA MUSSEL PLAN

There was nothing to report by Agency staff.

D. UPDATE ON SLO COUNTY ACTIVITIES

Dean Benedix, San Luis Obispo County, provided an update. As reported to this Committee last month, leaks were detected in the Nacimiento Water Project (NWP) pipeline. Six leaks have been identified in a 90-foot deep crossing under the Nacimiento River. No water deliveries will be made until repair is completed. SLO County Board of Supervisors gave approval for repairs. Construction is scheduled to begin January 2015. NWP water delivery is scheduled to begin April 2015.

10. SET NEXT MEETING DATE AND DISCUSS FUTURE AGENDA ITEMS

The next meeting is scheduled for Thursday November 6, 2014. Agenda items will include an update on Nacimiento Hydroelectric Powerplant activities, and O&M work at the reservoirs/flow sheet on repairs.

11. ADJOURNMENT BY CHAIR DAVID HART @ 2:43 P.M.

SUBMITTED BY: TERESA CAMPA

MONTEREY COUNTY WATER RESOURCES AGENCY
BOARD OF DIRECTORS - RESERVOIR OPERATIONS COMMITTEE

MEETING DATE:	November 6, 2014		**AGENDA ITEM:**
AGENDA TITLE:	Reservoir Release Update		
	Consent ( ) **Action ( )** **Information (X)**		
SUBMITTED BY: **PHONE:**	Howard Franklin (831) 755-4860	**PREPARED BY:** **PHONE:**	Howard Franklin (831) 755-4860
DEADLINE FOR BOARD ACTION:		November 6, 2014	

RECOMMENDED BOARD ACTION:

None – item presented for informational purposes.

SUMMARY:

The Board of Directors receives monthly updates on the status of Agency reservoirs.

DISCUSSION/ANALYSIS:

RESERVOIR ELEVATION / STORAGE: The following reservoir conditions were recorded on October 29, 2014. San Antonio Reservoir is at an elevation of approximately 648.55 feet mean sea level (msl), 11,838 acre-feet of storage. Nacimiento Reservoir is at elevation 715.9 feet msl, 60,950 acre-feet of storage. San Antonio Reservoir is at 4% of storage capacity and Nacimiento Reservoir is at 16% of capacity.

RESERVOIR RELEASES: As directed by the Agency Board of Directors and in coordination with guidelines provided by the National Marine Fisheries Service; releases from Nacimiento were incrementally decreased to a target flow rate of 25 cfs. Releases from San Antonio Reservoir remain at 5 cfs.

Releases as of October 29, 2014:

- Nacimiento Reservoir: 37 cfs
- San Antonio Reservoir: 5 cfs

Total releases from both reservoirs to the Salinas River are approximately 42 cfs. The following "provisional" flows have been recorded by the USGS:

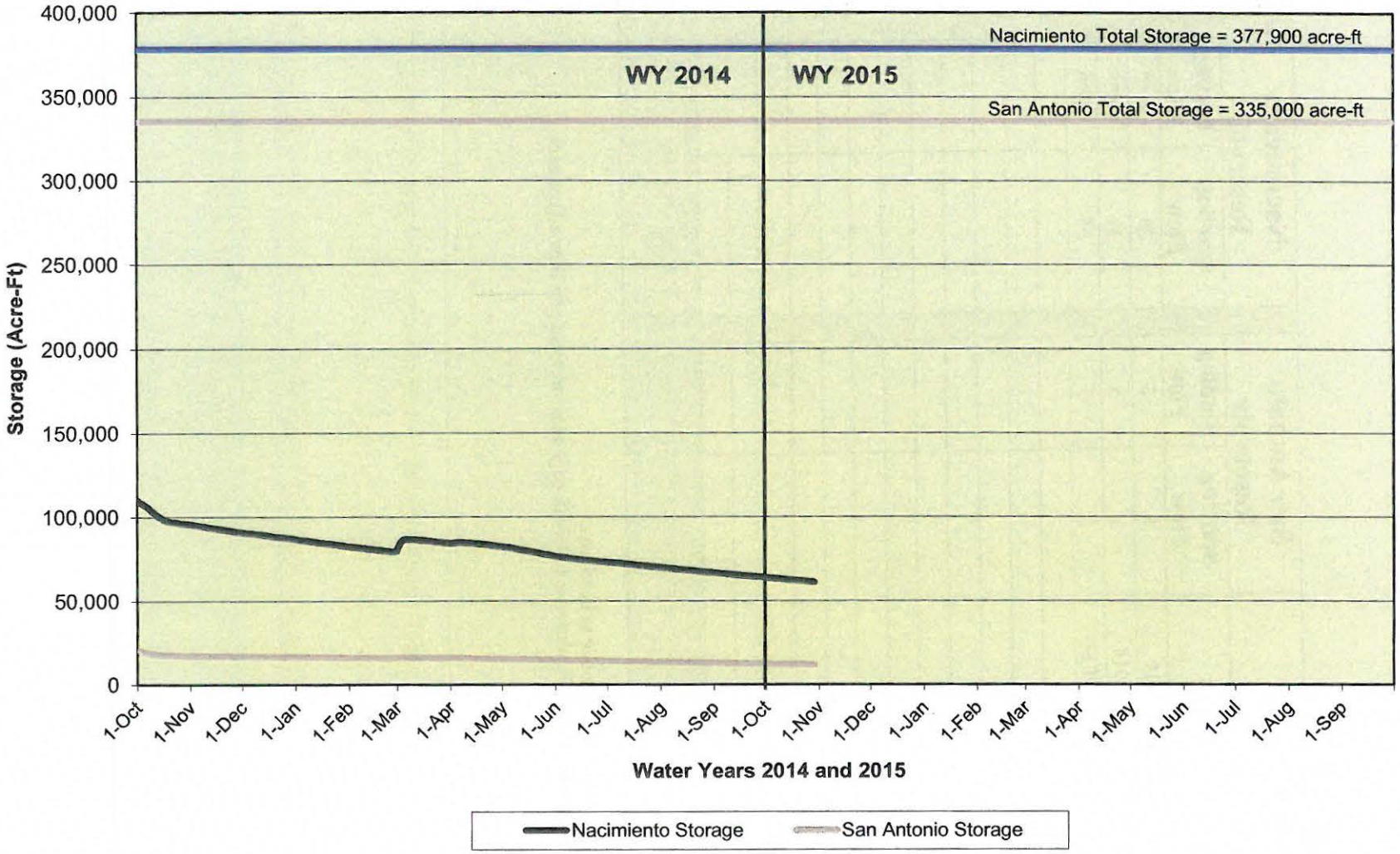
- Salinas River near Spreckels: 0 cfs
- Salinas River near Chualar: 0 cfs
- Salinas River near Soledad: 0 cfs
- Salinas River near Bradley: 30 cfs (steady)

Synopsis of Reservoir Release Changes from
July 3, 2014 to October 29, 2014

	San Antonio Reservoir		Nacimiento Reservoir		
Date	Starting Flow	Ending Flow	Starting Flow	Ending Flow	Total Releases
July 3, 2014	5	5	26	31**	36
August 2, 2014	5	5	31	26**	31
August 30, 2014	5	5	26	30**	35

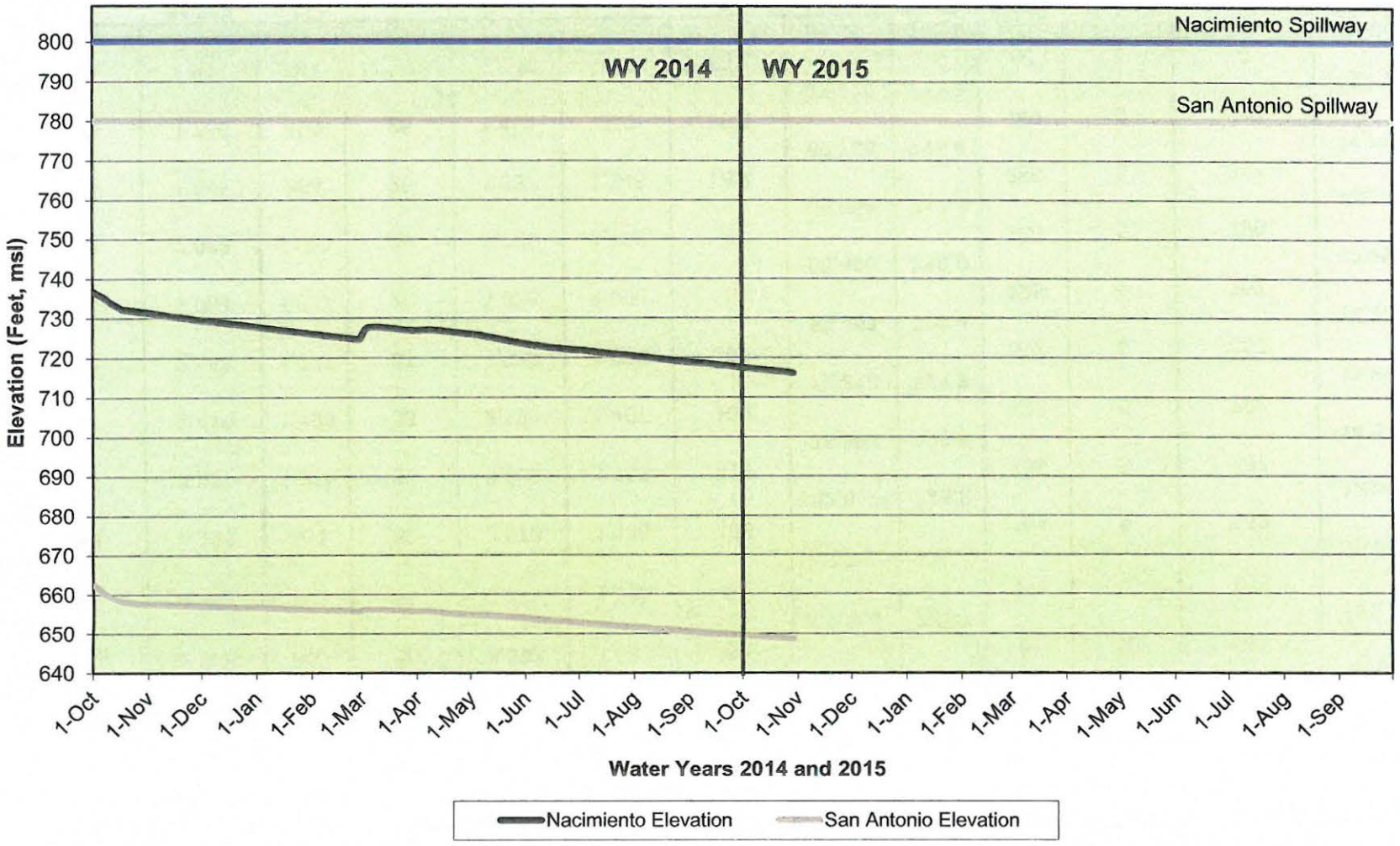
*Release reduction due to head loss.
**Release change in response to USGS gage measurement and flow adjustment.

Reservoir Storage



ATTACHMENT 3

Reservoir Elevation



ATTACHMENT 3a

MONTEREY COUNTY WATER RESOURCES AGENCY

PRELIMINARY - Estimated Elevation/Storage/NWP Diversions after October 1st

10/29/2014

RESERVOIR RELEASE SCHEDULE FOR 2014

			NACIMIENTO							SAN ANTONIO				
	Combined Releases (cfs)*	Combined Releases (ac-ft)	Evap. Losses (ac-ft)**	Reservoir Releases (cfs)*	Reservoir Releases (ac-ft)	NWP Orders (ac-ft)	NWP Diversions (ac-ft)	Storage (ac-ft)	Elev. (ft)	Evap. Losses (ac-ft)**	Reservoir Releases (cfs)*	Reservoir Releases (ac-ft)	Storage (ac-ft)	Elev. (ft)
1/1/2014								**86,393**	**727.7**				**16,390**	**656.6**
	70	4,304	237	60	3,689	755	123			68	10	615		
2/1/2014								**82,165**	**725.9**				**15,935**	**655.9**
	70	3,888	300	60	3,332	1,037	86			87	10	555		
3/1/2014								**81,695**	**725.7**				**15,935**	**655.9**
	71	4,346	563	61	3,731	1,033	91			151	10	615		
4/1/2014								**84,200**	**726.8**				**15,675**	**655.5**
	69	4,128	561	60	3,570	1,133	106			154	9	558		
5/1/2014								**82,012**	**725.8**				**15,042**	**654.5**
	65	3,997	1,215	60	3,689	1,165	819			135	5	307		
6/1/2014								**76,288**	**723.5**				**14,600**	**653.8**
	41	2,418	1,198	36	2,120	1,707	100			422	5	298		
7/1/2014								**72,870**	**721.8**				**13,880**	**652.6**
	36	2,188	1,237	31	1,880	1,907	0			302	5	307		
8/1/2014								**69,753**	**720.4**				**13,271**	**651.5**
	31	1,934	1,637	26	1,626	1,966	0			295	5	307		
9/1/2014								**66,490**	**718.8**				**12,669**	**650.3**
	30	2,083	1,055	30	1,785	1,758	0			130	5	298		
10/1/2014								**63,650**	**717.4**				**12,241**	**649.4**
	30	1,845	864	25	1,537	1,243	TBR			285	5	307		
11/1/2014								**60,760**	**715.9**				**11,775**	**648.5**
	30	1,785	420	25	1,488	953	TBR			149	5	298		
12/1/2014								**57,899**	**714.4**				**11,328**	**647.6**
	30	1,845	264	25	1,537	744	TBR			90	5	307		
1/1/2015								**55,354**	**713.0**				**10,000**	**645.0**
TOTALS:		**34,759**	**9,550**		**29,986**	**15,403**	**1,325**			**2,268**		**4,772**		

* Mean daily flow for the month in cubic feet per second.

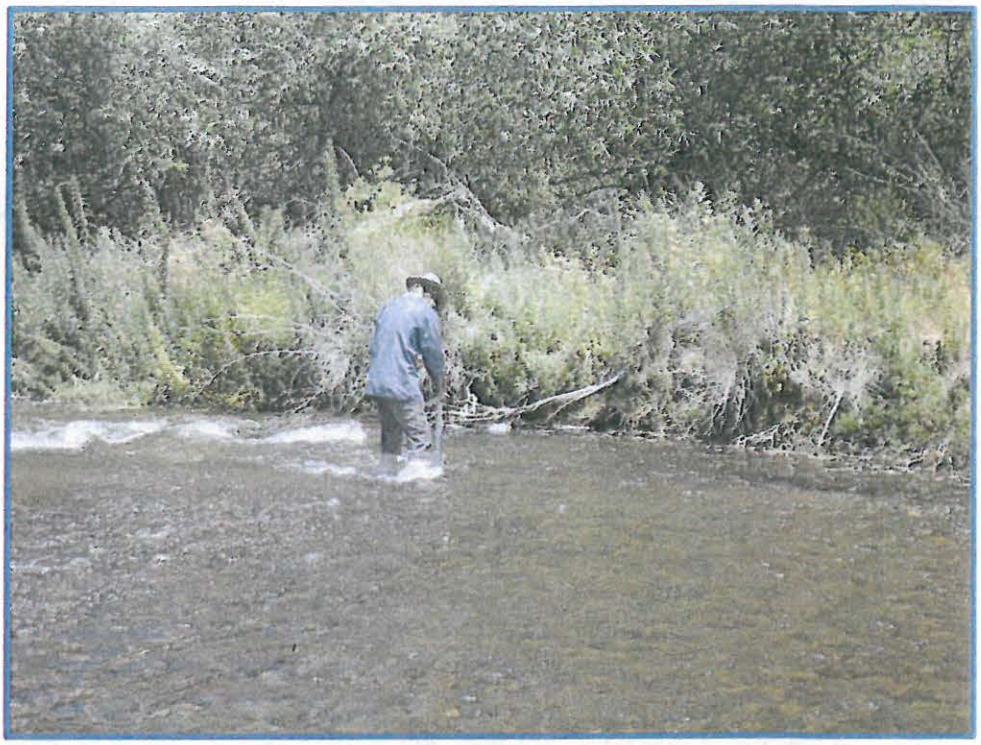
** Evap. Losses estimated from long term pan evaporation data at Nacimiento and San Antonio Reservoirs.

NOTES:

1. Nacimiento Reservoir storage capacity 377,900 acre feet.
2. San Antonio Reservoir storage capacity 335,000 acre feet.
3. Reservoir Operations Committee may make release considerations for fish spawn and holiday periods to benefit recreation.
4. Shaded areas represent periods when elevations are influenced by inflow/runoff; releases may include flood control releases.
5. Preliminary Schedule assumes no inflow to reservoirs after May 1st.
6. "NWP Diversions" are San Luis Obispo County - Nacimiento Water Project conveyance facilities diversions. Max. allowable diversions for water year (Oct. 1 - Sept. 30) are 15,750 ac-ft. To Be Reported (TBR)
7. Nacimiento "NWP Diversions" do not include lakeside water use which is estimated at approximately 1,750 acre feet per year.

ATTACHMENT 4

Nacimiento River Flow Reduction
Temperature Monitoring

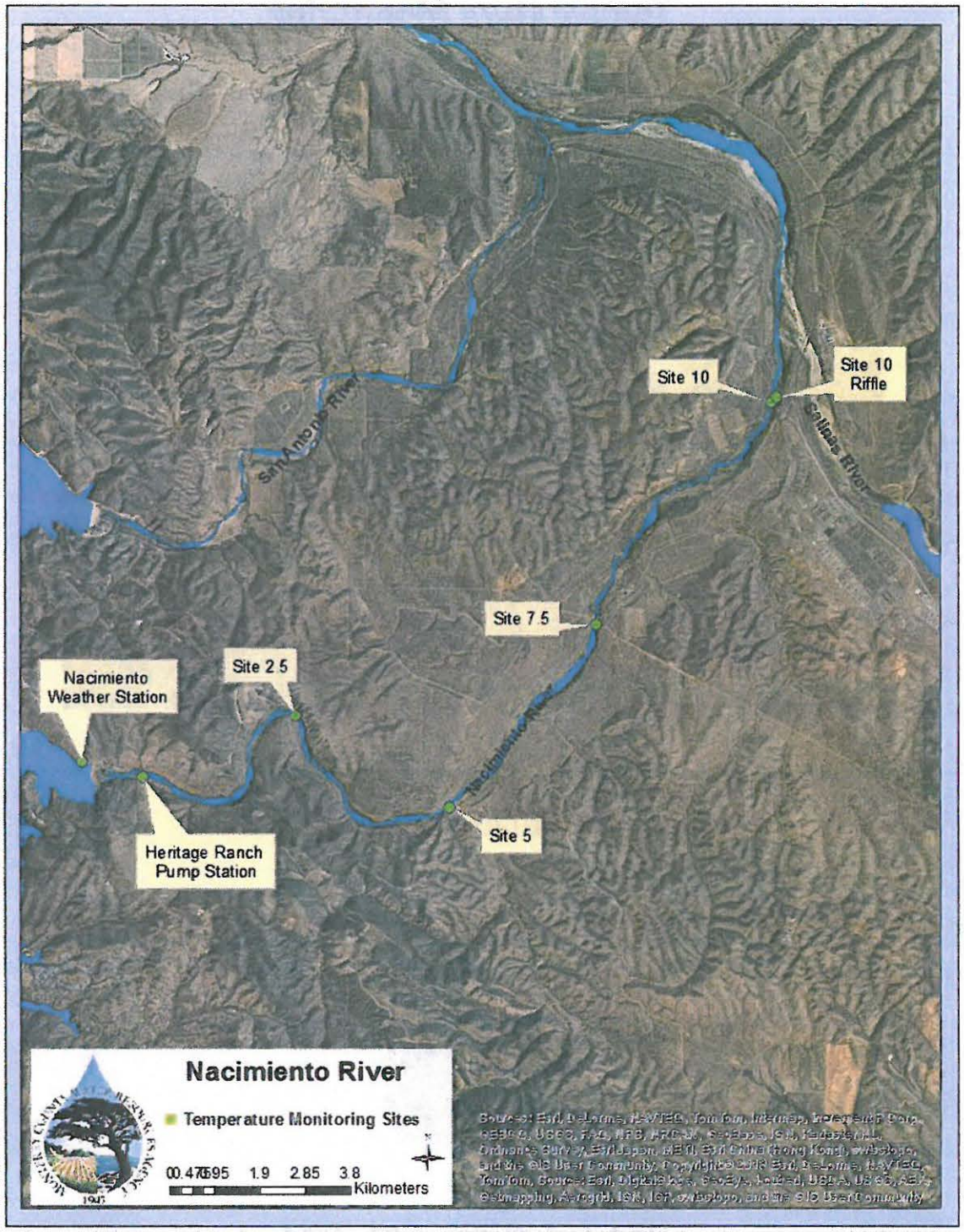


Monterey County Water Resources Agency
890 Blanco Circle
Salinas, CA 93902

Updated: October 27, 2014

ATTACHMENT 5

Temperature Monitoring Map



This map indicates the temperature monitoring locations established on the Nacimiento River to monitor temperature during the 2014 drought flow reduction. Site descriptions, habitat characteristics, and temperature data is presented in the text below.

Site 2.5

Location: 35°46'5.76"N 120°50'48.90"W

Site Description: The temperature logger is located approximately 4.46 km (2.77 miles) downstream of the Nacimiento Dam outlet. The monitoring location is located approximately 44 m downstream of the abandoned bridge that connects Perimeter Road and River Road over the Nacimiento River (Figures 1 and 2). The instrument is staked to the left bank at the first riffle downstream of the abandoned bridge. The instrument is positioned in the thalweg of a riffle approximately 2 m downstream of the crest.

Figure 1: Site 2.5 aerial image.

Figure 2: Site 2.5 at 28 cfs.

Habitat Description: The logger is located in a riffle descending from a large pool. The upstream pool is over 80 m in length and has depths that exceed 1.5 m. The logger is in a riffle that spans the entire width of the channel. The thalweg of the channel is located along the left bank (Figure 3). Depth is less than 20 cm for over 50 percent of the channel. At the time of deployment it was sitting on the substrate in

water with an approximate depth of 56 cm. The riffle is less than 10 m in total length, and then joins a short run that spills into another large pool. The canopy cover above the logger is sparse (Figure 4) and majority of the channel upstream of the site is exposed to direct sunlight.

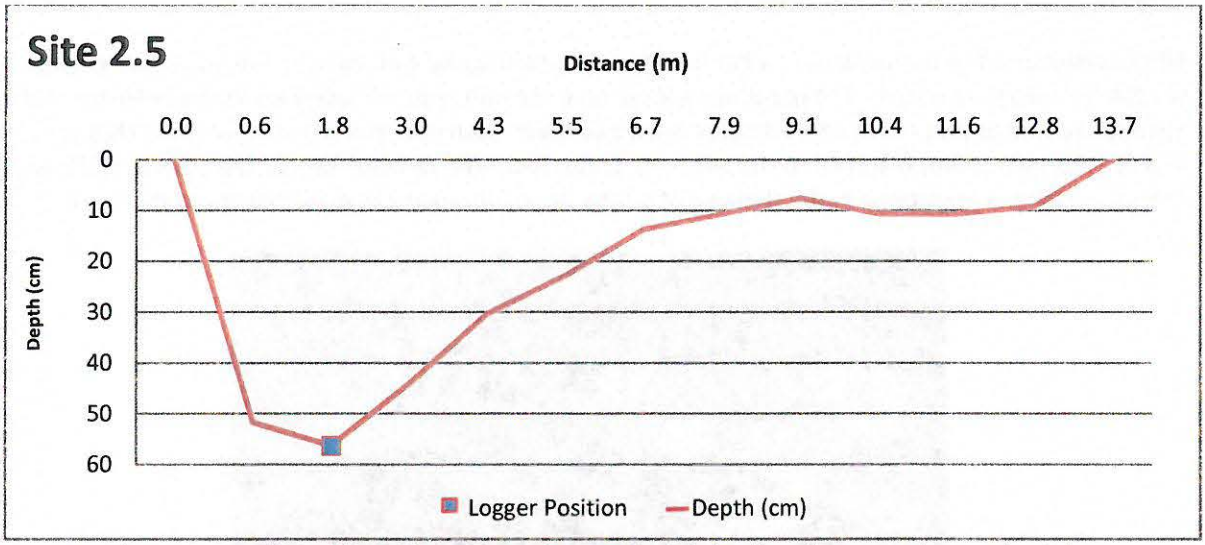


Figure 3: Depth Profile at Site 2.5 starting on the left bank and progressing to the right.

SWAMP Optical Habitat Evaluation (Ode, 2007)

Algae	Very Heavy	**Boulders**	Absent	**Undercuts**	Moderate	**Rootwads**	Absent	**Primary Substrate**	Cobble
Emergent Vegetation	Moderate	**Woody Debris**	Absent	**Overhanging Vegetation**	Sparse	**Artificial Structures**	Absent	**Secondary Substrate**	Gravel

Figure 4: Surface Water Ambient Monitoring Program optical assessment of habitat conditions.

Directions to Site: Enter Camp Roberts through A Street. Take the left fork to California Blvd. Continue down California Blvd and bear right onto Nacimiento Road. Nacimiento Road turns into Perimeter Road near the Range Control Office. Go past Range Control and turn right onto Bee Rock Road and take the bridge over the Nacimiento River. At the Y turn left onto Tower Road. Follow Tower Road through the eagle nesting area, past Avery Road. 1.32 miles past Avery Road, turn left onto unmarked, River Road. Follow River Road for 1.86 miles paralleling the River in a westerly direction. At the 1.86 mile mark there is an unmaintained spur road that leads to the River. The spur road ends at the River. The logger is upstream of the road, but downstream of the abandoned bridge (see the Site Description).

Temperature Data: The water temperature provided below is based on daily mean, minimum, and maximum degrees Celsius, generated from hourly temperature recording from a Hobo U-22 data logger. Flow is provided in daily average cubic feet per second (cfs) generated from quarter hour preliminary data collected at the USGS 11149400 Nacimiento River below Nacimiento dam near Bradley, CA stream flow gage. Temperature is provided in daily average from the MCWRA weather station located near Nacimiento Dam approximately 3.75 km west of Site 2.5. The averages were generated from hourly data in Celsius.

The Hobo U-22 temperature logger was deployed at Site 2.5 on June 5, 2014. Data was collected continuously with downloads occurring on June 17 and 24, July 9 and 25, August 20, September 24, and October 23. The data represented in Figure 5 includes June 5, 2014 to October 22, 2014. The USGS adjusted preliminary (as of October 27, 2014) flow data based upon field measurements, therefore, they will not match data that was provided in the June, July, August, and September monitoring reports. The correction does not significantly alter the hydrograph.

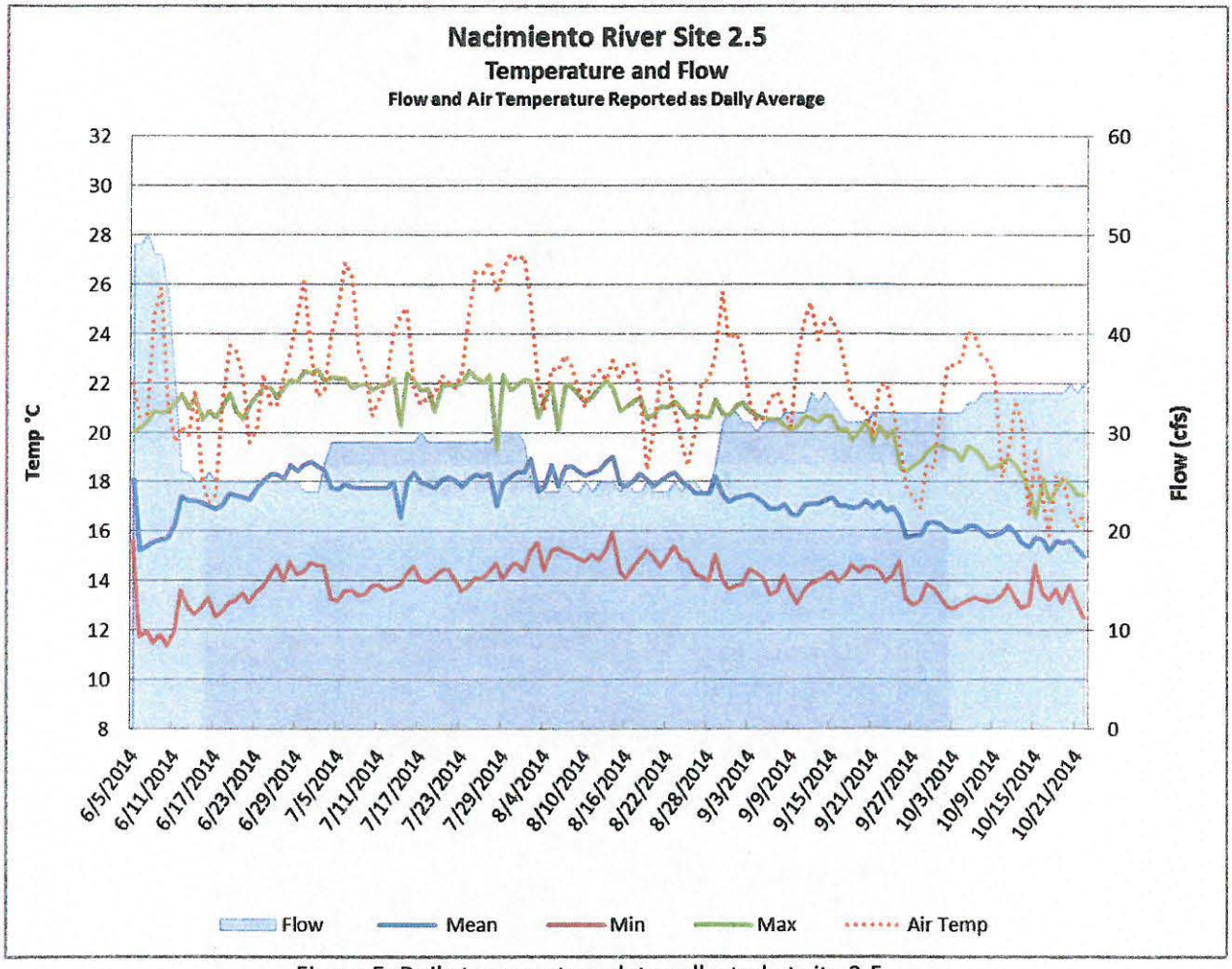


Figure 5: Daily temperature data collected at site 2.5

Site 5

Location: 35°45'15.68"N 120°49'5.21"W

Site Description: The temperature logger is located approximately 8.24 km (5.1 miles) downstream of the Nacimiento Dam outlet. The monitoring location is located is in an expansive reach best classified as a glide, as it lacks depth to meet pool status (Figure 6 and 7). The instrument is staked to the right bank 10 m downstream of a power-line crossing. The cable extends towards the water between two scrub willows with branches that extend into the water. A cluster of three sycamore trees (20 cm DBH) are a good indicator of relative location if power-lines are ever removed. The cabling point is upstream of the three tree cluster. The instrument is positioned in the thalweg of the channel within 2 m of the bank.

Figure 6: Site 5 aerial image.

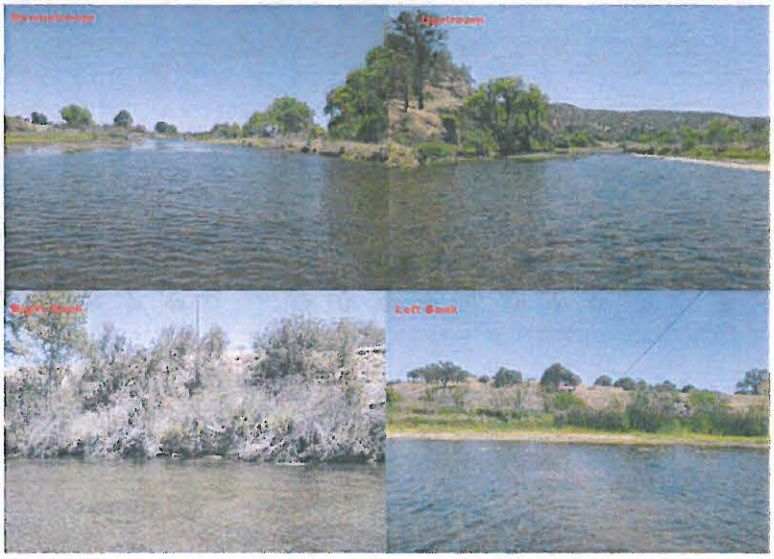


Figure 7: Site 5 at 28 cfs.

Habitat Description: The logger is located in a habitat best classified as a glide. The habitat up and downstream is uniform, wide, with a right bank dominated thalweg. Areas along the left bank are shallow and have limited canopy cover, and the maximum depth along the right bank (thalweg) is approximately 45 cm (Figure 8). The canopy cover above the logger is sparse, and majority of the channel upstream of the site is exposed to direct sunlight. The reach has a high potential for thermal increase. The habitat is not beneficial to *O. mykiss* (figure 9) as it lacks complexities and has a substrate made primarily of sand with a secondary of silt and mud.

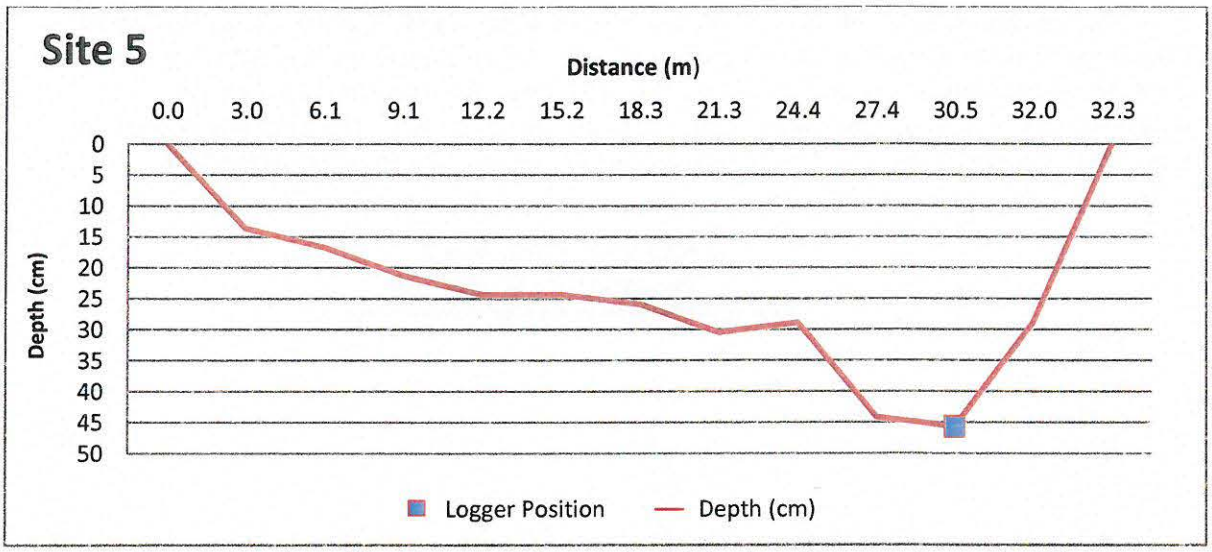


Figure 8: Depth profile at Site 5 starting on the left bank and progressing to the right.

SWAMP Optical Habitat Evaluation (Ode, 2007)

Algae	Heavy	**Boulders**	Absent	**Undercuts**	Moderate	**Rootwads**	Sparse	**Primary Substrate**	Sand
Emergent Vegetation	Moderate	**Woody Debris**	Absent	**Overhanging Vegetation**	Sparse	**Artificial Structures**	Absent	**Secondary Substrate**	Silt/Mud

Figure 9: Surface Water Ambient Monitoring Program optical assessment of habitat conditions.

Directions to Site: Enter Camp Roberts through A Street. Take the left fork to California Blvd. Continue down California Blvd and bear right onto Nacimiento Road. Nacimiento Road turns into Perimeter Road near the Range Control Office. Go past Range Control and turn right onto Bee Rock Road and take the bridge over the Nacimiento River. At the Y turn left onto Tower Road. Follow Tower Road for 2.2 miles through the eagle nesting area, past Avery Road, and turn left onto an unmarked dirt road that heads towards the river. At the time of deployment the area was marked with signs that read environmentally sensitive area. Follow the dirt road down to the water's edge and follow the road upstream parking on the downstream side of the power-lines (figure 2).

Temperature Data: The water temperature provided below is based on daily mean, minimum, and maximum degrees Celsius, generated from hourly temperature recording from a Hobo U-22 data logger. Flow is provided in daily average cubic feet per second (cfs) generated from quarter hour preliminary data collected at the USGS 11149400 Nacimiento River below Nacimiento dam near Bradley, CA stream flow gage. Temperature is provided in daily average from the MCWRA weather station located near Nacimiento Dam approximately 6.36 km west of Site 5. The averages were generated from hourly data in Celsius.

The Hobo U-22 temperature logger deployed to satisfy the Biological Opinion was downloaded. Data was collected continuously with downloads occurring on June 17 and 24, July 9 and 25, August 20, September 24, and October 23. The data represented in Figure 10 includes June 5, 2014 to October 22, 2014. The USGS adjusted preliminary (as of October 27, 2014) flow data based upon field measurements, therefore, they will not match data that was provided in the June, July, August, and September monitoring reports. The correction does not significantly alter the hydrograph.

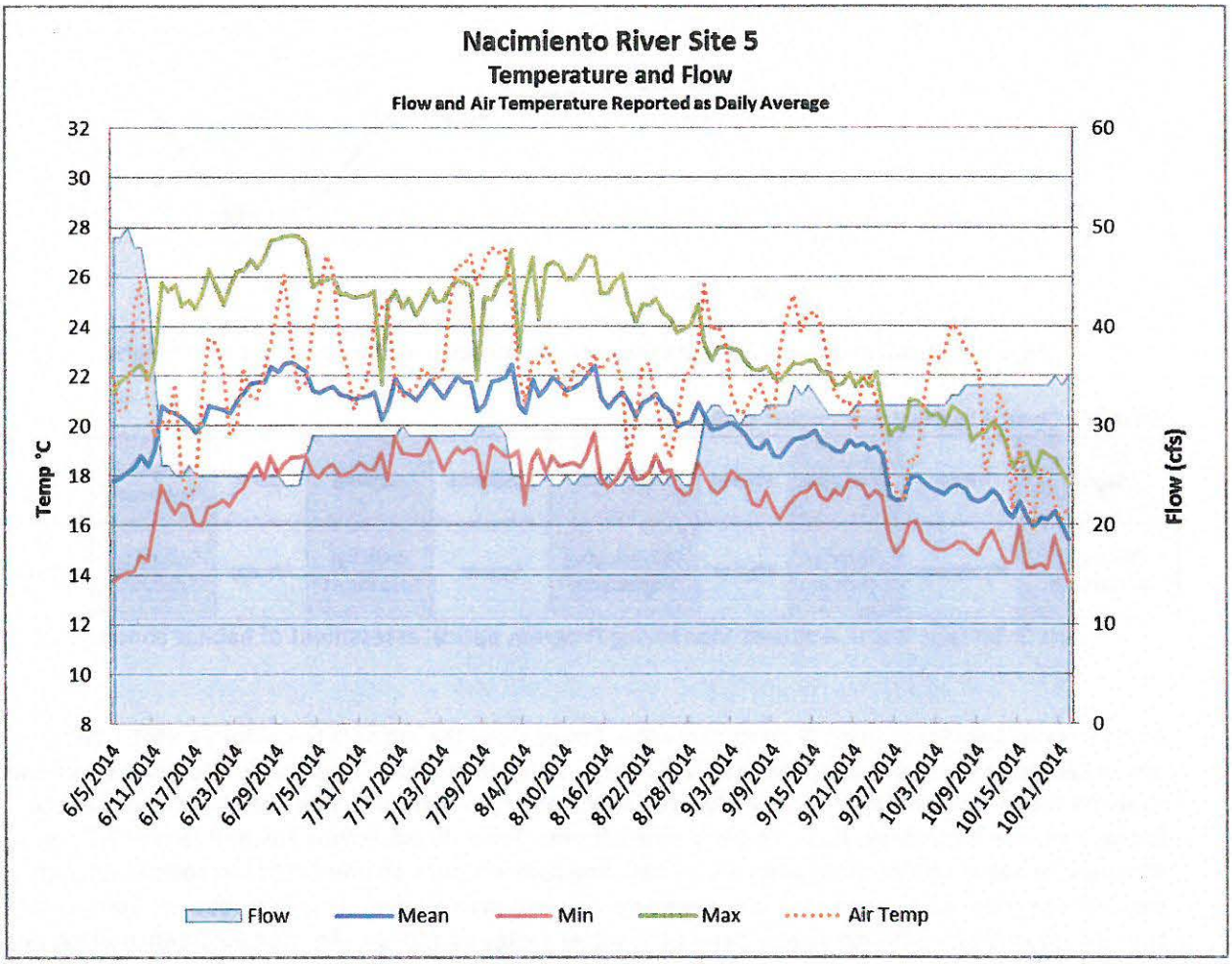


Figure 10: Daily temperature data collected at site 5.

Site 7.5

Location: 35°46'56.11"N 120°47'26.74"W

Site Description: The temperature logger is located approximately 12.5 km (7.74 miles) downstream of the Nacimiento Dam outlet. The monitoring station is located in a riffle habitat upstream of the Bee Rock Road Bridge crossing (Figure 11 and 12). The riffle is first riffle 100 m upstream of the bridge and is located downstream of the point where the river makes a slight bend and enters a pool. The instrument is cabled to roots along the right bank and extends to the thalweg of the channel. The riffle structure along the right bank consists of large concrete scraps placed in the channel.

Figure 11: Site 7.5 aerial image.

Figure 12: Site 7.5 at 28 cfs.

Habitat Description: The logger is located in a riffle habitat. It is an area of high surface turbulence downstream of the shallow riffle crest. The riffle is located on a slight meander with a right bank dominated thalweg. The maximum depth is approximately 40 cm (Figure 13). The habitat upstream consists of a shallow riffle flowing from a pool habitat. The pool has limited velocity, but has more overhanging vegetation than other reaches. Downstream, the riffle flows into a run that passes through three large culverts under the Bee Rock Road Bridge. At the logger site, overhanging vegetation is sparse, but submerged roots and artificial structures in the form of concrete scraps create potential beneficial habitat for *O. mykiss* (figure 14).

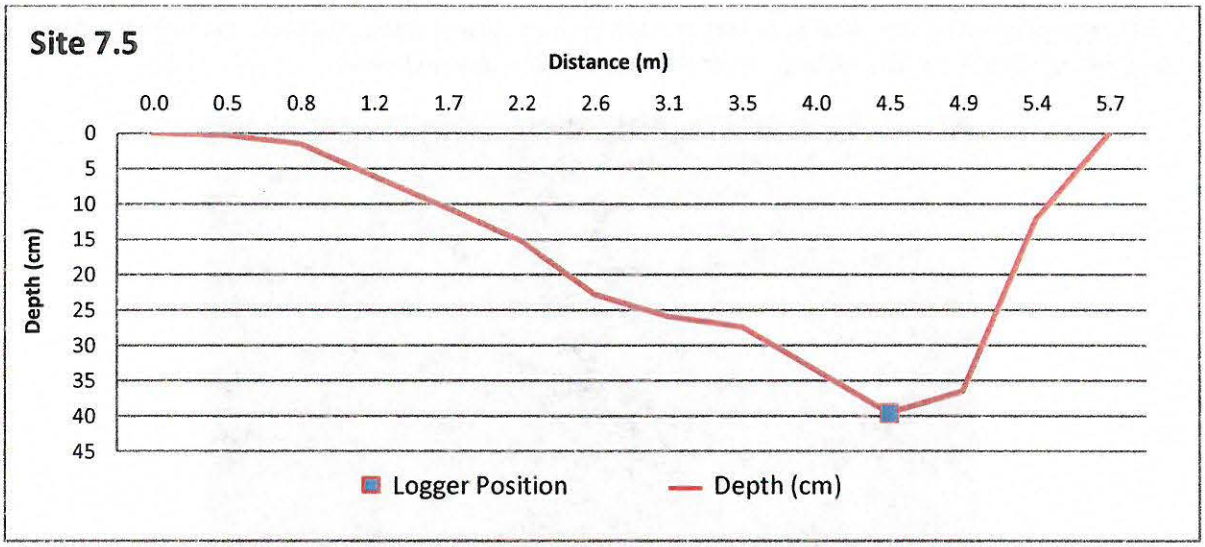


Figure 13: Site 7.5 depth profile starting on the left bank and progressing towards the right.

SWAMP Optical Habitat Evaluation (Ode, 2007)

Algae	Moderate	**Boulders**	Absent	**Undercuts**	Absent	**Rootwads**	Moderate	**Primary Substrate**	Cobble
Emergent Vegetation	Sparse	**Woody Debris**	Absent	**Overhanging Vegetation**	Sparse	**Artificial Structures**	Moderate	**Secondary Substrate**	Gravel

Figure 14: Surface Water Ambient Monitoring Program optical assessment of habitat conditions.

Directions to Site: Enter Camp Roberts through A Street. Take the left fork to California Blvd. Continue down California Blvd and bear right onto Nacimiento Road. Nacimiento Road turns into Perimeter Road near the Range Control Office. Go past Range Control and turn right onto Bee Rock Road and take the bridge over the Nacimiento River. Immediately after crossing the bridge turn right onto an unmarked dirt road. Follow the dirt road for 50 m until it crosses another dirt road that heads towards the river. Park at this site then walk upstream to find the logger.

Temperature Data: The water temperature provided below is based on daily mean, minimum, and maximum degrees Celsius, generated from hourly temperature recording from a Hobo U-22 data logger. Flow is provided in daily average cubic feet per second (cfs) generated from quarter hour preliminary data collected at the USGS 11149400 Nacimiento River below Nacimiento dam near Bradley, CA stream flow gage. Temperature is provided in daily average from the MCWRA weather station located near Nacimiento Dam approximately 9.0 km southwest of Site 7.5. The averages were generated from hourly data in Celsius.

The Hobo U-22 temperature logger was deployed at Site 7.5 on June 6, 2014. Data was collected continuously with downloads occurring on June 17 and 24, July 9 and 25, August 20, September 24, and October 21. The data represented in Figure 15 includes June 6, 2014 to October 21, 2014. The USGS adjusted preliminary (as of October 27, 2014) flow data based upon field measurements, therefore, they will not match data that was provided in the June, July, August, and September monitoring reports. The correction does not significantly alter the hydrograph.

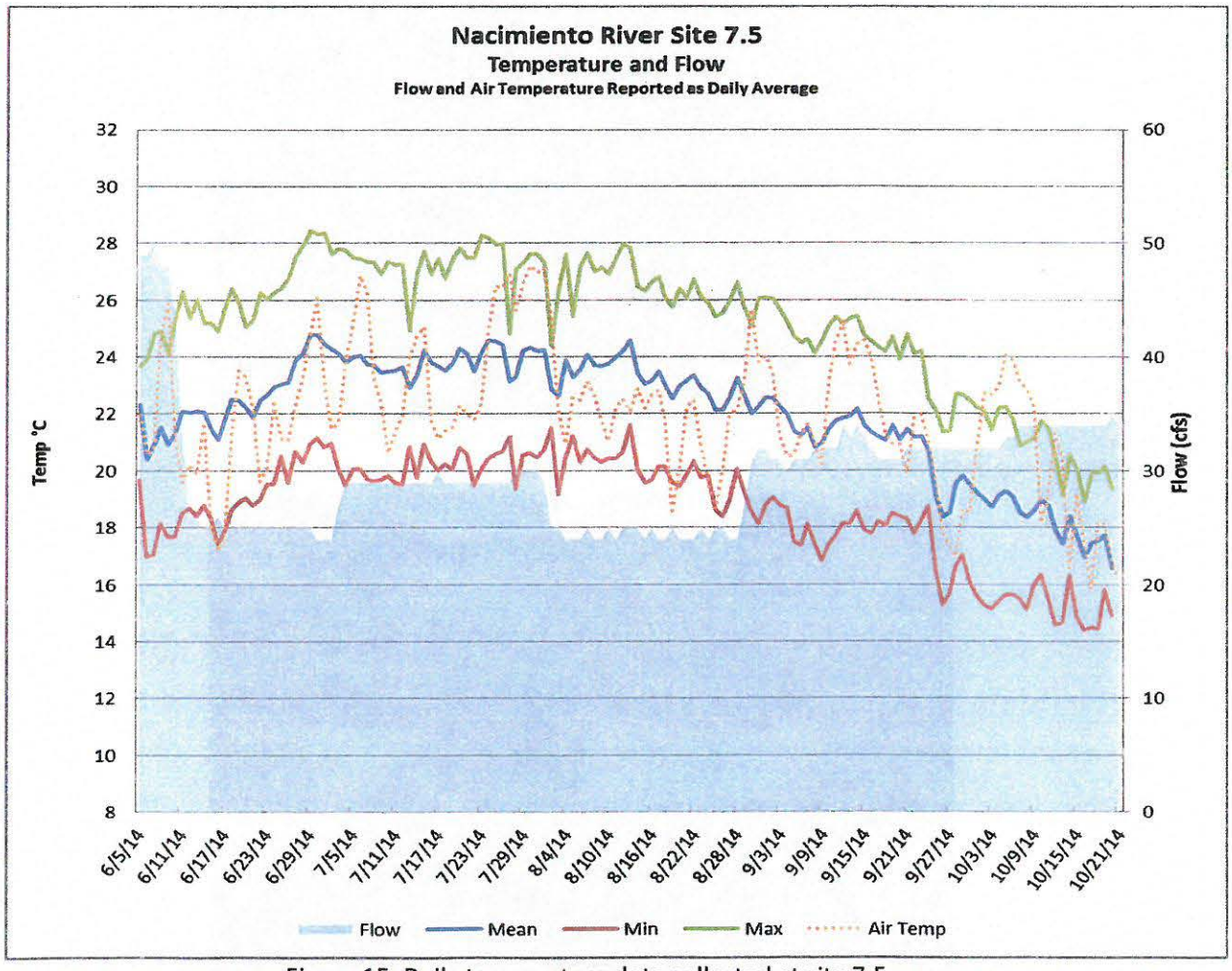


Figure 15: Daily temperature data collected at site 7.5.

Site 10

Location: 35°48'57.16"N 120°45'28.53"W

Site Description: The temperature logger is located approximately 18.0 km (11.18 miles) downstream of the Nacimiento Dam outlet. The monitoring station is located in a habitat best classified as a glide/run transition habitat. The logger is deployed on the left bank 5 m upstream of a river fording point crossing. A dirt road leads to the water edge and continues across the river at the site, approximately 300 m downstream of the abandoned Tower Road Bridge Crossing (figure 16 and 17). The logger is cabled to a vegetated berm. The cabling point is in line with a large oak tree on the left bank.

Figure 16: Site 10 aerial image.

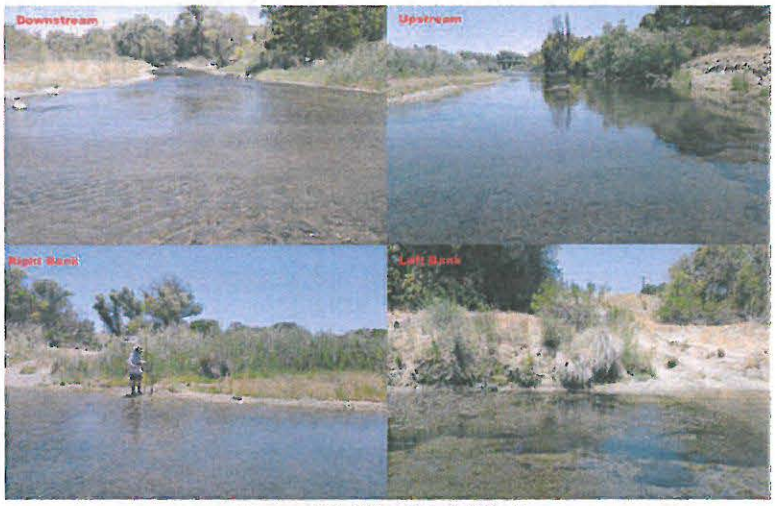


Figure 17: Site 10 at 28 cfs.

Habitat Description: The logger is located in a glide/run transition as it flows from a uniform low velocity habitat upstream. The logger is positioned in the left bank dominated thalweg, amongst rooted aquatic vegetation. The maximum depth of the channel is approximately 50 cm (Figure 18). The habitat upstream consists of open glides, and habitats that could potentially be classified as pool. The low gradient and lack of channel complexities makes habitat typing difficult. The area upstream has limited canopy cover and has slow velocity. The area downstream gets more complex with runs and riffles and the presence of habitat complexities. At the logger site, overhanging vegetation is absent and lacks habitat complexities (figure 19).

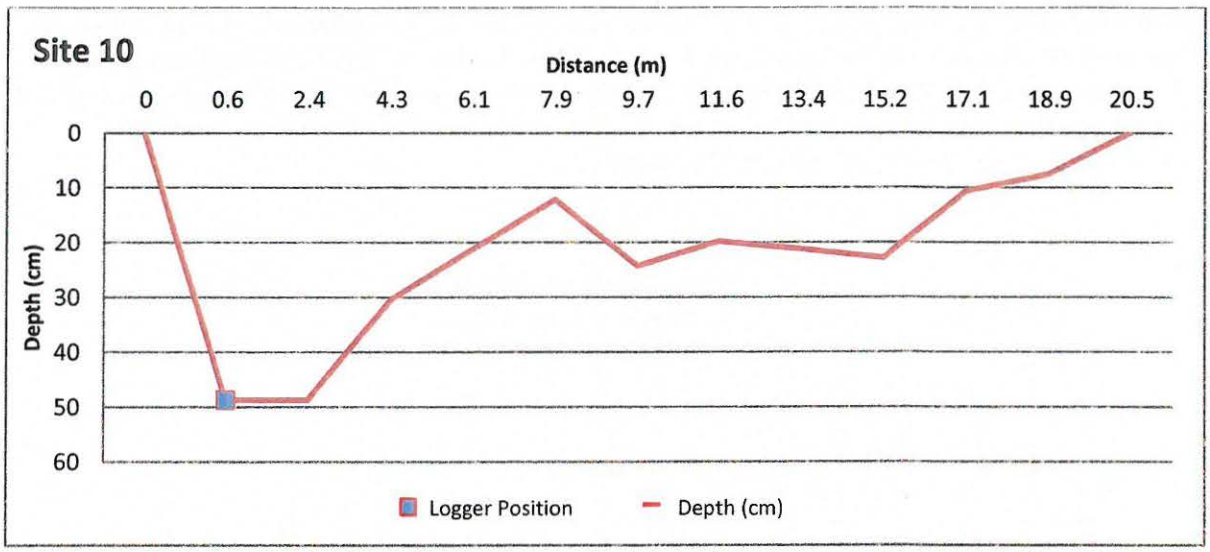


Figure 18: Site 7.5 depth profile starting on the left bank and progressing towards the right.

SWAMP Optical Habitat Evaluation (Ode, 2007)

Algae	Moderate	**Boulders**	Absent	**Undercuts**	Absent	**Rootwads**	Absent	**Primary Substrate**	Gravel
Emergent Vegetation	Moderate	**Woody Debris**	Absent	**Overhanging Vegetation**	Absent	**Artificial Structures**	Absent	**Secondary Substrate**	Cobble

Figure 19: Surface Water Ambient Monitoring Program optical assessment of habitat conditions.

Access Instructions: Enter Camp Roberts through A Street. Take the left fork to California Blvd. Continue down California Blvd and turn Right onto Arizona Blvd. Bear right onto Bridge Road. Before you cross the Bridge over the Nacimiento River turn right onto Well Rd. Take a small unmarked dirt road on the left side towards the river. At time of deployment the road had a small flooded portion. Stay on the left side of the flooded portion. Follow the road down to the water's edge by taking your first fork to the left. Follow the road to the water's edge. The logger is located on the opposite bank.

Temperature Data: The water temperature provided below is based on daily mean, minimum, and maximum degrees Celsius, generated from hourly temperature recording from a Hobo U-22 data logger. Flow is provided in daily average cubic feet per second (cfs) generated from quarter hour preliminary data collected at the USGS 11149400 Nacimiento River below Nacimiento dam near Bradley, CA stream flow gage. Temperature is provided in daily average from the MCWRA weather station located near Nacimiento Dam approximately 13.1 km southwest of Site 10. The averages were generated from hourly data in Celsius.

The Hobo U-22 temperature logger deployed to satisfy the Biological Opinion collected continuously with downloads occurring on June 17 and 24, July 8 and 25, August 20, September 24, and October 23. The data represented in Figure 20 includes June 5, 2014 to October 22, 2014. The USGS adjusted preliminary (as of October 27, 2014) flow data based upon field measurements, therefore, they will not match data that was provided in the June, July, August, and September monitoring reports. The correction does not significantly alter the hydrograph.

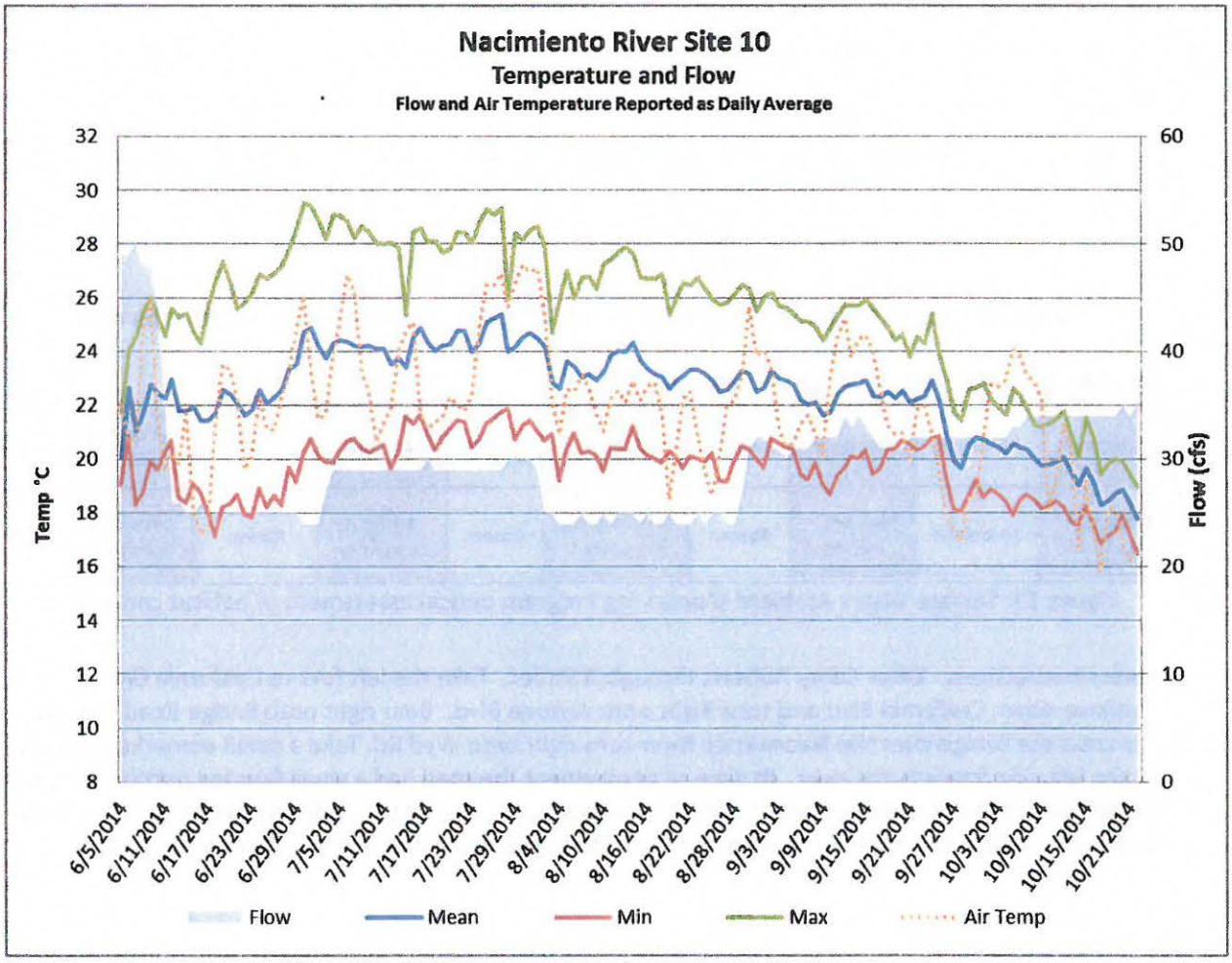


Figure 20: Daily temperature data collected at Site 10.

Site 10 Riffle

Location: 35°48'59.89"N 120°45'25.43"W

Site Description: The temperature logger is located approximately 18.12 km (11.26 miles) downstream of the Nacimiento Dam outlet. The monitoring station is located in a riffle habitat as it enters a pool. The logger is deployed on the right bank directly downstream of a river forging point crossing. A dirt road leads to the water edge and continues parallel through the channel (figure 21 and 22). The deployment location is approximately 330 m upstream of the Highway 101 overcrossing. The logger is cabled to a willow that is overhanging the right bank.

Figure 21: Site 10 Riffle aerial image.

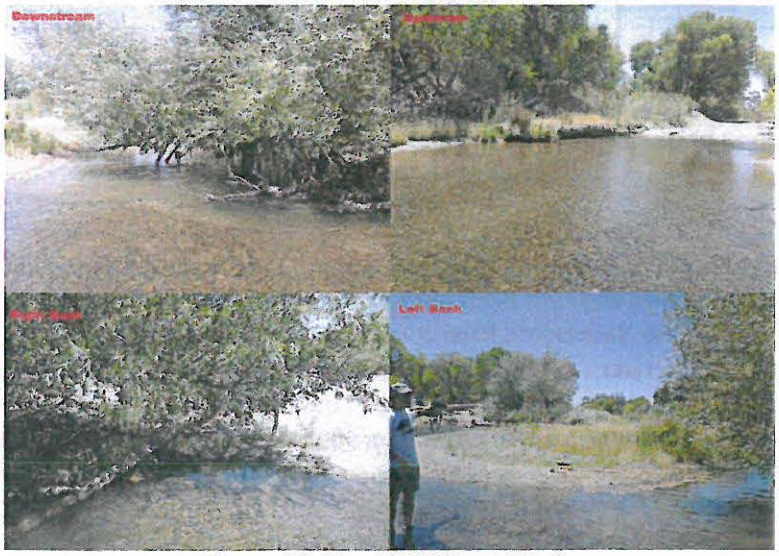


Figure 22: Site 10 Riffle at 28 cfs.

Habitat Description: The logger is located in a riffle as it transition into a pool. The logger is positioned along the right bank of a central thalweg. The maximum depth of the channel is approximately 55 cm (Figure 23). The habitat upstream consists of a shallow riffle, exiting a run. This site is downstream of Site 10 by approximately 120 m and lacks canopy cover. The area downstream of the logger becomes more complex with runs and riffles and the presence of habitat complexities such as woody debris. At the logger site, overhanging vegetation is heavy providing shade over the logger and has habitat complexities in the form of rootwads and woody debris (figure 24).

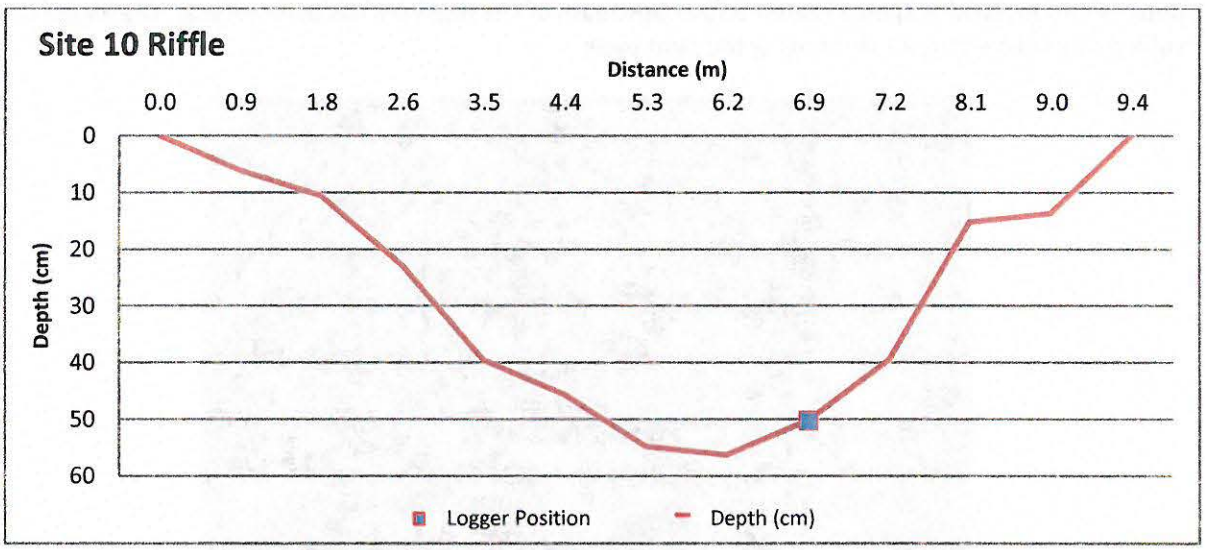


Figure 23: Site 7.5 depth profile starting on the left bank and progressing towards the right.

SWAMP Optical Habitat Evaluation (Ode, 2007)

Algae	Moderate	**Boulders**	Absent	**Undercuts**	Moderate	**Rootwads**	Moderate	**Primary Substrate**	Gravel
Emergent Vegetation	Sparse	**Woody Debris**	Moderate	**Overhanging Vegetation**	Heavy	**Artificial Structures**	Absent	**Secondary Substrate**	Cobble

Figure 24: Surface Water Ambient Monitoring Program optical assessment of habitat conditions.

Access Instructions: Enter Camp Roberts through A Street. Take the left fork to California Blvd. Continue down California Blvd and turn Right onto Arizona Blvd. Bear right onto Bridge Road. Before you cross the Bridge over the Nacimiento River turn right onto Well Rd. Take a small unmarked dirt road on the left side towards the river. At time of deployment the road had a small flooded portion. Stay on the left side of the flooded portion, but take the fork in the road to the right. The dirt road leads to the water's edge at another fording point. Park at this location and the logger is located downstream.

Temperature Data: The water temperature provided below is based on daily mean, minimum, and maximum degrees Celsius, generated from hourly temperature recording from a Hobo U-22 data logger. Flow is provided in daily average cubic feet per second (cfs) generated from quarter hour preliminary data collected at the USGS 11149400 Nacimiento River below Nacimiento dam near Bradley, CA stream flow gage. Temperature is provided in daily average from the MCWRA weather station located near Nacimiento Dam approximately 13.1 km southwest of Site 10 riffle. The averages were generated from hourly data in Celsius.

The Hobo U-22 temperature logger was deployed at Site 10 Riffle on June 12, 2014. Data was collected continuously with downloads occurring on June 17 and 24, July 9 and 25, August 20, September 24, and October 21. The data represented in Figure 2 5 includes June 12, 2014 to October 21, 2014 temperature data. The USGS adjusted preliminary (as of October 27, 2014) flow data based upon field measurements, therefore, they will not match data that was provided in the June, July, August, and September monitoring reports. The correction does not significantly alter the hydrograph.

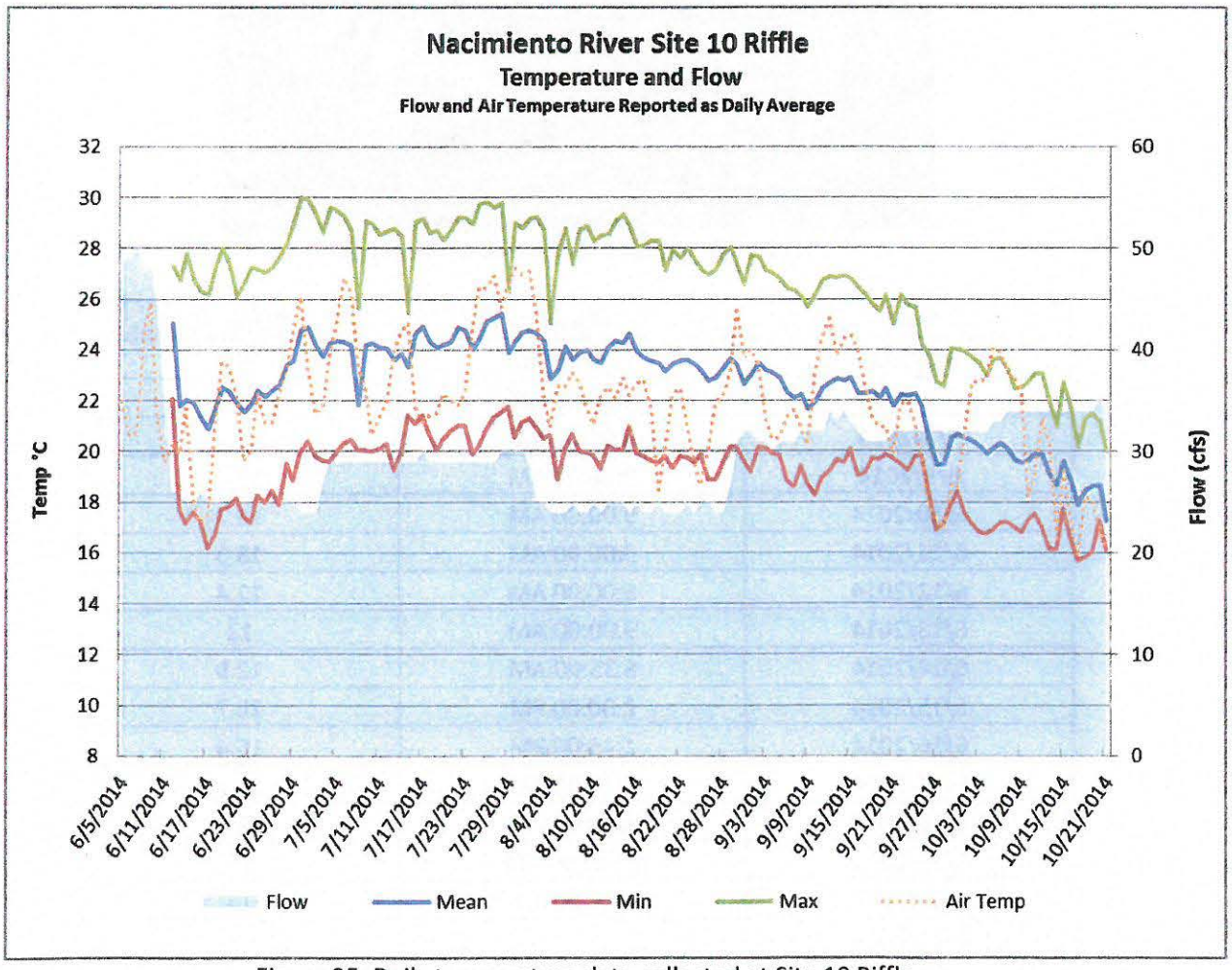


Figure 25: Daily temperature data collected at Site 10 Riffle.

Heritage Ranch Temperature Data

Instantaneous temperature data is collected once daily at the Heritage Ranch intake structure. This data is collected by Heritage Ranch Staff and is not regulated or evaluated by MCWRA staff. The temperature is of the water drawn from the Nacimiento River approximately 0.64 km (0.42 miles) downstream of the outlet (Figure 26). Temperature readings are collected at variable times daily. All data provided to MCWRA as of October 27, 2014, is presented in the table below (Figure 27).

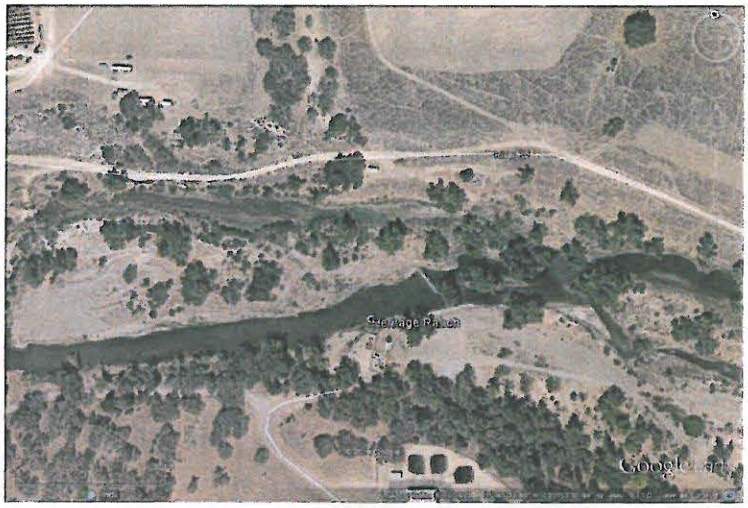


Figure 26: Heritage Ranch Site aerial image

Date	Time	Temp °C
6/6/2014	9:00:00 AM	13.2
6/7/2014	9:00:00 AM	12.8
6/8/2014	9:00:00 AM	13.1
6/9/2014	9:00:00 AM	13.5
6/10/2014	9:00:00 AM	13.7
6/11/2014	9:00:00 AM	13.5
6/12/2014	9:00:00 AM	12.4
6/13/2014	9:00:00 AM	12
6/14/2014	8:35:00 AM	12.9
6/15/2014	2:30:00 PM	16.7
6/16/2014	1:45:00 PM	16.4
6/17/2014	2:10:00 PM	16.1
6/18/2014	3:00:00 PM	16.3
6/19/2014	10:18:00 AM	15
6/20/2014	9:14:00 AM	14
6/21/2014		
6/22/2014		
6/23/2014	1:05:00 PM	16.6
6/24/2014	1:00:00 PM	16.4
6/25/2014	2:18:00 PM	16.6

6/26/2014	1:57:00 PM	17.6
6/27/2014	2:10:00 PM	17.4
6/28/2014	2:42:00 PM	17.8
6/29/2014	1:35:00 PM	16.9
6/30/2014	2:42:00 PM	17.0
7/1/2014	1:07:00 PM	16.7
7/2/2014	1:31:00 PM	17.4
7/3/2014		
7/4/2014	1:45:00 PM	17.2
7/5/2014	1:30:00 PM	16.9
7/6/2014	2:15:00 PM	17.1
7/7/2014	1:30:00 PM	17.0
7/8/2014	10:30:00 AM	14.7
7/9/2014	3:00:00 PM	15.4
7/10/2014	9:01:00 AM	13.7
7/11/2014	2:45:00 PM	16.0
7/12/2014	11:26:00 AM	15.9
7/13/2014	1:08:00 PM	16.7
7/14/2014	8:15:00 AM	12.9
7/15/2014	1:18:00 PM	16.4
7/16/2014	2:00:00 PM	16.2
7/17/2014	9:30:00 AM	14.6
7/18/2014	1:04:00 PM	16.4
7/19/2014	1:37:00 PM	15.9
7/20/2014	2:00:00 PM	15.6
7/21/2014	2:52:00 PM	16.7
7/22/2014	1:00:00 PM	17.5
7/23/2014	9:40:00 AM	15
7/24/2014	2:15:00 PM	17.7
7/25/2014	3:09:00 PM	17
7/26/2014	2:07:00 PM	16.8
7/27/2014	2:21:00 PM	15.4
7/28/2014	3:00:00 PM	15.6
7/29/2014	2:04:00 PM	15.6
7/30/2014	1:00:00 PM	16.4
7/31/2014	9:00:00 AM	14.1
8/1/2014	8:30:00 AM	14.8
8/2/2014	2:30:00 PM	15.4
8/3/2014	1:30:00 PM	15.8
8/4/2014	1:00:00 PM	15.9
8/5/2014	1:04:00 PM	16.2

8/6/2014	2:51:00 PM	17.1
8/7/2014		
8/8/2014	1:10:00 PM	16.7
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8/11/2014	12:57:00 PM	16.7
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8/13/2014	11:15:00 AM	16.4
8/14/2014	8:40:00 AM	13.6
8/15/2014	10:10:00 AM	15.4
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8/16/2014	12:46:00 PM	17
8/17/2014	1:49:00 PM	16.9
8/18/2014	2:00:00 PM	16.9
8/19/2014	12:26:00 PM	17.1
8/20/2014	2:30:00 PM	16.8
8/21/2014	9:23:00 AM	14.1
8/22/2014	10:41:00 AM	15
8/23/2014	9:00:00 AM	14.6
8/24/2014	10:00:00 AM	14.9
8/25/2014	8:00:00 AM	14.2
8/26/2014	8:25:00 AM	14.4
8/27/2014	9:11:00 AM	14.1
8/28/2014	12:37:00 PM	16.8
8/29/2014	8:45:00 AM	13.9
8/30/2014	2:27:00 PM	17.1
8/31/2014	10:14:00 AM	15.9
9/1/2014	8:15:00 AM	15.8
9/2/2014	1:10:00 PM	16.7
9/3/2014	1:46:00 PM	16.4
9/4/2014	11:20:00 AM	15
9/5/2014	9:40:00 AM	14.5
9/6/2014	8:19:00 AM	14.3
9/7/2014	11:30:00 AM	15.5
9/8/2014	12:42:00 PM	16.8
9/9/2014	1:47:00 PM	17.1
9/10/2014	11:15:00 AM	16.9
9/11/2014	2:30:00 PM	17.4
9/12/2014	1:05:00 PM	17.1

Figure 27: Heritage Ranch inlet temperature data.

MONTEREY COUNTY WATER RESOURCES AGENCY
BOARD OF DIRECTORS - RESERVOIR OPERATIONS COMMITTEE

MEETING DATE:	November 6, 2014		**AGENDA ITEM:**
AGENDA TITLE:	San Antonio Reservoir Water Quality Sampling Update		
	Consent ( ) **Action ( )** **Information (X)**		
SUBMITTED BY: **PHONE:**	Tamara Voss (831) 755-4860	**PREPARED BY:** **PHONE:**	Tamara Voss (831) 755-4860
DEADLINE FOR BOARD ACTION:		November 6, 2014	

RECOMMENDED BOARD ACTION:

None – item presented for informational purposes.

SUMMARY:

The Reservoir Operations (Res-Op) Committee, at their meeting of September 4, 2014 and the Board of Directors meeting of September 22, 2014 discussed the risk posed by cattle and wildlife to the water quality of San Antonio Reservoir. Specific concerns were to the possible risk of human exposure to high concentrations of bacterial pathogens. To address these concerns staff was directed to perform specific water quality sampling to identify if water conditions exist that may pose a risk to human health.

DISCUSSION/ANALYSIS:

Staff sampled San Antonio Reservoir on October 13, 2014. Three sites were chosen along the extent of the Reservoir. Samples were taken at the surface and at depth at each site, for a total of six sample locations.

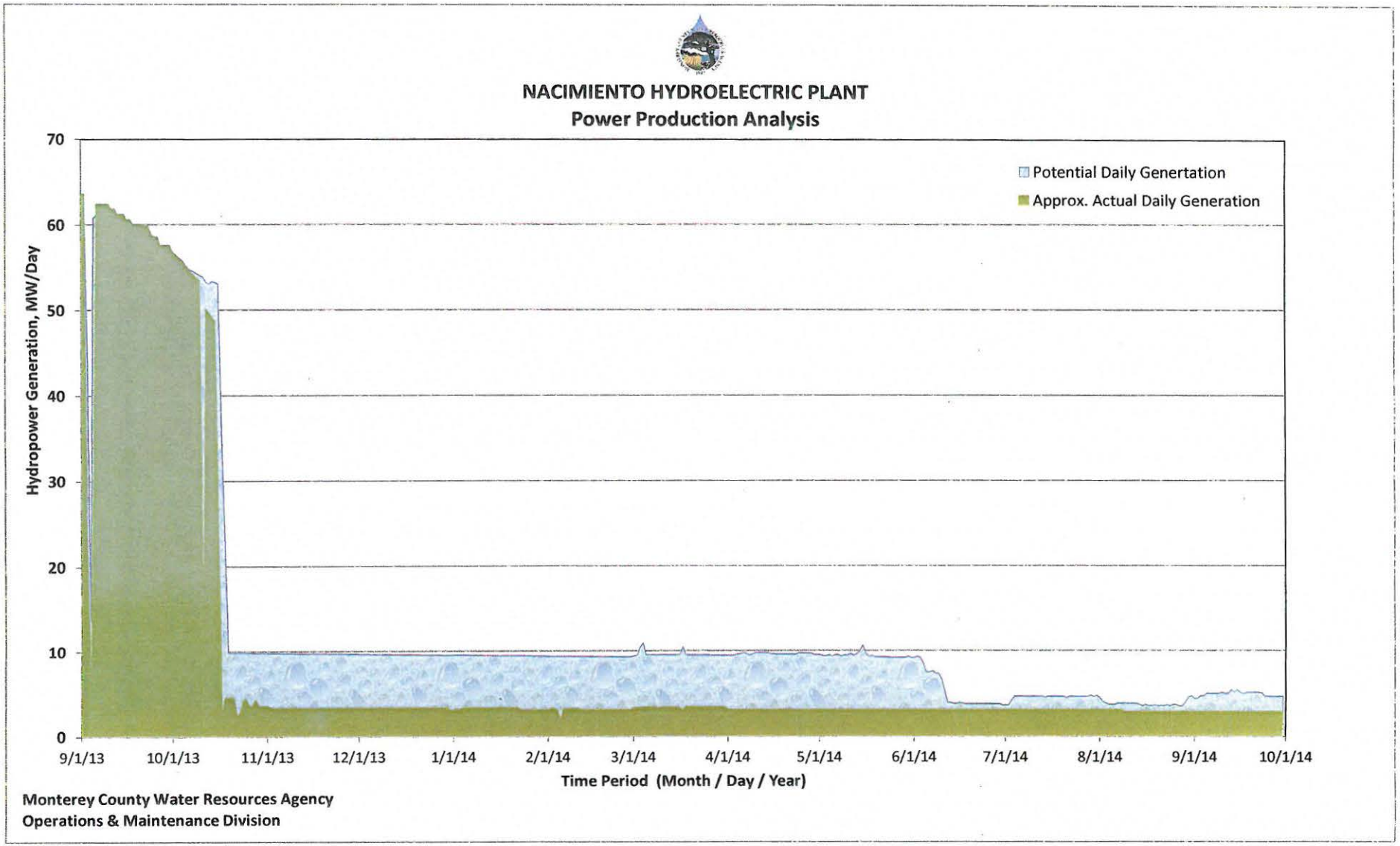
Samples were delivered to the Monterey County Consolidated Laboratory (ELAP #1395) the same day. Samples were analyzed for *Enterococcus*, Total and Fecal Coliform, and *E. coli*. All results were below PQL (Practical Quantitation Limits) or if present were below CDPH (California Department of Public Health) standards.

NEXT STEPS:

Staff seeks direction on additional sampling events.

FINANCING:

Staff estimates this sampling event at approximately $2,600. A funding source for this and any future sampling events have not been identified.



ATTACHMENT 7

MONTEREY COUNTY WATER RESOURCES AGENCY
BOARD OF DIRECTORS

MEETING DATE:			**AGENDA ITEM:**
AGENDA TITLE:	Consider receiving a report on the safety of Nacimiento and San Antonio Dams		
Consent ( )	**Action (X)**	**Information ( )**	
SUBMITTED BY: **PHONE:**	Brent Buche 755-4860	**PREPARED BY:** **PHONE:**	Chris Moss 755-4860
DEADLINE FOR BOARD ACTION:			

RECOMMENDED BOARD ACTION:

Receive the report on the safety of Nacimiento and San Antonio Dams.

SUMMARY:

Surveys, inspections and ongoing maintenance of Nacimiento and San Antonio Dams indicate that both dams are safe for continued operation. Monitoring and maintenance of both dams is ongoing to ensure their continued safe operation.

DISCUSSION/ANALYSIS:

Nacimiento and San Antonio Dams are significant assets to Monterey County and their safe performance is high priority for the Monterey County Water Resources Agency (MCWRA). Dam safety jurisdiction for Nacimiento Dam is held by MCWRA, the Federal Energy Regulatory Commission (FERC) under Title 18, Part 12 of the Code of Federal Regulations (18CFR Part 12), and the California Department of Water Resources, Division of Safety of Dams (DSOD) under California Water Code, Division 3, Dams and Reservoirs. Dam safety jurisdiction for San Antonio Dam is held by MCWRA and DSOD.

MCWRA is responsible for operation, maintenance, monitoring and inspection of both dams. Both dams are regularly visually inspected, monitored for vertical settlement and horizontal shift, seepage, erosion, structural integrity and operational effectiveness. Surveys, inspections and ongoing maintenance of Nacimiento and San Antonio Dams indicate that both dams are safe for continued operation, as reported by MCWRA, FERC and DSOD. Monitoring and maintenance of both dams is ongoing to ensure their continued safe operation.

In compliance with a recent FERC requirement, an Owner's Dam Safety Program for Nacimiento Dam (ODSP) was adopted by the MCWRA Board of Directors in April 2014. This report is in compliance with Section 6.1.6 of the ODSP. A copy of the ODSP is attached for reference.

Reports prepared by and activities performed by MCWRA regarding the condition and safety of

each dam include:

Nacimineto Dam

- On-Site Inspections (Multiple per year)
- Safety Surveillance and Monitoring Report (Annual)
- Update the Emergency Action Plan (Annual)
- Internal Assessment of Dam Safety Program and Report to FERC (Annual)
- MCWRA Executive Staff Dam Safety Meeting (Annual, or as-needed)
- Dam Safety Report to Reservoir Operations Committee (Annual)
- Dam Safety Report to Board of Directors (Annual)
- 18CFR Part 12D Independent Consultant Inspection and Report (Every 5 years)
- Update Safety Surveillance and Monitoring Plan (As-needed)
- Certify Spillway Gate Operation (Annual)

San Antonio Dam

- On-Site Inspections (Multiple per year)
- Performance Evaluation Report (Annual)

Both Dams

- Emergency Action Plan Outside Entity Orientation (Annual)
- Emergency Action Plan MCWRA Staff Orientation (Annual)

While maintenance and monitoring of various dam features is planned and ongoing, there are no maintenance items that jeopardize the safe operation of either dam.

The results of an internal assessment of the dam safety program for 2014, proposed improvement plans thereto, and maintenance items planned for both dams will be orally presented to the Reservoir Operations Committee.

OTHER AGENCY INVOLVEMENT:

Dam safety jurisdiction for Nacimiento Dam is also held by the Federal Energy Regulatory Commission and the California Department of Water Resources, Division of Safety of Dams (DSOD). Dam safety jurisdiction for San Antonio Dam is also held by DSOD. Neither FERC nor DSOD contributed to this report.

FINANCING:

Reports and activities described herein are funded by MCWRA Fund 116, Zone 2C, Dam Operations and Maintenance. There is no financial action associated with receiving this report.

FINANCIAL IMPACT:	**YES ( )** **NO (X)**
FUNDING SOURCE:	N/A
COMMITTEE REVIEW AND RECOMMENDATION:	
ATTACHMENTS:	1. Copy of MCWRA Owner's Dam Safety Program for Nacimiento Dam, dated February 26, 2014 2. Copy of MCWRA Board of Directors Order No. 14-27 3. Copy of FERC Letter of ODSP Acceptance, dated April 11, 2014
APPROVED:	**General Manager** **Date**

ATTACHMENT 8

Monterey County Water Resources Agency's Owner's Dam Safety Program For Nacimiento Dam (FERC Project No. 6378)

Prepared by:

Monterey County Water Resources Agency
893 Blanco Circle
Salinas, CA 93901

February 26, 2014

ATTACHMENT 8a

This page allows for double sided printing.

Monterey County Water Resources Agency's Owner's Dam Safety Program
For Nacimiento Dam Project Number 6378

TABLE OF CONTENTS

1 INTRODUCTION

The Federal Energy Regulatory Commission (FERC) implements its responsibilities for dam safety through its regulations in the Code of Federal Regulations, Title 18, Part 12 (18CFR Part 12). Specifically, under Part 12, Section 12.4(b)(2)(ii) the FERC may require a facility owner under FERC jurisdiction (FERC license) to submit reports or information on any condition affecting the safety of a project.

This written Dam Safety Program, a recent FERC requirement, is considered a critical factor in maintaining safe dams and preventing dam failures. The objective of this program is to document best practices to develop and implement an effective performance monitoring program for dam surveillance, inspection, instrumentation needs and maintenance, data collection, data management, data analysis, and data interpretation. This includes identifying the responsibilities of management and the key components for managing the overall performance monitoring program along with proper coordination and communications between and among the responsible parties.

A key component of a comprehensive dam safety program is the owner's performance monitoring program that includes policies and procedures to assure the data obtained are accurate and evaluated in a timely manner, anomalies are thoroughly investigated, and appropriate actions are taken in the event the data indicate the dam is behaving in an adverse manner. Effective performance monitoring provides sound data to help an owner identify, quantify and control these risks.

1.1 Purpose:

Establish and define the Dam Safety Program for Nacimiento Dam to ensure dam safety and compliance with FERC requirements for the dam which is owned and operated by the Monterey County Water Resources Agency (MCWRA).

1.1.1 In particular, the Dam Safety Program is intended to ensure that MCWRA's employees, agents, and consultants have a complete understanding of, and a constant awareness of, the need to fully comply with all necessary dam safety measures and requirements. The Dam Safety Program will help safeguard lives and reduce damage at Nacimiento Dam and Reservoir, and along the Nacimiento and the Salinas Rivers.

1.1.2 The Dam Safety Program is intended to accomplish the objectives of this section by prescribing the following as to MCWRA's employees, agents and consultants:

- the dam safety related training required of such individuals on a regular or as needed basis;
- the protocols for communications by and among such individuals, and with FERC, on dam safety related matters;

- how dam safety related issues should be identified, and how dam safety related concerns should be resolved, within MCWRA;
- audits and assessments as to performance and quality of dam safety related operation; and
- the record keeping required to implement the above.

1.1.3 Clearly state the policies and expectations of the management of MCWRA regarding dam safety and regulatory compliance for FERC approved facilities.

1.2 Scope:

1.2.1 The requirements of this program apply to MCWRA's hydroelectric project approved by the FERC: The Nacimiento Dam Project No. 6378-CA.

1.2.2 This program defines the Dam Safety Program for the Nacimiento Dam (FERC approved facility) and supercedes other MCWRA programs and procedures related to dam safety and regulatory compliance for the facility. Appropriate procedures and documents related to dam safety and regulatory compliance shall be routed through the Chief Dam Safety Engineer to ensure compliance with this program.

2 TERMS and DEFINITIONS

2.1 **Assessment** - A documented routine review conducted to evaluate the performance or effectiveness of an activity.

2.2 **Audit** - An objective examination and evaluation of dam safety and regulatory compliance or effectiveness in accordance with a defined set of standards and a formal Audit plan.

2.3 **Chief Dam Safety Engineer** - The engineer with responsibility and authority to ensure the Dam Safety Program is fully implemented and to ensure high standards are maintained for dam safety and regulatory compliance. The Chief Dam Safety Engineer is the single point of contact for non-emergency regulatory communications from MCWRA to FERC and reports directly to the Assistant General Manager- Operations & Maintenance Division. The Deputy Chief Dam Safety Engineer shall act for the Chief Dam Safety Engineer in his or her absence.

2.4 **Dam** - An engineered barrier constructed to contain a body of water, or control the flow or level, relative to the facilities described in Section 1.2.

2.5 **Dam Safety Inspection** - A scheduled dam safety inspection performed in accordance with a documented inspection plan or checklist. These inspections will be performed by operations personnel, MCWRA engineering staff, or other qualified consultants.

2.6 **Deputy Chief Dam Safety Engineer** – the engineer that will act for the Chief Dam Safety Engineer in his or her absence, and assist the Chief Dam Safety Engineer as needed in all matters of MCWRA's dam safety program

2.7 **Emergency Action Plan (EAP)** – A guide for dealing with emergency situations at a Project approved by FERC and updated on a regular basis. As emergency situations develop, officials and emergency personnel are to use their best judgment for dealing with developing situations.

2.8 **FERC** - Federal Energy Regulatory Commission

2.9 **FERC Operational Inspection** - An annual formal inspection conducted by a FERC inspector. As required, the FERC inspector will be supported by the Operations staff and the MCWRA engineering staff.

2.10 **FERC Part 12D Safety Inspection** - A formal inspection at five year intervals to be conducted by the approved FERC Independent Consultant in conjunction with the Chief Dam Safety Engineer.

2.11 **FERC Independent Consultant** - A third party consultant contracted to perform the FERC Part 12D Safety Inspection.

2.12 **Independent Consultant** - A third-party consultant contracted to perform specific duties other than the FERC Part 12D Safety Inspection.

2.13 **Modification(s)** - Activities that change the physical features or design of the project from the state reflected in the plans or drawings or other documents filed with the FERC.

3 DAM SAFETY POLICY, OBJECTIVES AND EXPECTATIONS

3.1 MCWRA Management Policies and Expectations

3.1.1 It is MCWRA's policy to maintain safe and compliant operation as its first priority. MCWRA employees and consultants shall implement this policy in the conduct of their work assignments.

- MCWRA's employees, agents and consultants shall operate its FERC approved facility consistent with the commitment of MCWRA to good stewardship and responsible behavior.
- This shall include an awareness by MCWRA's employees, that they are entrusted with the responsibility and privilege to operate MCWRA's dams and generating plant in a safe, reliable and efficient manner. Further, this shall include an awareness by MCWRA's employees that MCWRA's daily operating practices must always place public safety, personnel safety and regulatory compliance above all other performance goals of MCWRA.

3.1.2 Production or other business objectives shall not be allowed to compromise dam safety or regulatory compliance. MCWRA shall also incorporate this policy into

the daily operations of its FERC approved facility through regular and as needed discussions and training sessions.

3.1.3 This program implements commitments to the FERC to maintain compliance with FERC dam safety and regulatory requirements. Proposed changes to the requirements of this program shall be communicated in writing to the FERC Regional Engineer for review and written acceptance prior to implementation.

3.1.4 The objective of the Dam Safety Program for the FERC approved facility is to assure continuing safe and compliant operation through the following program initiatives:

- Clearly communicate policies and expectations regarding dam safety and regulatory compliance.
- Implement program quality elements.
- Implement organizational changes to assure compliance with FERC requirements for dam safety.
- Define protocols for communications and for reporting dam safety issues.
- Define the authority of the Chief Dam Safety Engineer.
- Provide a comprehensive Training Plan for dam safety.
- Require internal and external Audits and Assessments to ensure compliance and to achieve an ongoing focus on dam safety and regulatory compliance.
- Create and implement a Dam Safety Inspection Program

3.1.3 MCWRA expects that its employees, agents and consultants performing services for a FERC approved facility will fully comply with all of FERC's dam safety related requirements.

- These include the requirement to use sound and prudent engineering practices in any action relating to the design, construction, operation, maintenance, use, repair, or modification of such projects (18 C.F.R. 12.5).
- These also include the requirement to notify FERC about the following, in the manner specified in the cited regulations:
  - as to any condition affecting the safety of a project or project works (18 C.F.R. 12.1 0); and
  - as to any modification to the project or project works (18 C.F.R. 12.1 1).
- They further include the requirement to comply with all additional items specified in the license applicable to each FERC approved project.
- MCWRA will communicate these requirements to the applicable employees, agents and consultants in training sessions by providing a copy of this Dam Safety Program to them and discussing it with them in training sessions and otherwise, as needed. The Chief Dam Safety Engineer or his designee is authorized to determine the proper level of training required of such

employees, agents or consultants based on his judgment as to the relevant factors, including but not limited to the following: prior experience, background, expected services to be performed for MCWRA, and the impact of such services on dam safety and compliance with FERC regulations.

3.2 Program Quality Elements

3.2.1 The Chief Dam Safety Engineer, MCWRA engineering staff and and plant operations staff, shall develop and implement quality management elements, including but not limited to:

- The Chief Dam Safety Engineer (or designee) independent review and approval of proposed Modifications.
- Written procedures to perform documented dam inspections.
- Qualification standards for dam inspection personnel.
- A formal Surveillance and Monitoring Plan which meets FERC requirements.
- An instrument calibration program.
- Risk assessment to prioritize issues identified during inspections.
- Training in accordance with the Training Plan for Dam Safety.
- Retention of records.

3.3 Dam Safety Inspection Program

3.3.1 The Chief Dam Safety Engineer shall direct the creation and implementation of a Dam Safety Inspection Program for the FERC approved facility.

3.3.2 The inspection program shall include detailed descriptions of inspections to be performed by the following personnel:

- Operations and Maintenance personnel
- Hydroelectric Operations personnel
- Engineering personnel
- Outside Consultants performing FERC Part 12 inspections and other inspections as necessary.

3.3.3 The inspection program documentation shall outline the frequency and type of inspections to be performed by the personnel included above.

3.3.4 The inspection program documentation shall also outline the instrumentation monitoring and assessments that will be part of the inspections.

4 RESPONSIBILITIES FOR DAM SAFETY

Assigned Responsibilities

4.1.1 Monterey County Water Resources Agency Board of Supervisors - The Board of Supervisors has overall responsibility for passing ordinances, conducting litigation matters, and adopting budgets for the Water Resources Agency.

4.1.2 Monterey County Water Resources Agency Board of Directors - The Board of Directors establishes long-term and short-term operations policy for the Agency, and recommends action to the Board of Supervisors for all aspects of the Agency.

4.1.3 Reservoir Operations Committee - Established in December 1993 by direction of the Monterey Water Resources Agency Board of Directors, the Committee makes recommendations to the Board of Directors relating to the overall Reservoir operations and to ensure that the interests of all those concerned with the flood control, conservation and recreational interests are maintained so as to optimize the resources available, to the greatest extent possible, and carry out the policies of the Boards.

4.1.4 Agency Staff - The General Manager, or his designee, is responsible for the safe and professional operation of Nacimiento Dam. Staff shall operate the Dam according to this Policy, using the professional judgment of qualified engineers. The Dam shall be operated with safety as the primary consideration. Operational considerations for flood control, water conservation and recreation will be given the careful, professional scrutiny they deserve.

4.1.5 Chief of Operations and Maintenance - The Chief of O&M is responsible for determining if conditions exist that could be qualified as an emergency and for dispatching a Professional Engineer or Professional Geologist registered in the State of California to Nacimiento Dam. The Professional Engineer or Geologist shall evaluate the situation, formulate and initiate any possible remedial action(s) to reduce the severity of the emergency and report changing conditions to the Chief of O&M. The Chief of O&M is the designated coordinator for all matters relating to the EAP. Responsibilities include preparing revisions to the plan, establishing training seminars and coordinating annual tests.

4.1.6 Chief Dam Safety Engineer - The engineer with responsibility and authority to ensure the Dam Safety Program is fully implemented and to ensure high standards are maintained for dam safety and related regulatory compliance. The Chief Dam Safety Engineer is responsible for the review, or obtaining qualified review, of all structural and operational modifications to the dam. The Chief

Dam Safety Engineer is the single point of contact for non-emergency regulatory communications from MCWRA to FERC and reports directly to the Assistant General Manager- Operations & Maintenance Division. The Chief Dam Safety Engineer shall designate a qualified alternate to act in his or her absence. The resume of the Chief Dam Safety Engineer is included in Appendix 2.

4.1.7 Hydro-Electric Plant Operator - The Hydroelectric Plant Operator is responsible for the overall plant status as well as the operating condition of all valves and gates of the hydroelectric plant. The Hydroelectric Plant Operator shall assist the Reservoir Operator in his responsibilities as directed by the Reservoir Operator. Upon direction from MCWRA supervisory or management personnel the Hydroelectric Plant Operator will operate valves and gates of the hydroelectric plant. In the event of an emergency, and if communications with supervisory or management personnel is not possible, the Hydroelectric Plant Operator is expected to use their best judgment regarding opening or closing of hydroelectric plant gates, valves or other equipment for the immediate safety of life or property, and communicate the situation to superiors as soon as possible.

4.1.8 Reservoir Operator - In the event of a sudden or imminent failure, the Reservoir Operator should report the emergency to the dispatcher at the Monterey County Communications Center (CCC) in Salinas, which will contact the Office of Emergency Services. The Reservoir Operator should then report the emergency to their immediate supervisor. If their supervisor or management cannot be reached, the response of the Reservoir Operator must be based on their best judgment and analysis of the situation.

4.1.9 Designated Agency Representative - If failure has occurred or is imminent, the Senior Hydrologist or the alternate, the Operation and Maintenance Associate Water Resources Engineer, shall be responsible for reporting the emergency to selected agencies with dam safety interest or responsibility. At the same time, specific MCWRA supervisory personnel, management, and others will be alerted according to the appropriate notification flowchart.

4.1.10 Consultants – Consultants performing work related to the dam shall be responsible for reporting issues related to dam safety to their assigned immediate supervision and to the Chief Dam Safety Engineer. Consultants will obtain review and approval from the Chief Dam Safety Engineer, or designee, of proposed design changes affecting dam safety, before implementation.

4.2 Authority of the Chief Dam Safety Engineer

The Chief Dam Safety Engineer shall be empowered with the following authority:

4.2.1 Order necessary corrective action if dam safety is in question. This authority includes the issuance of an oral or written stop work order for operational activities or an order for a hydroelectric plant shutdown, if necessary to place an affected dam in a safe condition.

- To remove any doubt, the Chief Dam Safety Engineer shall have the authority to direct any MCWRA employee, agent or consultant to take any action which in his judgment is necessary to ensure dam safety, including action to shut down the operation of Nacimiento Dam and/or the hydroelectric plant.

4.2.2 Conduct unannounced facility inspections.

4.2.3 Review and approve proposed Modifications or changes to a dam structure, operating system, control system, or critical maintenance or operations procedures before implementation. This review and approval may be delegated to a qualified person or persons; however, the Chief Dam Safety Engineer maintains overall accountability for the review process.

4.2.4 Approve dam safety instrumentation design for each applicable installation.

4.2.5 Request the use of external resources from consultants to assist with internal Assessments performed by the Chief Dam Safety Engineer or MCWRA Staff, if needed. Issue contracts for external Audits performed by third party consultants as required by FERC's Part 12D five year inspection cycle. Refer to section 10.2 for additional details on the internal Assessment and external Audits.

4.2.6 Create and enforce a schedule for internal Assessments and external Audits to evaluate compliance with the Dam Safety Program and to assure that required Audits and Assessments are completed in a timely and effective manner.

5 DAM SAFETY TRAINING PROGRAM

5.1 Training for Dam Safety

5.1.1 Training shall be implemented for personnel involved in the operation, maintenance, or modification of the dam or hydroelectric facilities on a level appropriate to the assigned responsibilities. Training shall include MCWRA management, operations, maintenance, engineering, consultant, and contractor

personnel, as appropriate. Training described in 5.1.2 will be performed annually for MCWRA personnel. Training for consultants and contractors will occur as appropriate.

5.1.2 Training shall include the following features:

- General and site-specific training focused on dam safety awareness and regulatory compliance.
- Presentation of the requirements of this Dam Safety Program
- Identification of potential dam safety deficiencies.
- Inspection and monitoring techniques.
- Qualification standards for personnel conducting inspections, consistent with the nature and complexity of assigned duties.
- Review of Emergency Action Plans.

5.1.3 Effectiveness of the training shall be one of the subjects of internal Assessments and external Audits. Findings and any corrective actions from these Assessments and Audits shall be included in the annual written report to the FERC described in Section 6.2.2.

5.1.4 A training outline is provided in Appendix 3.

5.1.5 In establishing and maintaining this training program, the Chief Dam Safety Engineer shall consider, and make use of, all appropriate materials, such as FERC's Part 12 regulations and its Engineering Guidelines for the Evaluation of Hydropower Projects, as well as opportunities to attend seminars, conferences and training programs sponsored by FERC and other dam safety organizations such as the Association of State Dam Safety Officials (ASDSO), the United States Society on Dams (USSD), and the National Hydropower Association/Hydro Users Group (NHA/HUG).

6 COMMUNICATIONS, COORDINATION, REPORTING & REPORTS

6.1 Internal Communications and Reports:

The MCWRA's dam safety program organizational chart is included as Appendix 1.

6.1.1 Personnel in dam or hydroelectric operations, and other support personnel, shall notify the Chief Dam Safety Engineer before a proposed dam or plant modification is made.

6.1.2 The following communications shall be implemented by MCWRA personnel:

- In an emergency, MCWRA personnel shall follow EAP communication lines
- MCWRA personnel and consultants shall report non-emergency issues related to dam safety or regulatory compliance to their immediate supervisor.
- Operations supervisory personnel shall promptly notify the Chief Dam Safety Engineer or Deputy Chief Dam Safety Engineer if a condition is identified which potentially affects dam safety.
- Supervisors and managers shall take immediate action if necessary to address issues related to dam safety and regulatory compliance. Additionally, they shall promptly notify the Chief Dam Safety Engineer or the Deputy Chief Dam Safety Engineer.
- Any employee or consultant may document or orally convey concerns to the Chief Dam Safety Engineer or the Deputy Chief Dam Safety Engineer and shall be provided full protection from any reprisal for communicating such concerns.
- The types of non-emergency incidents to be reported to the Chief Dam Safety Engineer include but are not limited to: observation of change in condition of the dam, such as seepage, ground deformations, structural cracks, or equipment malfunctions.

6.1.3 The Chief Dam Safety Engineer shall regularly report dam safety and regulatory compliance issues to the Assistant General Manager- Operations & Maintenance Division, who in turn reports to the General Manager.

6.1.4 The Chief Dam Safety Engineer is required to promptly notify the Assistant General Manager- Operations & Maintenance Division, regarding issues that could affect public safety or safe dam operations. In the event that the Assistant General Manager-, Operations & Maintenance Division, is unavailable, the Chief Dam Safety Engineer shall notify one or more of the following personnel as necessary: the Assistant General Manager- Water Resources Planning Division; or the General Manager.

6.1.5 The Chief Dam Safety Engineer shall report dam safety and regulatory compliance issues and conduct meetings with MCWRA senior management at least annually or more often if deemed necessary by the Chief Dam Safety Engineer. The minimum attendees shall include: Assistant General Manager- Operations & Maintenance Division; the Operations & Maintenance Superintendent; and the General Manager.

6.1.6 The Chief Dam Safety Engineer and the Assistant General Manager- Operations & Maintenance Division, will make an annual report to the Reservoir Operations Committee (Res Op committee). The report shall cover at a minimum the

following subjects: dam safety issues, internal Assessment and external Audit findings and ongoing improvement plans. The presentation to the Res Op committee will be maintained as a permanent record by the Chief Dam Safety Engineer. The Chairman of the Res Op committee or his designee, shall report to the MCWRA Board of Directors at its next regularly scheduled meeting concerning the annual report.

6.1.7 The Chief Dam Safety Engineer will remain responsible for requiring and directing internal Assessments and external Audits under this Dam Safety Program, and nothing in this section is intended to affect that responsibility.

6.2 External Communications and Reports

6.2.1 The Chief Dam Safety Engineer shall be the single point of contact between MCWRA and FERC for non-emergency regulatory reporting of dam safety issues. Except for those immediate communications required by emergency plans, communications related to dam safety and regulatory compliance between MCWRA and the FERC shall be routed through the Chief Dam Safety Engineer.

6.2.2 The Chief Dam Safety Engineer shall provide an annual written report to the FERC Regional Engineer, or present the report in person at the discretion of the FERC. The report shall include: operational status of the FERC regulated facilities, compliance status of facilities with applicable FERC regulations, findings and recommendations from internal Assessments and external Audits with plan and schedule on how and when recommendations are to be implemented. Section 10 describes internal Assessments and external Audits.

7 RECORD KEEPING AND DATABASES

	Record Type	Responsible Person	Retention Period	Location
7.1	Original Design and Construction related documents	Chief Dam Safety Engineer	Life of the Facility plus 10 years	Main Office Tube Files or digital record retention
7.2	Capital Improvement Project related documents	Chief Dam Safety Engineer	Life of the Facility plus 10 years	Main Office Tube Files or digital record retention
7.3	Records generated by inspection procedures, training plans, and other support activities.	Chief Dam Safety Engineer	Specified by originating procedures and programs	In custody of Chief Dam Safety Engineer or digital record retention
7.4	All correspondence between MCWRA and FERC related to hydro projects.	Chief Dam Safety Engineer	Life of the Facility plus 10 years	In custody of Chief Dam Safety Engineer or digital record retention
7.5	Incident Reports	Chief Dam Safety Engineer	Life of the Facility plus 10 years	In custody of Chief Dam Safety Engineer or digital record retention
7.6	Operations & Maintenance Documentation	Chief Dam Safety Engineer	Life of the Facility plus 10 years	In custody of Chief Dam Safety Engineer or digital record retention
7.7	Emergency Action Plan related documents	Chief Dam Safety Engineer	Specified by originating procedures and programs	In custody of Chief Dam Safety Engineer or digital record retention

8 SUCCESSION PLANNING

MCWRA engineering personnel will be involved with annual internal Assessment and MCWRA, FERC and DSOD dam inspections to gain knowledge on dam safety issues. This group includes younger engineers that would gain the required knowledge to assure a successful transition when senior positions become available.

The MCWRA Board of Directors has designated a Deputy Chief Dam Safety Engineer position as an alternate to the Chief Dam Safety Engineer to assure that the objectives

of the Owner's Dam Safety Program are fulfilled in cases when the Chief Dam Safety Engineer is not available.

The MCWRA will use trained MCWRA staff or qualified consultants as backup personnel to operate the hydroelectric plant when the full-time hydroplant operator is off-duty or unavailable.

9 CONTINUOUS IMPROVEMENT

The dam safety program will be reviewed every three years by the Chief Dam Safety Engineer, assisted by other engineering personnel as needed to assure that it reflects the current staffing and organizational structure of the MCWRA and incorporates lessons learned from the ongoing implementation of the program, information gathered from dam safety inspections and operating history, changes in the state-of practice in dam safety, knowledge gained from training and the study of case histories of incidents and failures and findings from internal Assessments and external Audits of the dam safety program.

10 INTERNAL ASSESSMENT AND EXTERNAL AUDIT OF THE DAM SAFETY PROGRAM

10.1 Internal Assessments

10.1.1 Internal Assessments will be conducted annually by the Chief Dam Safety Engineer and assisted as needed by MCWRA engineering staff. Internal Assessments will focus on operational compliance with and improvement to the dam safety program.

10.1.2 The internal Assessment will include items such as, but not be limited to, training and effectiveness of dam safety personnel, surveillance and inspection practices, emergency preparedness, ongoing maintenance, remediation of deficiencies or vulnerabilities, personnel communications, allocation of resources to the Dam Safety Program, and clarity of designation of responsibilities. Resources such as FERC's Owner's Self-Assessment Evaluation Parameters worksheets, or other similar documents, may be used to guide the Assessment.

10.2 External Audits

10.2.1 External Audits will be conducted by an independent third-party consultant with expertise in dam and hydroelectric project safety. The Chief Dam Safety

Engineer, or his designee, shall initiate a contract with the independent consultant to perform an external Audit.

10.2.2 External Audits will be scheduled in conjunction with FERC's Part 12D five year inspection cycle.

10.2.3 The Chief Dam Safety Engineer shall issue a report to the FERC Regional Engineer within 45 days of completion of an external Audit. The Chief Dam Safety Engineer shall instruct the third-party consultant to provide the issued written report for each external Audit to the FERC Regional Engineer at the same time the report is that they are provided to the Chief Dam Safety Engineer.

10.2.4 With regards to the dam safety program, these external Audits will include the following:

- Review operating and maintenance records for the facility to determine if proper notification procedures were followed.
- Review Surveillance and Monitoring Plan reports for the facility to verify compliance with the FERC approved Surveillance and Monitoring Plan.
- Review training records to verify that dam safety training is being provided in accordance with the plan.
- Conduct interviews, examinations, or other methods to evaluate the effectiveness of training.
- Interview the Chief Dam Safety Engineer and other MCWRA engineering staff as needed, Dam Safety Staff; maintenance superintendent, hydro plant operator, and other operations staff as needed to determine their understanding of the Dam Safety Program and the implementation of their respective responsibilities.

10.3 Reporting of Internal Assessments and External Audits

10.3.1 The Chief Dam Safety Engineer will prepare a summary of findings of internal Assessments or external Audits and report to MCWRA senior management annually. The minimum attendees shall include: Assistant General Manager-Operations & Maintenance Division, the Operations & Maintenance Superintendent, and the General Manager. The Chief Dam Safety Engineer will annually submit to FERC the findings and recommendations of internal Assessments and external Audits with plan and schedule on how and when recommendations are to implemented per Section 6.2.3.

11 REFERENCES

Monterey County Part 12D Inspection Report and STID for the Nacimiento Dam, 2007.

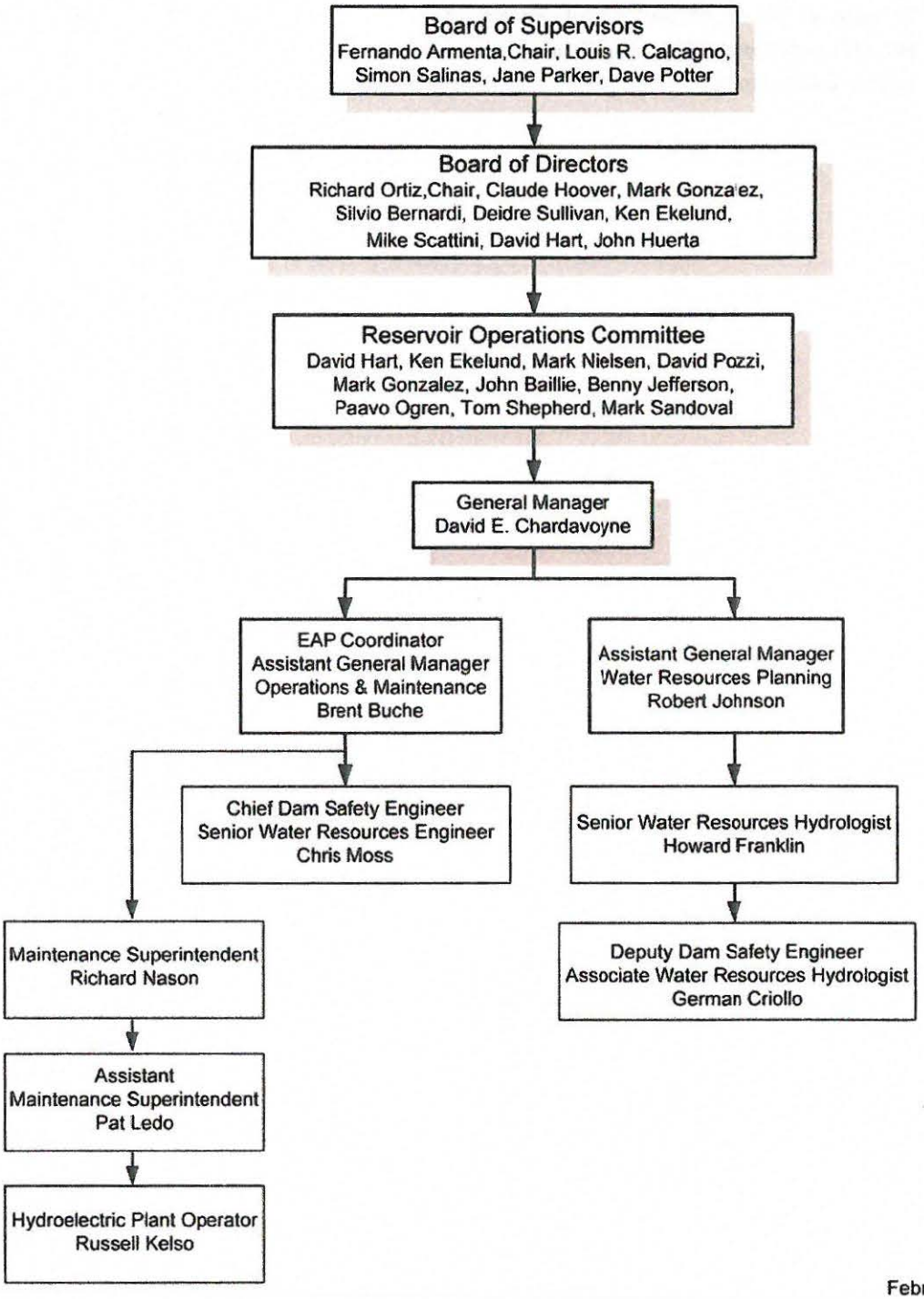
Monterey County Emergency Action Plan, December 2013.

4 APPENDICES

1. MCWRA's Owner's Dam Safety Program Organizational Chart
2. Resume of the Chief Dam Safety Engineer
3. MCWRA Personnel Training Outline
4. Safety Inspections

Appendix 1

Monterey County Water Resources Agency
Owner's Dam Safety Program Organizational Chart



February 14, 2014

Appendix 2

Resume of the Chief Dam Safety Engineer

Christopher M. Moss, PE
Senior Water Resources Engineer
Monterey County Water Resources Agency

Education	BSc – Agricultural Engineering Calif. Polytechnic State Univ., San Luis Obispo, 1988
Registration	Professional Civil Engineer 54412, California, 1995
Professional History	Monterey County Water Resources Agency Salinas, CA 1993 – Present USDA Soil Conservation Service Salinas, CA 1989 – 1993

Representative Professional Experience

- Nacimiento Dam and San Antonio Dam inspection 2003 to Present – performed numerous inspections of 200+ feet high earth embankment dams for dam owner; prepared inspection reports; accompanied consulting engineer, State Division of Safety of Dams (DSOD) and FERC inspections. Owner's non-emergency point-of-contact with DSOD and FERC.

- Co-edited 2013 Nacimiento Dam Emergency Action Plan update. Prepared and presented Nacimiento Dam 2013 Emergency Action Plan orientation to dam owner engineering and operations personnel. Prepared 2011 Nacimiento Dam Functional Exercise Report for submittal to FERC.

- Prepared dam surveillance and inspection scope of work for San Antonio Dam, review consulting engineer's work and recommend approval of final reports; issue request for proposals for dam surveillance and inspection, interview candidates and select consultant.

- Co-managed contract for repair of Nacimiento hydroelectric plant, including refurbishing of generator, replacement of main shaft bearings, wicket gate repair, wear ring replacement, hydraulic system repair, plant start-up and commissioning.

- Salinas River Diversion Facility (SRDF) – Project Manager of the SRDF, inflatable dam, surface water intake, 36 cfs pump station and pipeline project to divert surface water from the Salinas River for irrigation of Salinas Valley farmland. Assisted development environmental compliance documents, including complex river flow prescription for threatened steelhead trout; managed development of engineering design criteria, including coordination with State DSOD, coordinated agricultural growers, health agencies, water treatment personnel and microbiologists, regarding river water treatment and food safety issues resulting in chlorination of river water to be delivered for irrigation use; developed and supervised river water quality sampling program; developed and manage project budgets; procured and administered engineering consultant and construction contracts; supervised project value engineering effort; managed easement procurement and land acquisition; managed project regulatory compliance and communications with environmental agencies NMFS, CDFG,

USFWS, USACE, CCRWQCB; assisted in project operating plan and budget; reported to Chief Engineer-O&M, General Manager, and Board of Directors. Managed emergency repair of erosion, including State DSOD submittals and compliance, design consultant and construction contractor.

- Castroville Seawater Intrusion Project (CSIP) – Field Engineer during construction of the irrigation distribution system consisting of 46 miles of buried pipeline, 112 farm turnouts, 21 groundwater wells, 3 booster pump stations, cathodic protection system, and SCADA system. Represented project owner during the two-year construction period, coordinating activities with construction manager, design engineers, landowners, agricultural growers, and electric utility company. Assisted in financing acquisition for the project, working with financial advisor, bond counsel and County finance officers to execute sale of municipal bonds, and federal and state loan acquisition.

- Marina Deep Monitoring Well Project – Project Manager of 2,000 feet deep-aquifer multiple-completion monitoring well project in Marina, CA for the Marina Coast Water District. Developed and managed project scope and budget; acquired permits; solicited and hired consulting hydrogeologist and driller; coordinated construction activities with neighboring commercial operations; developed monitoring plan and performed initial monitoring.

- De Dampierre River Bank Restoration Project, Carmel River – Project Manager for river bank flood damage bank stabilization and riprap placement work under 1995 Federal and State emergency restoration programs; coordinated funding from Federal, State and local sources; administered construction contract; administered compliance with Federal NRCS and State OES.

- All Saints River Bank Restoration Project, Carmel River – Project Manager for river bank flood damage bank stabilization and riprap placement work under 1995 Federal and State emergency restoration programs; coordinated funding from Federal, State and local sources; administered construction contract; administered compliance with Federal NRCS and State OES.

- Toro Creek Sediment Removal Project – Project Manager for stream sediment removal project under 1995 Federal and State emergency restoration programs; coordinated funding from Federal NRCS, State OES and local sources; liaison with adjacent condominium homeowners association and fire station; performed construction inspection; administered construction contract; administered compliance with to Federal and State agencies.

- Water Resources Data Collection – Technician; collected and processed for presentation and archival groundwater level data; measured stream flow in Salinas River and tributary; computed daily stream flow records.

- Soil and Water Conservation Project Design – Field Office Engineer (USDA Soil Conservation Service); designed earth embankment farm reservoirs, irrigation systems, surface water drainage systems, storm water detention basins, grade control structures for soil and water conservation purposes; developed design criteria with project owners; evaluated effectiveness of soil and water conservation projects.

Appendix 3

MCWRA Personnel Training Outline

1. Dam Safety Awareness: Emphasize the importance of dam safety; provide information on the major features of Nacimiento dam and how they function; describe the causes and consequences of dam failure. Provide an overview of the MCWRA Dam Safety Program. Discuss the reporting structure and the Chief Dam Safety Engineer function.
2. Identification of Visual Dam Deficiencies: Provide guidelines for visual detection of some of the more common dam deficiencies. Review the facility inspection plan and discuss individual responsibilities.
3. Inspection of Embankment Dams: Provide guidance on how to inspect the slopes, crest and adjacent areas of an embankment dam and on identifying deficiencies.
4. Instruments for Embankment Dams: Explain the purpose of any instrumentation and describe how the instruments work. Provide instruction on proper instrument reading and data recording. Review the installed facility instrumentation, what they monitor, and what instrument readings mean.
5. Emergency Action Plan and Dam Safety Refresher: Review of the EAP for the facility, with discussion of individual responsibilities. Reinforce dam safety awareness and present site specific issues.
6. Dam Safety Compliance Requirements: Review FERC safety compliance and reporting requirements.

Appendix 4

Safety Inspections

A. Agency Inspections - Nacimiento Dam receives daily inspection from the Reservoir Operator who lives at the Dam. Additional inspections are performed on an as-needed basis by Agency staff, including the Maintenance Superintendent, Associate Water Resources Engineer, and Chief Engineer of the Operations and Maintenance Division. Agency staff also performs at least two annual thorough inspections of all facilities along with inspectors from other agencies, as mentioned below. An annual settlement and shift survey is performed to assure that no unusual movement of the embankment occurs. All valves and equipment are tested annually and exercised.

B. Other Agency Inspections - Inspectors from the State Department of Water Resources, Division of Safety of Dams (DSOD), and the Federal Energy Regulatory Commission (FERC) perform separate annual inspections of all of the equipment and facilities of Nacimiento Dam with Agency staff.

C. Safety Inspection Report - Every five years the Agency hires an engineering consultant to provide an independent safety inspection report to the Agency and FERC. The report is performed according to FERC Part 12D guidelines and must meet FERC approval.

Before the Board of Directors of the Monterey County Water Resources Agency
County of Monterey, State of California

BOARD ORDER No. 14-27

ADOPT THE OWNER'S DAM SAFETY PROGRAM FOR NACIMIENTO DAM TO COMPLY WITH FEDERAL ENERGY REGULATORY COMMISSION REQUIREMENTS

Upon motion of Director Huerta, seconded by Director Scattini, and carried by those members present, the Board of Directors hereby:

1. Adopts the Owner's Dam Safety Program for Nacimiento Dam to Comply with Federal Energy Regulatory Commission Requirements

PASSED AND ADOPTED on this 28th day of April 2014, by the following vote, to-wit:

AYES: Directors Richard Ortiz, Claude Hoover, Ken Ekelund, David Hart, John Huerta, Mike Scattini and Deidre Sullivan

NOES: None

ABSENT: Directors Silvio Bernardi and Mark Gonzalez

BY: Richard Ortiz, Chair
Board of Directors

ATTEST: David E. Chardavoyne
General Manager

FEDERAL ENERGY REGULATORY COMMISSION
Office of Energy Projects
Division of Dam Safety and Inspections – San Francisco Regional Office
100 First Street, Suite 2300, San Francisco, CA 94105-3084
(415) 369-3300 Office (415) 369-3322 Facsimile

April 11, 2014

In reply refer to:
Project No. 6378-CA

Mr. Brent Buche
Chief of Operations and Maintenance
Monterey County Water Resources Agency
P.O. Box 930
Salinas, CA 93902-0930

Re: Owner's Dam Safety Program – Revision

Dear Mr. Buche:

This correspondence is in response to a letter dated February 26, 2014 from Mr. Chris Moss that transmitted MCWRA's revised Owner's Dam Safety Program (ODSP) for the Nacimiento Project, FERC Project No. 6378. The revised ODSP satisfactorily addressed the comments provided in our letter dated June 14, 2013. Thank you in advance for the implementation of and adherence to your ODSP.

If you have any questions, we are available for a face-to-face meeting, and I can be contacted at (415) 369-3318. We appreciate your cooperation in this aspect of the Commission's dam safety program.

Sincerely,

(For)Frank L. Blackett, P.E.
Regional Engineer

cc:
Mr. Chris Moss
Senior Water Resources Engineer
Monterey County Water Resources Agency
P.O. Box 930
Salinas, CA 93902-0930