Streambed Monitoring Below Englebright Dam Plan

Security Level: Public

Yuba River Development Project
FERC Project No. 2246

December 2014

Table of Contents

List of Figures

List of Tables

List of Attachments

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GLOSSARY - DEFINITION OF TERMS, ACRONYMS AND ABBREVIATIONS

Term	Definition
ac-ft	acre-feet
Cal Fish and Wildlife	California Department of Fish and Wildlife
cfs	cubic feet per second
CVRWQCB	Central Valley Regional Water Quality Control Board
CWA	Clean Water Act
Englebright Dam	A federal dam managed by the USACE dam on the Yuba River.
Englebright Reservoir	A federal reservoir on the Yuba River formed by Englebright Dam.
FERC or Commission	Federal Energy Regulatory Commission
ft	foot or feet
in.	inch
mi	mile
NMFS	United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service
PG&E	Pacific Gas and Electric Company
Plan	Streambed Monitoring Below Englebright Dam Plan
Project	Yuba River Development Project, FERC Project No. 2246
SWRCB	State Water Resources Control Board
USACE	United States Army Corps of Engineers
USFWS	United States Department of Interior, Fish and Wildlife Service
YCWA	Yuba County Water Agency
yd^3	cubic yard

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SECTION 1.0

INTRODUCTION

In a letter dated October 8, 2014, the Federal Energy Regulatory Commission's (FERC or Commission) Chief (Chief) of the Aquatic Resource Branch of the Division of Hydropower Administration and Compliance (DHAC) directed the Yuba County Water Agency (YCWA) to develop two plans to minimize the potential for adverse effects to the fishery in the Yuba River downstream of the United States Army Corps of Engineers' (USACE) Englebright Dam due to operations of YCWA's Narrows 2 Powerhouse, Narrows 2 Partial Bypass (Partial Bypass) and Narrows 2 Full Bypass (Full Bypass),[1] and to file the plans with FERC by January 6, 2015 for approval.

The Narrows 2 Facilities are part of YCWA's Yuba River Development Project, FERC Project Number 2246 (Project). The initial license for the Project was issued by the Federal Power Commission (FERC's predecessor) to YCWA on May 16, 1963, effective on May 1, 1963. The Federal Power Commission's May 6, 1966, Order Amending License changed the license's effective date to May 1, 1966, for a term ending on April 30, 2016.

In anticipation of the expiration of the initial license, on April 28, 2014, YCWA filed with FERC an Application for a New License Major Project – Existing Dam (Application for New License), which YCWA prepared in conformance with Title 18 of the Code of Federal Regulations (C.F.R.), Subchapter B (Regulations under the Federal Power Act), Part 5 (Integrated Licensing Process).

One of the plans required by the Chief in his October 8, 2014 letter is a *Streambed Monitoring Below Englebright Dam Plan* (Plan). Specifically, the Chief stated at pages 4 and 6 of his letter:

> In addition to developing a plan for one-time modification of the gravel bar,[2] the licensee must develop a long-term plan for *streambed monitoring below Englebright Dam*. It should include plans for monitoring and periodic reporting to the Commission on the reformation of the gravel bar and any other potential stranding locations between Englebright Dam and the Smartsville gage.[3] In addition, the plan should include contingency plans for streambed management to ensure that fish stranding depressions are prevented or removed. The plan should also include a provision for analyzing the potential for fish stranding in the large interstitial spaces along the stream margins after fish leaping, or

[1] For the purpose of this Plan, these three facilities are referred to collectively as the "Narrows 2 Facilities."

[2] The gravel bar referenced in the Chief's letter is the same gravel bar as described in YCWA's March 31 2014 letter filed with FERC. In that letter, YCWA reported to FERC an October 11, 2013 incident where fish were isolated in a small pool (i.e., "existing isolation pool") across from the Narrows 2 Powerhouse that was formed by the gravel bar. YCWA proposed to remove the existing isolation pool and grade the gravel bar, after obtaining the necessary permits and FERC's approval.

[3] For the purpose of this Plan, the "Smartsville gage" is the United States Geological Survey's (USGS) streamflow gage 11418000, *Yuba River Below Englebright Dam, Near Smartsville.*

> when flows recede. Finally, the plan should include an implementation schedule that will encompass the remaining period of the current project license and any subsequent annual operating licenses (if necessary). The plan should be developed in consultation with the resource agencies and filed with the Commission within 90 days of the date of this letter.
>
> We are not opposed to the licensee's plans to modify the gravel bar, downstream of the Narrows 2 powerhouse to prevent fish stranding. However, the licensee should first, consult with the resource agencies on its proposal, and obtain any necessary permits to perform this work. Following agency consultation, the licensee should file with the Commission Secretary, its final proposal and a request to begin work. The filing should include a description of the [sic] how the work will be performed, along with a copy of agency comments and permits, and its response to any comments received. [Emphasis added.]

This final *Streambed Monitoring Below Englebright Dam Plan* provides the information required by the Chief in his October 8, 2014 letter for one of the plans.[4]

YCWA coordinated the Plan development with Pacific Gas and Electric Company (PG&E). However, the Plan does not propose any changes to PG&E's Narrows Project license (FERC Project No. 1403). The Plan is filed with FERC by YCWA for its Yuba River Development Project.

YCWA provided a draft of the Plan to resource agencies and applicable stakeholders for a 30-day review and written comment period; and addressed in the Plan written comments received during the review period. If YCWA did not adopt a written comment, the reason it was not adopted is described in Attachment A to the Plan, which also includes consultation documentation.

1.1 Background

1.1.1 Yuba River Development Project

The Project is located in Yuba, Sierra and Nevada counties, California, on the main stems of the Yuba River, the North Yuba River and the Middle Yuba River, and on Oregon Creek, a tributary to the Middle Yuba River. Major Project facilities, which range in elevation from 280 feet (ft) to 2,049 ft, include: 1) New Bullards Bar Dam and Reservoir; 2) Our House and Log Cabin diversion dams; 3) Lohman Ridge and Camptonville diversion tunnels; 4) New Colgate and Narrows 2 power tunnels and penstocks; 5) New Colgate, New Bullards Minimum Flow and Narrows 2 powerhouses; and 6) appurtenant facilities and features (e.g., administrative buildings, switchyards, roads, trails and gages). The Project includes 16 developed recreation facilities

[4] YCWA will file the second plan, the *Narrows 2 Facilities Prioritized Operations and Monitoring Plan*, required by the Chief''s October 8, 2014 letter, with FERC under separate cover.

associated with the New Bullards Bar Reservoir. The existing Project does not include any aboveground open water conduits (e.g., canals or flumes) or any transmission lines.

Figure 1.1-1 shows the Project and the FERC Project Boundary.[5]

[5] The FERC Project Boundary is the area that YCWA uses for normal Project operations and maintenance. The boundary is shown in Exhibit G of YCWA's Application for New License and may be changed by FERC with cause from time to time during the term of a license.

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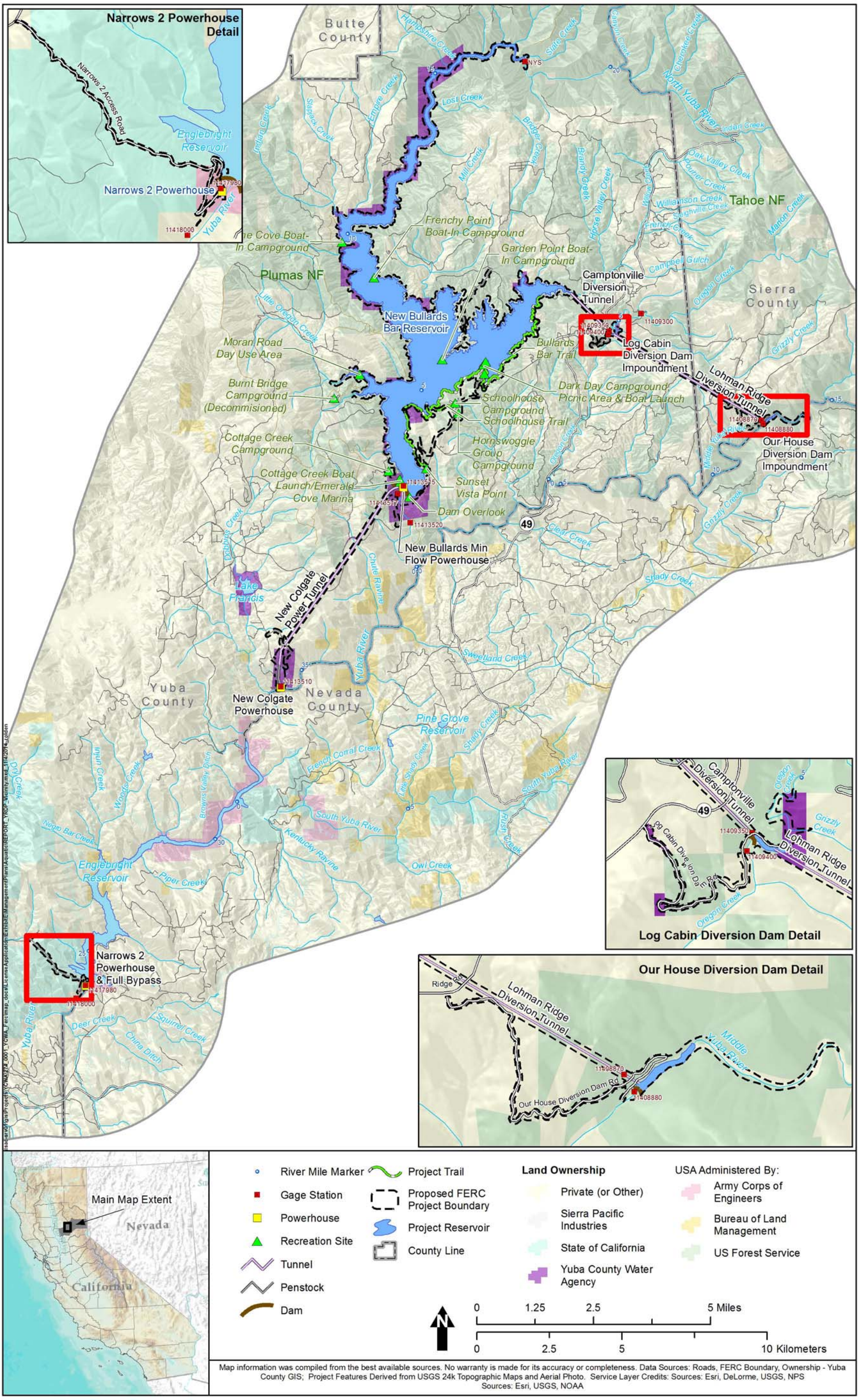

Figure 1.1-1. Yuba County Water Agency's Yuba River Development Project and vicinity.

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1.2 Purpose of the Streambed Monitoring Below Englebright Dam Plan

The purpose of this Plan, once approved by FERC and implemented, is to reduce the potential for adverse effects to the fishery in the Yuba River downstream of Englebright Dam due to fish stranding[6] related to operations (e.g., fish stranding might occur in association with flow reductions from the Narrows 2 Facilities) of the Narrows 2 Facilities. Refer to YCWA's March 31, 2014 letter to FERC for a detailed description of events known to YCWA.

YCWA will coordinate, to the extent appropriate, the efforts required under this Plan with other Project resource efforts, including other resource management plans, such as the *Narrows 2 Facilities Prioritized Operations and Monitoring Plan* once approved by FERC, and measures included in the existing FERC Project license.

1.3 Goals and Objectives of the Streambed Monitoring Below Englebright Dam Plan

The goal of the Plan is to provide the information required by the Chief in his October 8, 2014 letter. Specifically, this information includes:

- YCWA's plan for the removal of the existing isolation pool and the status of YCWA's efforts to obtain the necessary permits and approvals to remove the existing isolation pool.
- Monitoring and periodic reporting to the Commission on the reformation of the existing isolation pool and on any other potential fish stranding locations between Englebright Dam and the Smartsville gage.
- Contingency plans for streambed management to ensure that any future fish stranding depressions are prevented or removed.
- Provision for analyzing the potential for fish stranding in the large interstitial spaces along the stream margins after fish leaping or when discharges[7] from Narrows 2 Facilities recede.
- An implementation schedule for Plan activities encompassing the remaining period of the existing Project FERC license and any subsequent annual operating licenses for the Project.

[6] For the purpose of this Plan, a "stranded fish" is a fish found in the dry on the river bank or a gravel bar or in a wetted pool that is entirely isolated from the flowing river. A stranded fish can be either dead (i.e., a fish carcass) or alive.

[7] For the purpose of this Plan, "discharge" means the flow through a facility at a designated location in terms of cubic feet per second (cfs). A discharge may be measured or estimated, and may also be referred to as a "release."

1.4 Contents of the Streambed Monitoring Below Englebright Dam Plan

This Plan includes the following:

- Section 1.0. Introduction. This section includes introductory information, including a general description of the Project, and the purpose, goal and objectives and contents of the Plan.
- Section 2.0. Description of Reach Between Englebright Dam and Smartsville Gage. This section describes the Yuba River between Englebright Dam and the Smartsville gage. The section includes descriptions of facilities, hydrology, channel morphology and fishes in this section of the Yuba River.
- Section 3.0. Plan for Removal of Existing Isolation Pool and Status of Obtaining Permits and Approvals. This section describes YCWA's proposal to remove the existing isolation pool. The current status of YCWA's efforts to obtain the necessary permits and approvals to remove the existing isolation pool is provided.
- Section 4.0. Identification and Removal of Potential Fish Stranding Locations. This section describes YCWA's monitoring of the reformation of the gravel bar that forms the existing isolation pool and any other potential similar stranding locations between Englebright Dam and the Smartsville gage, and identification of large interstitial spaces along the river where stranded fish may be found after a fish leaps or when flows from the Narrows 2 Facilities recede. In addition, the section describes YCWA's contingency plan to ensure that fish stranding depressions are prevented, or removed once identified.
- Section 5.0. Reporting to FERC. This section includes a description of YCWA's reporting to FERC regarding the effectiveness of the Plan.
- Section 6.0. Implementation Schedule. This section provides a schedule for implementing the Plan.
- Section 7.0. References Cited. This section lists references cited in this Plan.

In addition, Attachment B to this Plan includes a compact disc (CD) that contains the hydrology information referenced in the Plan.

SECTION 2.0

DESCRIPTION OF REACH BETWEEN ENGLEBRIGHT DAM AND SMARTSVILLE GAGE

This section describes the approximately 2,250-foot (ft) long section of the Yuba River between Englebright Dam and the Smartsville gage (Reach).[8] Section 2.1 describes the six facilities in the Reach. Section 2.2 describes the overall hydrology in the Reach. Channel morphology is described in Section 2.3. Section 2.4 lists the fishes that may occur in the Reach.

YCWA does not own any of the land in the vicinity of the Narrows 2 Facilities. The USACE owns the land from upstream of the Narrows 1 Powerhouse to Englebright Dam, and the PG&E owns the land from the USACE-owned land downstream past the Smartsville gage[9] on the southern bank of the Yuba River, while approximately 41 acres of the land along the northern bank of the Yuba River is being conveyed from PG&E to the Regents of the University of California for the benefit of the Sierra Foothill Research Extension Center, with various rights and easements to PG&E and YCWA for use of an access trail and gaging station for hydroelectric purposes, and a permanent conservation easement to the Bear Yuba Land Trust.

The only vehicular access to the Reach is via the Narrows 2 Access Road that crosses private and federal land.

Figure 2.0-1 shows the Reach and the FERC Project Boundary near the Reach. The imagery in the figure was obtained by YCWA from Landiscor Aerial Information of Phoenix, AZ, and was taken in autumn 2008 at 1 ft by 1 ft horizontal resolution. It was provided in the horizontal datum NAD83, State Plane California Zone II projection using North American Vertical Datum of 1988 and units of US ft. The flow when the photo was taken was approximately 820 to 850 cfs as measured at the Smartsville gage.

[8] Many of the technical memoranda developed as part of the Project relicensing refer to the "Englebright Dam Reach," which is the 4,130-ft long section of the Yuba River from Englebright Dam to Deer Creek. The Reach discussed in this Plan is the uppermost 55 percent of the Englbright Dam Reach.

[9] Refer to Figure 2.0-1, Sheet 1 in Exhibit G of YCWA's Application for New License, which depicts land ownership in the vicinity of the Narrows 2 Facilities.

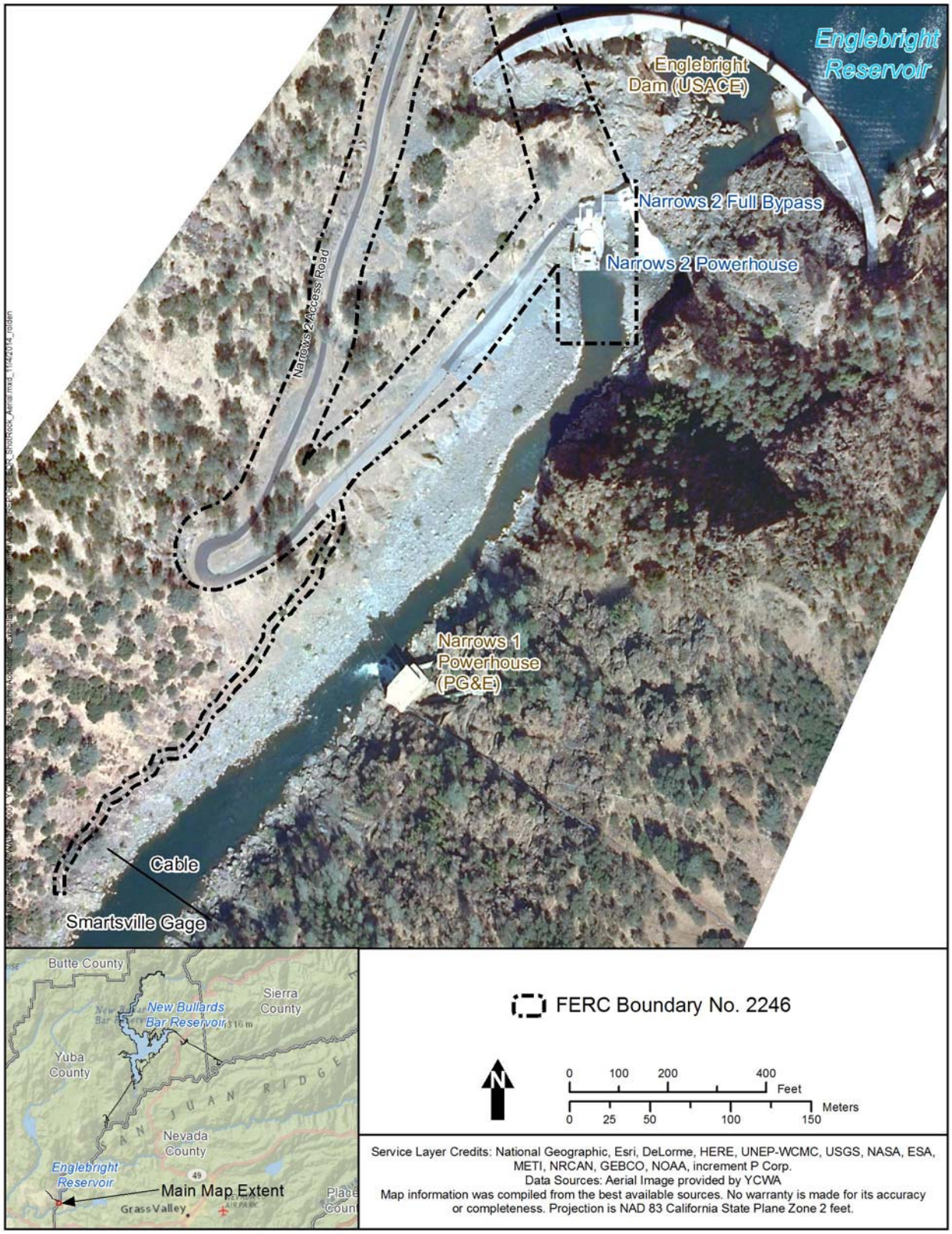

Figure 2.0-1. The Yuba River between Englebright Dam and the Smartsville Gage.

2.1 Facilities in the Reach

Six facilities, each of which is described below, are located within the Reach and are shown in Figure 2.0-1.

2.1.1 Englebright Dam

Englebright Dam, which is located at river mile (RM)[10] 24.3, was constructed by the California Debris Commission from 1939 to 1941 and is about 260 (ft) high. The dam does not include an outlet; when the capacity of the dam is exceeded, water spills over the dam. When the California Debris Commission was decommissioned in 1986, administration of Englebright Dam and Reservoir passed to the USACE, which now operates and maintains the dam, reservoir and associated recreation facilities. The primary purpose of the dam is to trap and contain sediment derived from extensive, historic hydraulic mining operations in the Yuba River watershed. Englebright Reservoir is about 9 miles (mi) long with a surface area of 815 acres (ac). When the dam was put into operation in 1941, it had a gross storage capacity of 70,000 acre-feet (ac-ft); however, due to sediment capture, the gross storage capacity today is approximately 50,000 ac-ft (USGS 2003). The dam does not include any fish passage facilities or associated programs. The dam is at the upstream terminus of the Reach.

2.1.2 Narrows 2 Powerhouse

The 46.75 megawatt (MW) Narrows 2 Powerhouse is an indoor powerhouse located on the north bank of the Yuba River about 540 ft downstream of Englebright Dam. The powerhouse, which was constructed in 1968 and 1969, consists of one vertical axis Francis turbine with a generating capacity of 55 MW. At a head of 236 ft (i.e., full head), the maximum discharge of the powerhouse is 3,400 cfs.

The powerhouse receives water from Englebright Reservoir via flow from the Narrows 2 Powerhouse Tunnel and Penstock, which is composed of a tunnel that is 20 ft in diameter and concrete-lined in the upper 376 ft, and 14 ft in diameter and steel-lined for the final 371.5 ft, and passes under the north bank of the Yuba River, attached to the penstock, which has a maximum flow capacity of 3,400 cfs.

The penstock bifurcates upstream of the turbine's spiral case. One branch of the bifurcation conveys water to the Narrows 2 Powerhouse and Partial Bypass, and the other branch conveys water to the Full Bypass, each of which is described below. Releases from the powerhouse draft tube are subsurface from the downstream concrete face of the powerhouse.

[10] For the purpose of this Plan, river miles (RM) are measured from the downstream confluence of the Yuba River with the Feather River at RM 0.0 in an upstream direction.

2.1.3 Narrows 2 Partial Bypass

The Partial Bypass was constructed as part of and is enclosed within the Narrows 2 Powerhouse. It is a pipe off the Narrows 2 Powerhouse turbine's spiral case, and, at full head, can discharge up to 650 cfs into the Yuba River through a 36-inch (in) valve located on the downstream face of the powerhouse above the powerhouse draft tube outlet. Releases from the Partial Bypass are into the air.

2.1.4 Narrows 2 Full Bypass

The Full Bypass is a valve and penstock branch off the Narrows 2 Penstock, which, at full head, can discharge up to 3,000 cfs of water into the Yuba River through a 72-in. diameter fixed-cone valve in a concrete structure immediately upstream of the Narrows 2 Powerhouse. The Full Bypass was constructed in 2006 and began operations in January 2007. Releases from the Full Bypass are into the air.

2.1.5 Narrows 1 Powerhouse

The 13.5 MW Narrows 1 Powerhouse, part of the Narrows Project, is owned and operated by PG&E. The powerhouse is a one-unit facility commissioned on December 29, 1942, and is located on the south side of the Yuba River approximately 1,500 ft downstream of Englebright Dam. The powerhouse withdraws water from Englebright Reservoir through an intake on the south side of the reservoir, and, at full head, has a maximum flow capacity of 730 cfs. The FERC license for PG&E's Narrows Project expires in January 2023.

2.1.6 Smartsville Gage

The Smartsville gage, which is located approximately 2,250 ft downstream from Englebright Dam, is owned and operated by PG&E with data provided to and reported by USGS. The gage has been used to monitor flow in the Yuba River since at least November 8, 1941. The gage includes a metal shelter on the north bank that houses the gaging equipment, a 140-ft long bubbler line enclosed in 1.5-in. galvanized steel conduit from the shelter into the gage pool, and a cable way. In the pool, both pressure, which is used to calculate stage, and water temperature are measured once every 15 minutes. Data are published by the USGS. The gage cable way is the downstream terminus of the Reach.

2.2 Reach Hydrology

2.2.1 Flows

From November 8, 1941 through September 30, 2014, the mean daily flow at the Smartsville gage, as measured at the gage, was 2,410 cfs. The maximum mean daily flow and instantaneous flow were 134,000 cfs recorded on January 2, 1997 and 171,000 cfs recorded on December 22,

1964, respectively. The 1.5-year reoccurrence peak mean daily flow and peak instantaneous flow were 6,983 cfs and 21,970 cfs, respectively.

On average, since the Project began operations in 1969, Englebright Dam has spilled[11] every 1.3 years (i.e., in 34 out of 44 years), with an average duration of 44 days. Spills have occurred mostly in March (26 years), followed by February (20), January (19), May (17), June (15), April (14) and July (4). Spills during the period have not occurred in August, September and October. The maximum number of spill-days in a year is 182 in Water Year (WY) 1983.

Figures 2.2-1 through 2.2-4 provide monthly flow exceedance plots for the Smartsville gage from WYs 1942 through 2014.

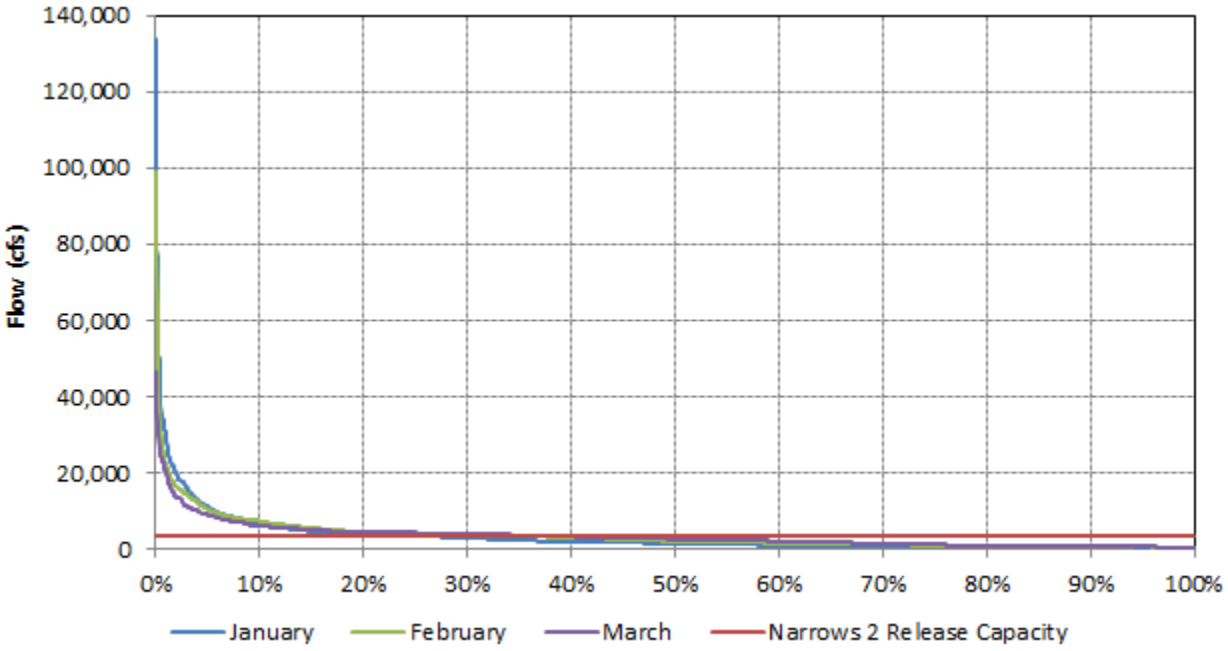

Figure 2.2-1. January, February and March exceedance probabilities of historical mean daily flow in the Yuba River at Smartsville Gage from WY 1942 through WY 2014.

[11] For the purpose of this Plan, a "spill" is assumed to occur whenever the mean daily flow at the Smartsville gage exceeded 4,130 cfs, which is the combined maximum flow of the Narrows 2 Facilities (3,400 cfs) and the Narrows 1 Powerhouse (730 cfs). This is a conservative approach because spills may have occurred when Smartsville gage flows were less than 4,130 cfs if either the Narrows 2 Facilities or the Narrows 1 Powerhouse was not operating at full capacity at the time the flow was recorded.

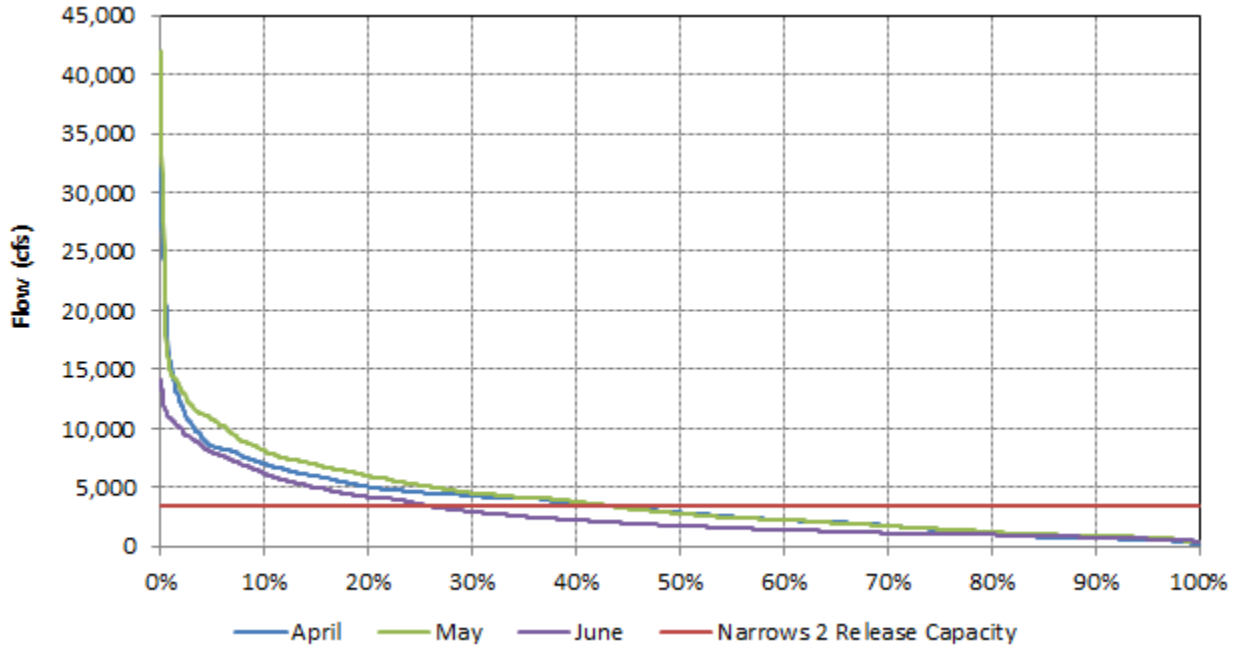

Figure 2.2-2. April, May and June exceedance probabilities of historical mean daily flow in the Yuba River at Smartsville Gage from WY 1942 through WY 2014.

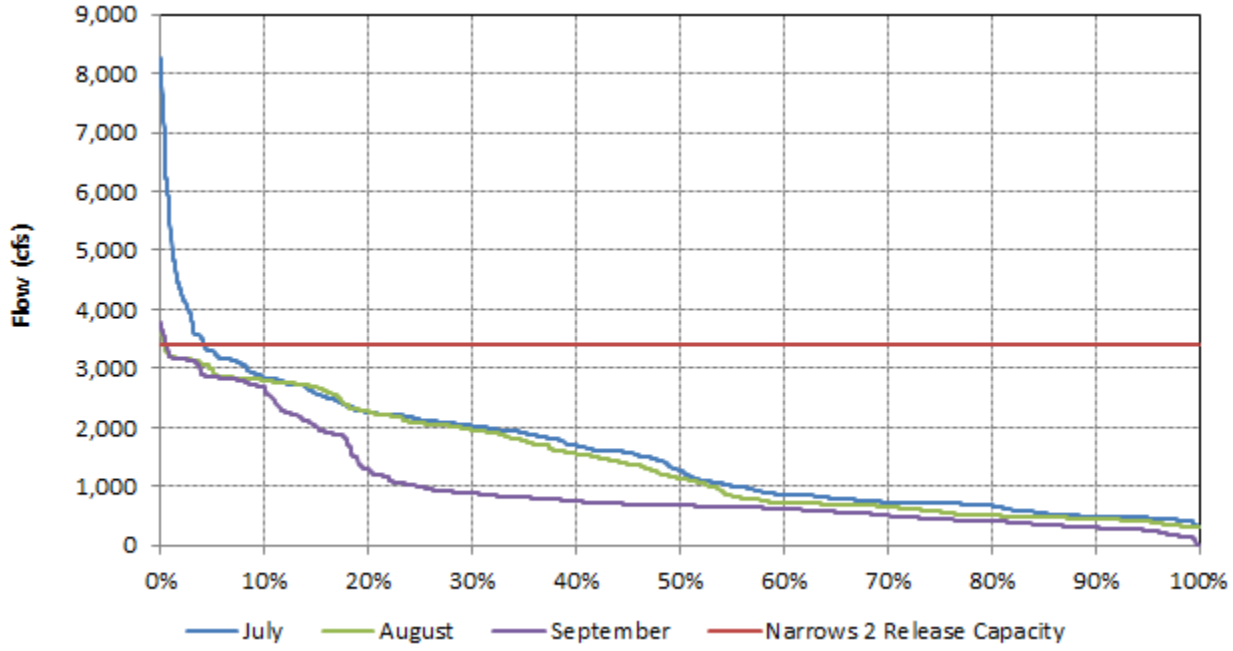

Figure 2.2-3. July, August and September exceedance probabilities of historical mean daily flow in the Yuba River at Smartsville Gage from WY 1942 through WY 2014.

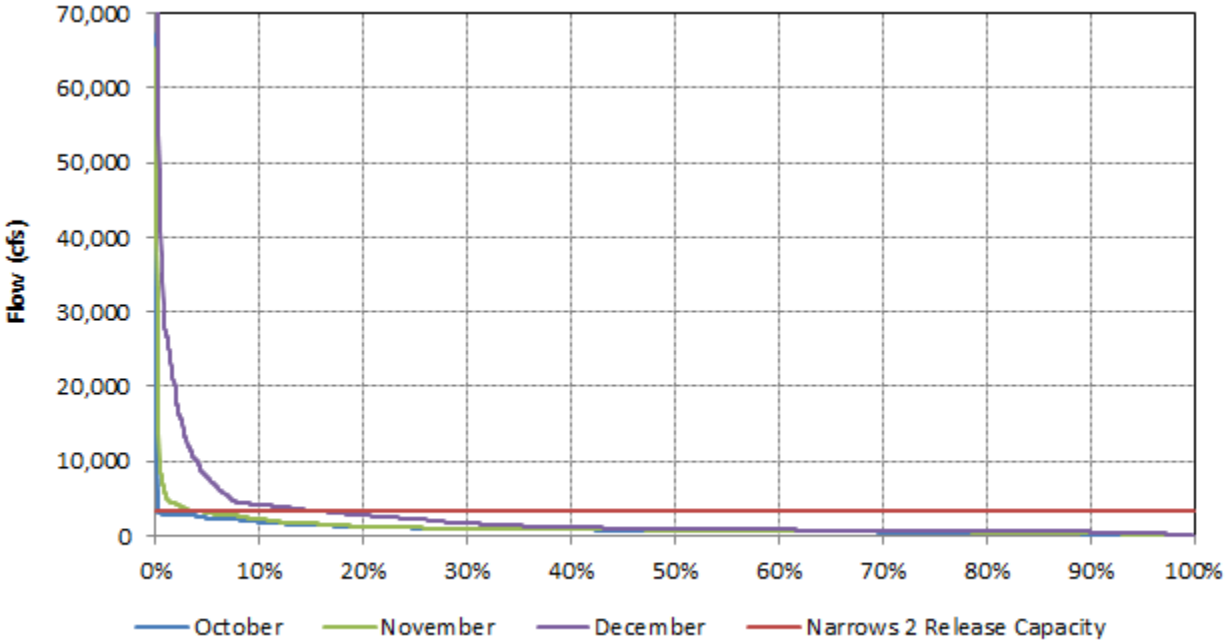

Figure 2.2-4. October, November and December exceedance probabilities of historical mean daily flow in the Yuba River at Smartsville Gage from WY 1942 through WY 2014.

YCWA developed similar hydrologic information, but for a shorter period (i.e., WY 1970 through WY 2011, which was the relicensing hydrologic period of record) during relicensing.[12]

Figure 2.2-5 through Figure 2.2-12 show estimated 15-minute discharges through the Narrows 2 Powerhouse, Partial Bypass, Full Bypass and Narrows 1 Powerhouse; 15-minute flow at the Smartsville Gage; and spills at Englebright Dam from WY 2007, when the Full Bypass began operations, through WY 2014. Each WY is characterized as Critically Dry, Dry, Below Normal or Wet based on the Smartsville Index.[13, 14] Some considerations when viewing the figures are:

- Most of the flow changes between facilities occurred within relatively short periods of time, especially during spills at Englebright Dam. At other times, flows were relatively constant. Thus the figures are provided to give an overall view of facility operations.
- Englebright Dam was assumed to be spilling when the reservoir elevation exceeded the elevation of the dam spillway.
- When only one Narrows 2 Facility was operating, the Narrows 2 Penstock AVM measured the entire flow through the facility, including changes in rate of flow. However, when more than one Narrows 2 Facility was operating, the Narrows 2 Penstock

[12] Refer to YCWA's Technical Memorandum 2-1, *Hydrologic Alterations*, dated January 2014 and included in Appendix E7 in Exhibit E of YCWA's February 2014 Application for New License.
[13] The Smartsville Index is described in YCWA's Application for New License in Appendix E2 as part of Proposed Condition WR2.
[14] None of the WYs from 2007 through 2014 would be characterized as Above Normal based on the Smartsville Index.

AVM measured the combined flow through the facilities, and YCWA estimated the flow through each facility based on YCWA Operators' log books.

- The measured releases from the Narrows 2 Facilities and Narrows 1 Powerhouse may not always have equaled the measured flow at the Smartsville gage when Englebright Dam was not spilling because of gaging errors.
- The Smartsville gage includes flows from the Narrows 2 Facilities, Narrows 1 Powerhouse and Englebright Dam spills, and the flow is measured in 15-minute intervals.
- The Narrows 2 Penstock AVM can be used to examine the rate of change through the combined Narrows 2 Facilities or through one Narrows 2 Facility if it is the only one operating. But if more than one Narrows 2 Facility is operating at the same time, the rate of flow change, especially during start-up and shutdown, in each facility cannot be estimated, other than in qualitative terms using YCWA Operators' log books.

Figures 2.2-7 through 2.2-12 show that Narrows 2 and Narrows 1 powerhouses may operate at the same time. However, typically YCWA does not operate the Full Bypass when the Narrows 2 Powerhouse is operating, or the Full and Partial bypasses at the same time. However, these may be operated at the same time during brief flow transition[15] periods.

The figures also show that, in general, in Wet WYs, such as 2011, Narrows 1 Powerhouse operated at consistent rates. The 2009 WY, which was Dry, also was characterized by relatively steady operational conditions at Narrows 1 Powerhouse, but in the Below Normal WY 2010, operational conditions were more variable. Regardless of WY, Narrows 2 Powerhouse releases fluctuated with the upstream hydrograph, passing upstream flows, and changing flows during potential spill events, which were frequent in Wet WYs. In Dry WYs, Narrows 2 Powerhouse often did not operate for months at a time.[16] In WY 2014, a Critically Dry WY, required releases from Englebright Reservoir were just above the Narrows 1 Powerhouse release capacity, so only the Narrows 2 Powerhouse was operated for the majority of the year, and the Narrows 1 Powerhouse was only operated for periods when accretions to the Yuba River were such that the Narrows 1 Powerhouse release capacity was adequate to meet Yuba River required flows.

[15] For the purpose of this Plan, a "transition" or "change-over" refers to decreasing or increasing the discharge from one facility in coordination with decreasing or increasing the discharge in another facility.

[16] Normally, YCWA takes its annual outage of the Narrows 2 Powerhouse for 2 to 3 weeks in late August/September, and PG&E takes its annual outage of the Narrows 1 Powerhouse for 3 weeks in July. During these annual outages, routine maintenance occurs. The annual outage can be taken at other times of the year or be longer or shorter in duration.

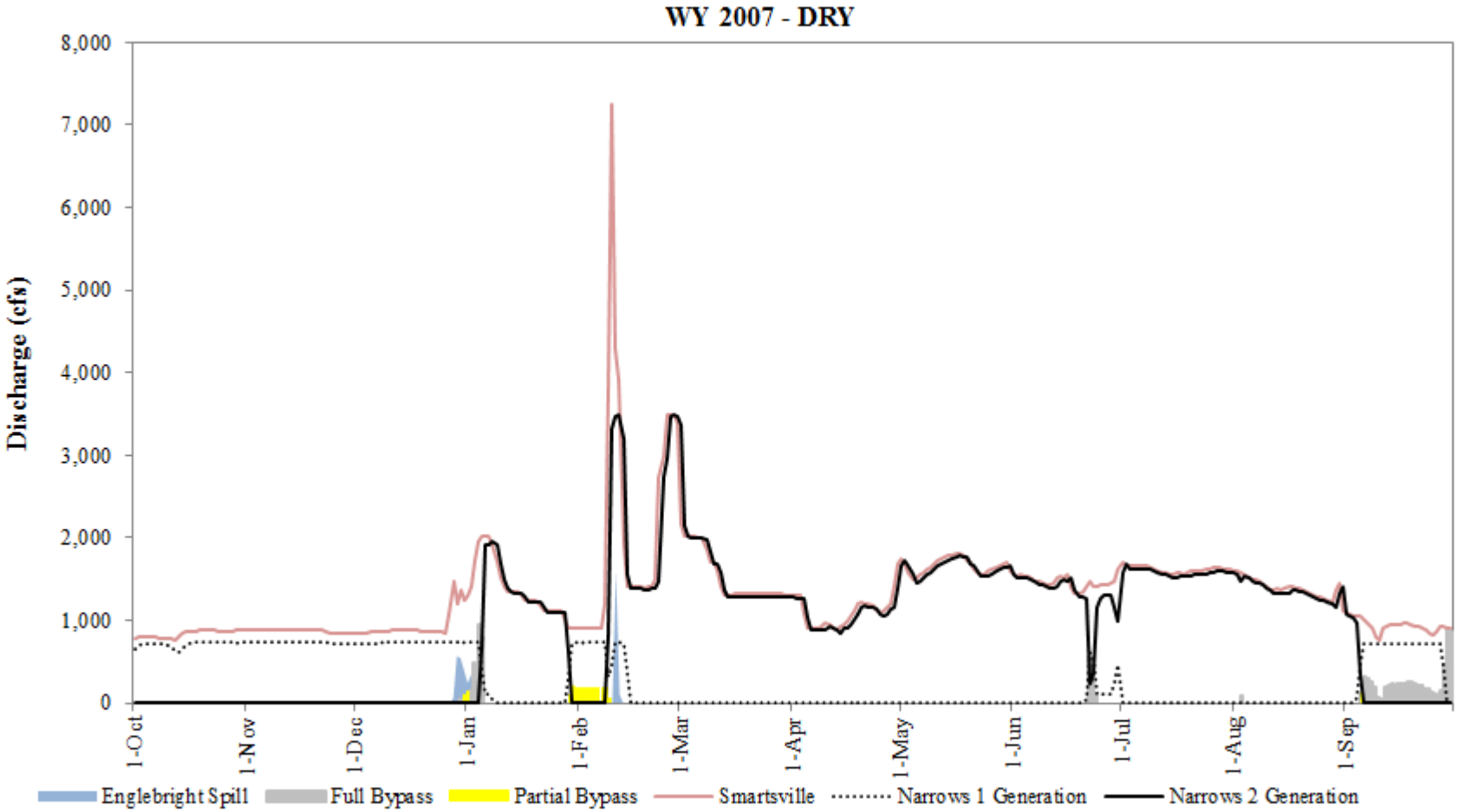

Figure 2.2-5. Mean daily discharges from Narrows 1 Powerhouse, Narrows 2 facilities, the Smartsville gage, and Englebright Dam spill in Water Year 2007.[17, 18]

[17] In this figure, Narrows 1 Powerhouse and Smartsville gage data are from PG&E, and the Partial and Full bypasses data are estimated by YCWA based on 15-minute flow data from the Narrows 2 Penstock AVM and information in YCWA Operators' log books.

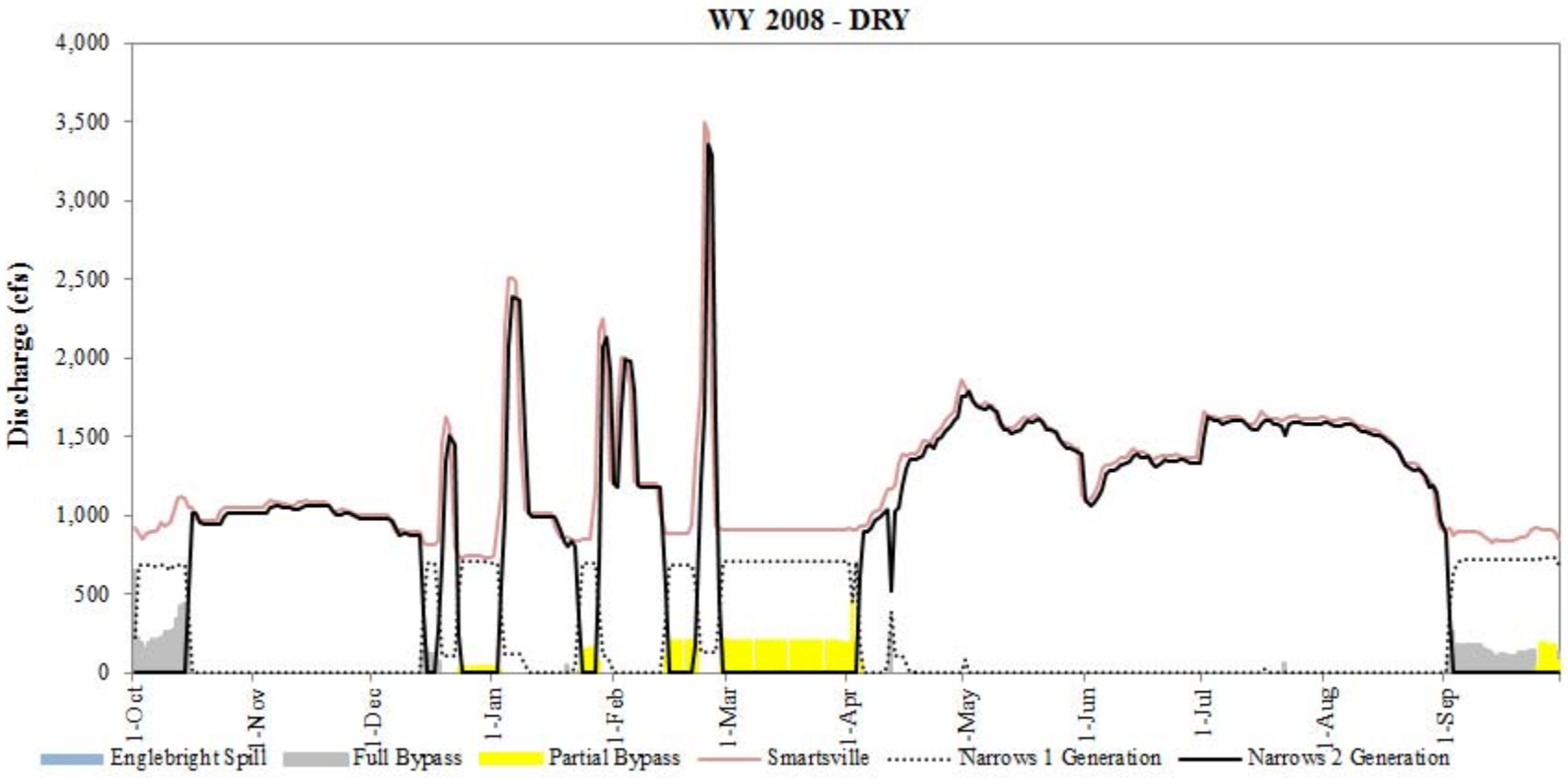

Figure 2.2-6. Mean daily discharges from Narrows 1 Powerhouse, Narrows 2 facilities, and the Smartsville gage in WY 2008. Englebright Dam did not spill in Water Year 2008.[19]

[18] The Narrows 2 Powerhouse was shut down during the period of October 1, 2006 through December 30, 2006 for the installation of the Full Bypass. Siphons over Englebright Dam were used to provide flow to the Yuba River in addition to Narrows 1 Powerhouse releases. Accordingly, there is a difference between the flow from the Narrows 1 Powerhouse and Smartsville gage flow shown in the figure.

[19] In this figure, Narrows 1 Powerhouse and Smartsville gage data are from PG&E, and the Partial and Full bypasses data are estimated by YCWA based on flow data from the Narrows 2 Penstock AVM and information in YCWA Operators' log books.

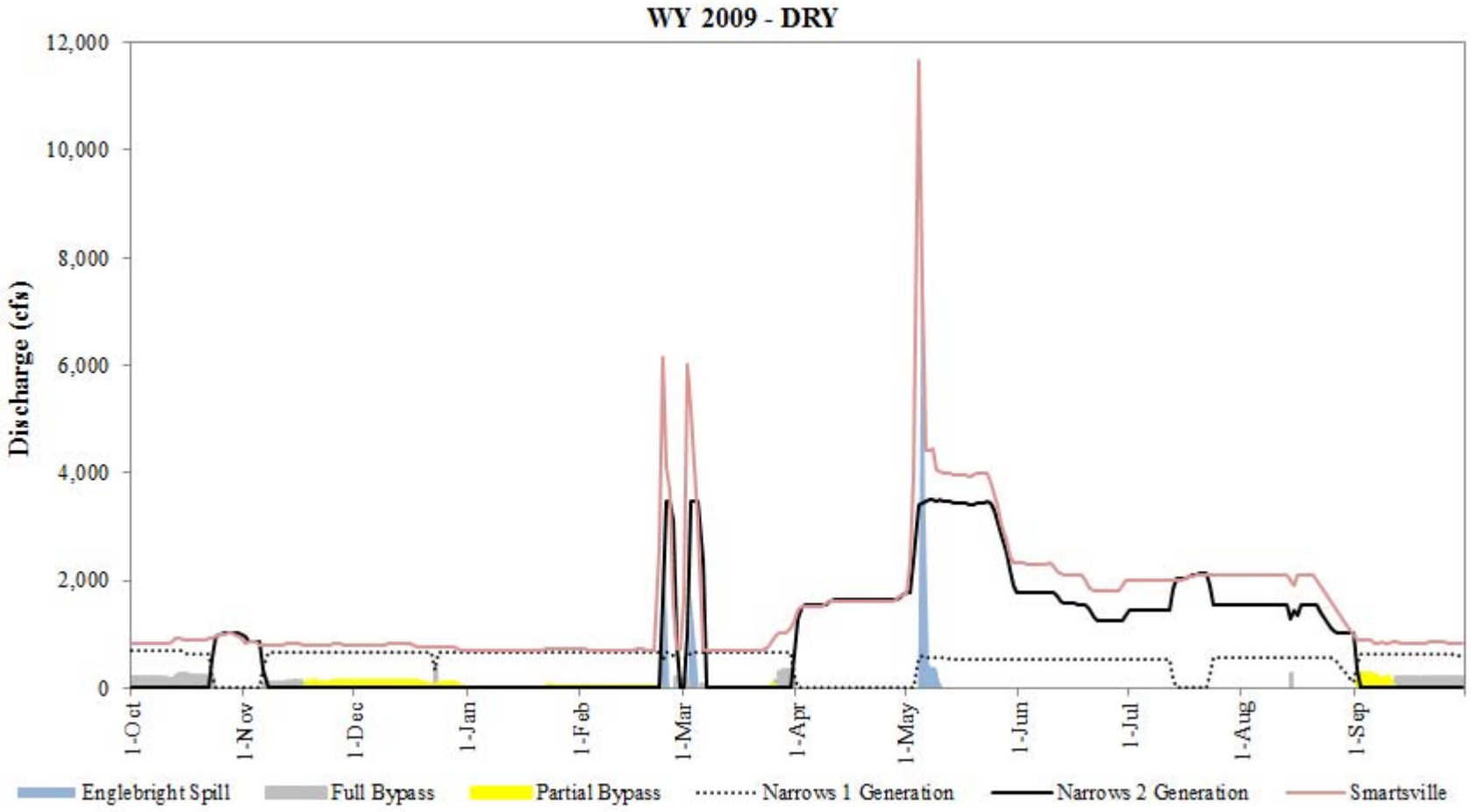

Figure 2.2-7. Mean daily discharges from Narrows 1 Powerhouse, Narrows 2 facilities, the Smartsville gage, and Englebright Dam spill in Water Year 2009.[20]

[20] In this figure, Narrows 1 Powerhouse and Smartsville gage data are from PG&E, and the Partial and Full bypasses data are estimated by YCWA based on flow data from the Narrows 2 Penstock AVM and information in YCWA Operators' log books.

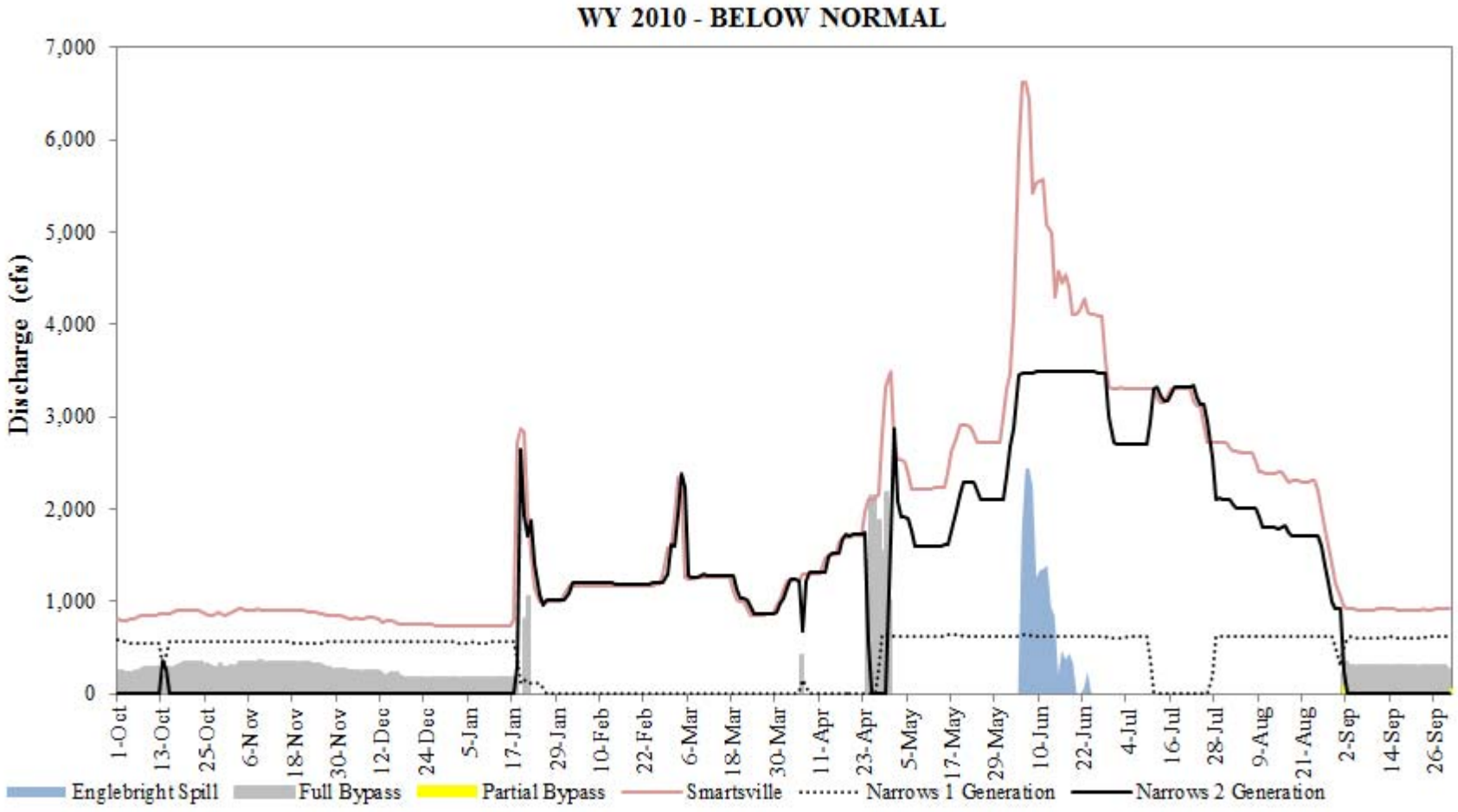

Figure 2.2-8. Mean daily discharges from Narrows 1 Powerhouse, Narrows 2 Facilities, the Smartsville gage, and Englebright Dam spill in Water Year 2010.[21]

[21] In this figure, Narrows 1 Powerhouse and Smartsville gage data are from PG&E, and the Partial and Full bypasses data are estimated by YCWA based on flow data from the Narrows 2 Penstock AVM and information in YCWA Operators' log books.

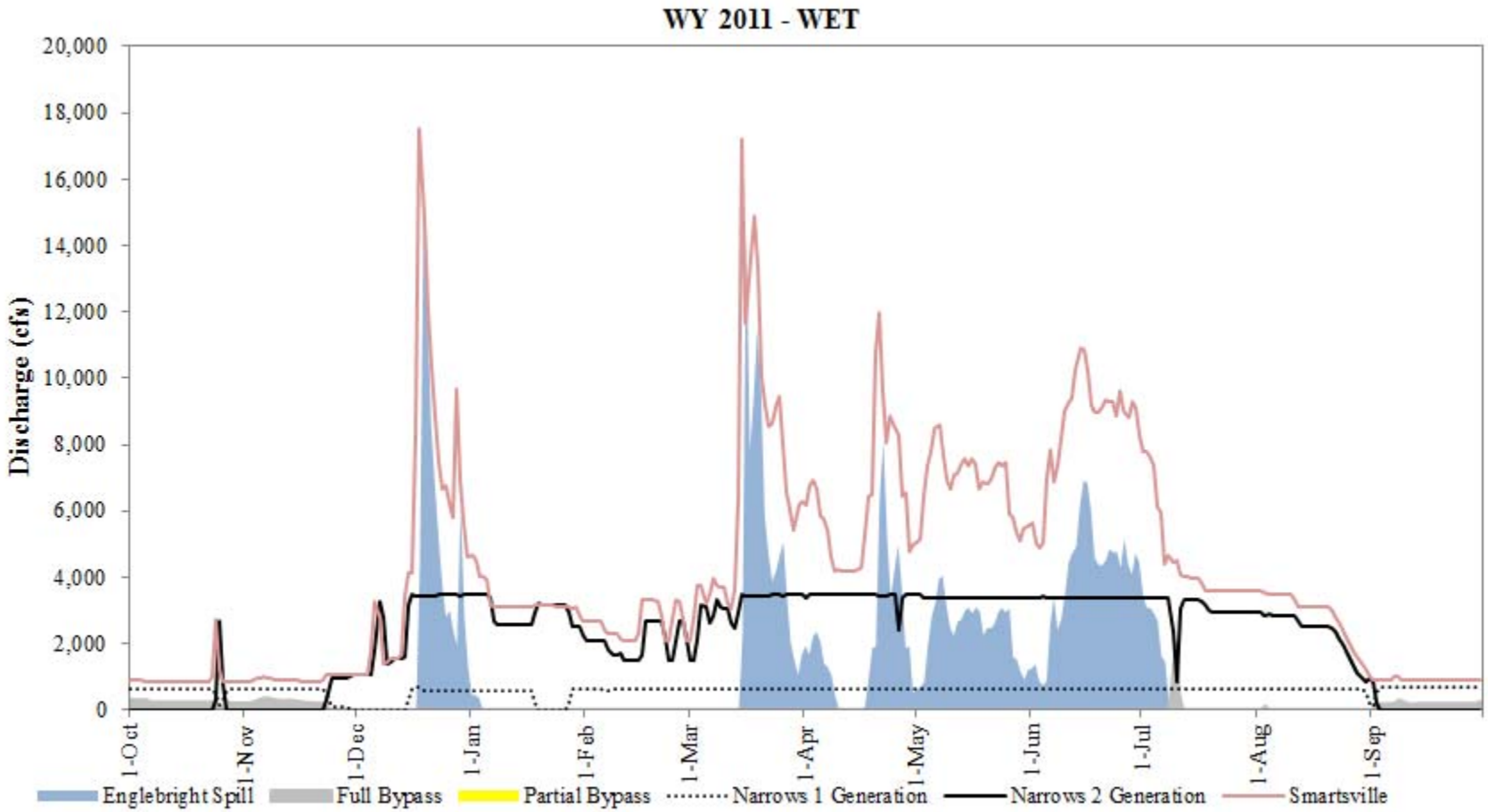

Figure 2.2-9. Mean daily discharges from Narrows 1 Powerhouse, Narrows 2 Facilities, the Smartsville gage, and Englebright Dam spill in Water Year 2011.[22]

[22] In this figure, Narrows 1 Powerhouse and Smartsville gage data are from PG&E, and the Partial and Full bypasses data are estimated by YCWA based on flow data from the Narrows 2 Penstock AVM and information in YCWA Operators' log books.

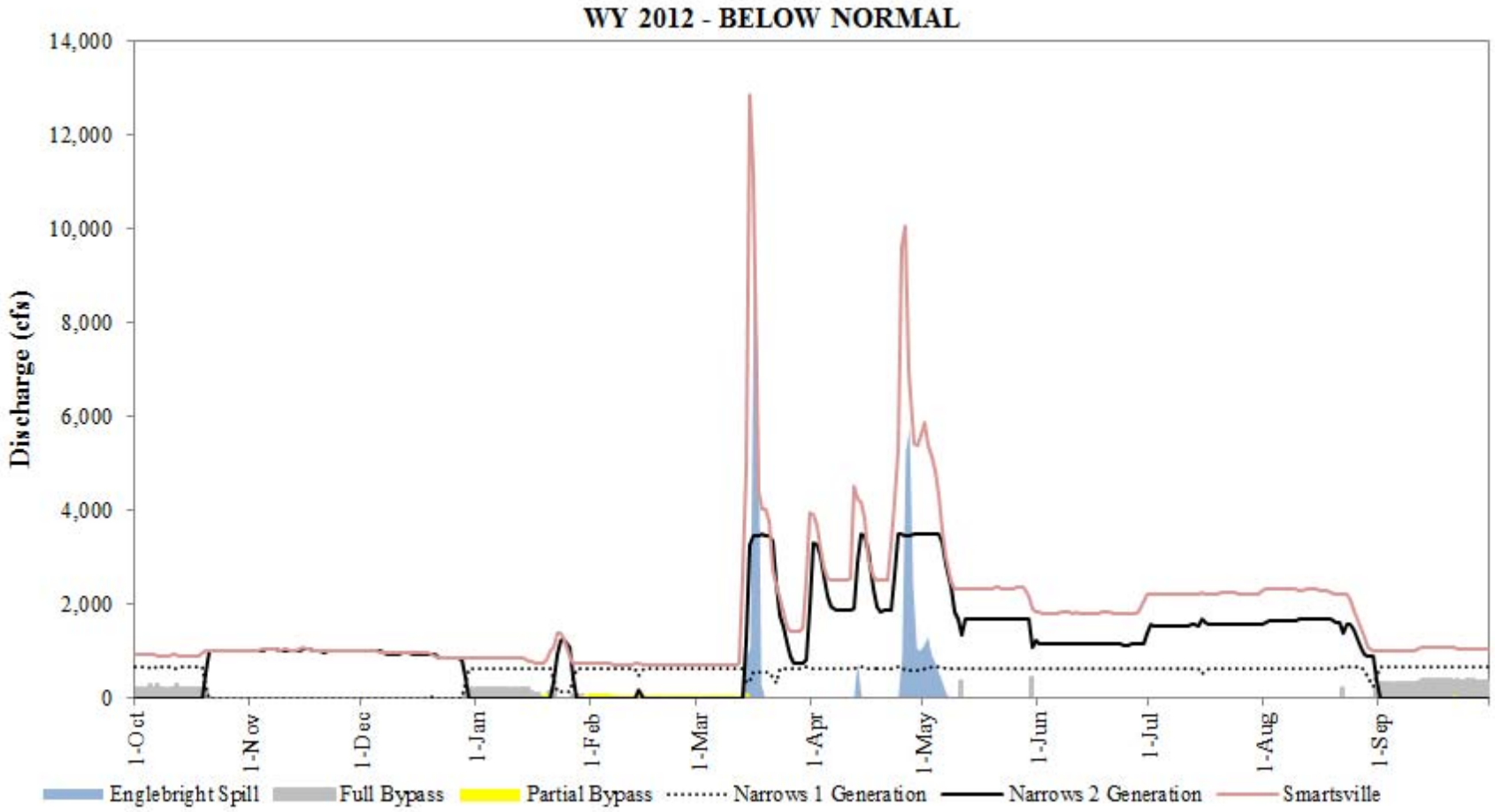

Figure 2.2-10. Mean daily discharges from Narrows 1 Powerhouse, Narrows 2 Facilities, the Smartsville gage, and Englebright Dam spill in Water Year 2012.[23]

[23] In this figure, Narrows 1 Powerhouse and Smartsville gage data are from PG&E, and the Partial and Full bypasses data are estimated by YCWA based on flow data from the Narrows 2 Penstock AVM and information in YCWA Operators' log books.

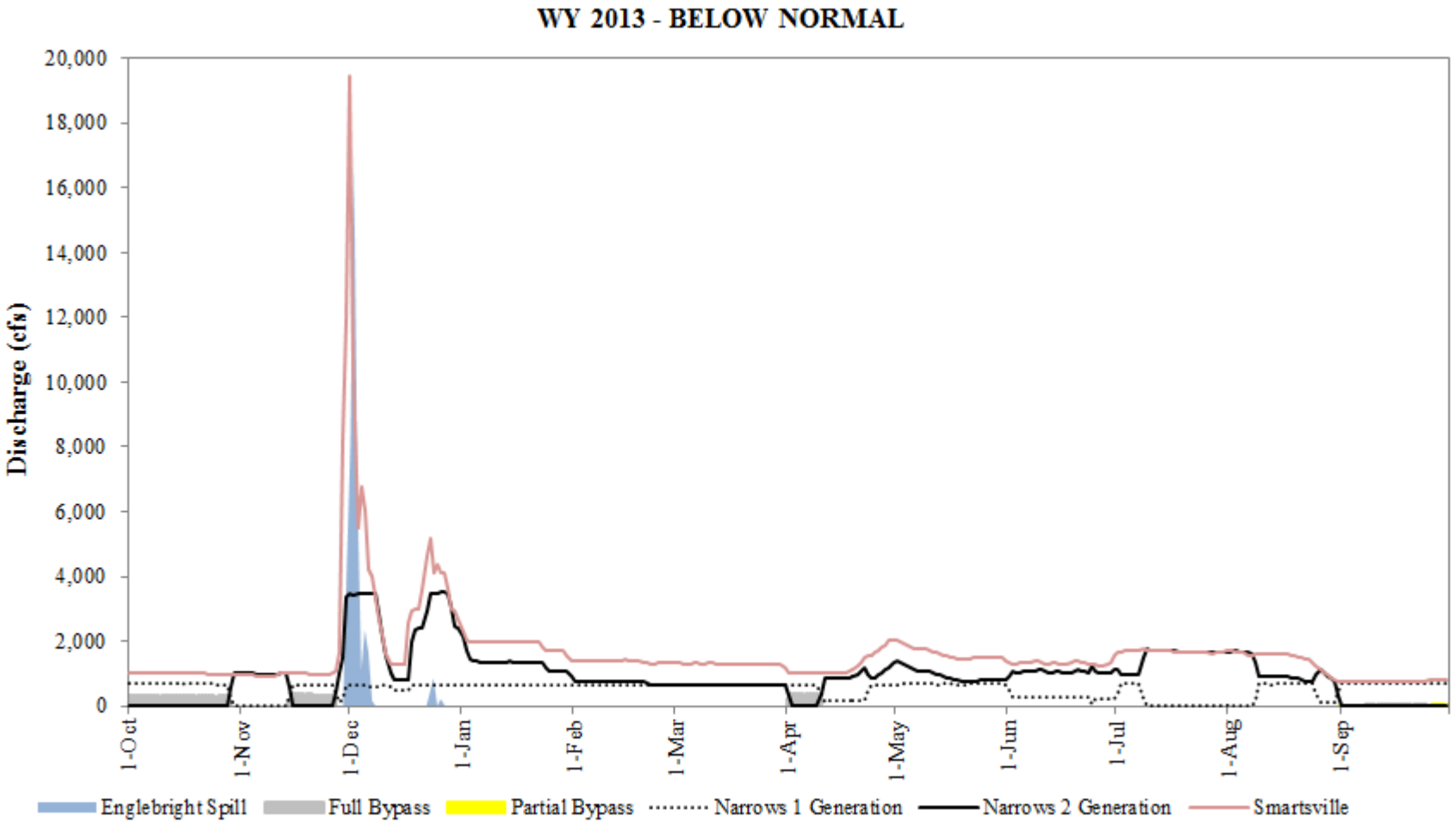

Figure 2.2-11. Mean daily discharges from Narrows 1 Powerhouse, Narrows 2 Facilities, the Smartsville gage, and Englebright Dam spill in Water Year 2013.[24]

[24] In this figure, Narrows 1 Powerhouse and Smartsville gage data are from PG&E, and the Partial and Full bypasses data are estimated by YCWA based on flow data from the Narrows 2 Penstock AVM and information in YCWA Operators' log books.

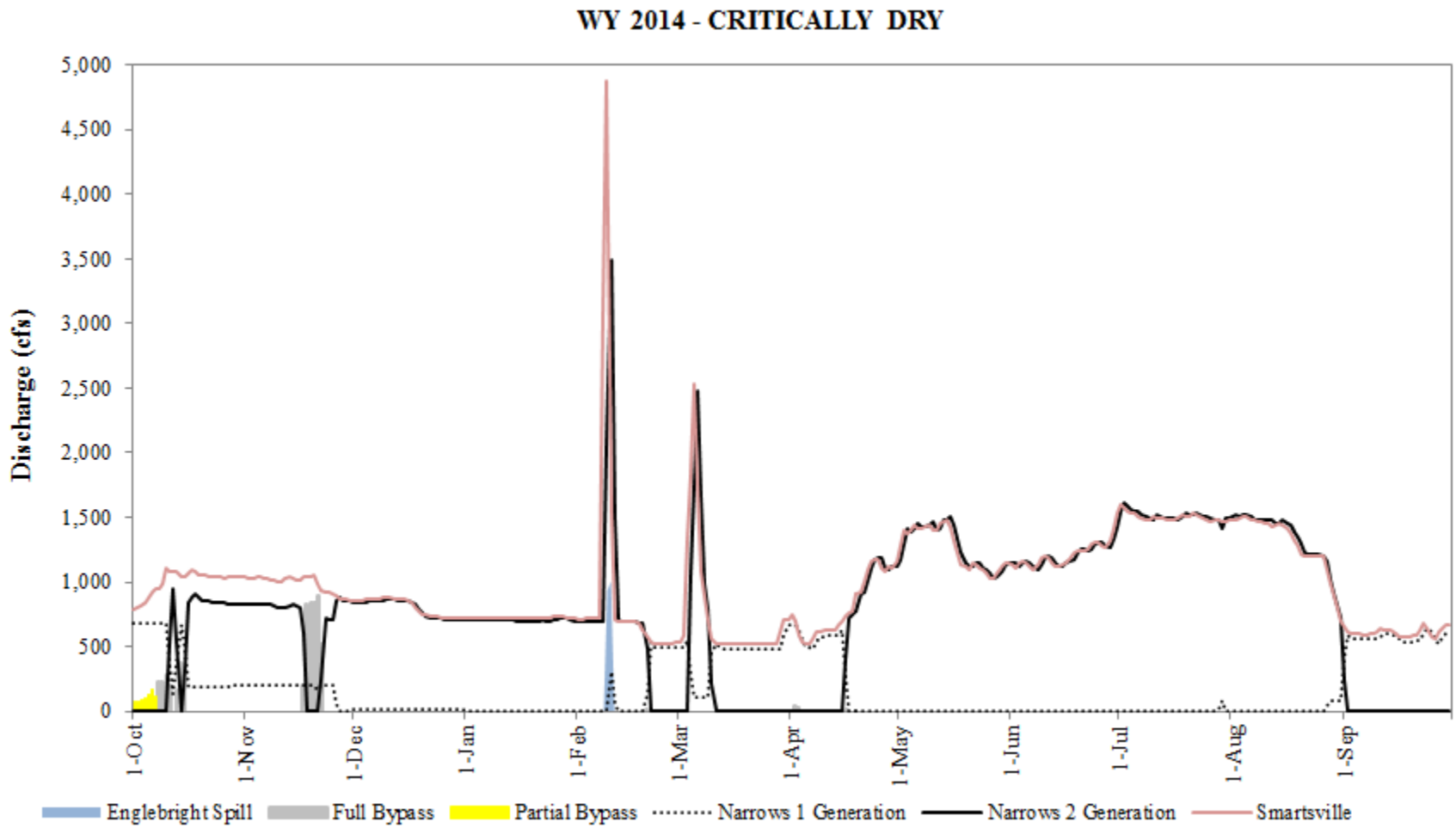

Figure 2.2-12. Mean daily discharges from Narrows 1 Powerhouse, Narrows 2 Facilities, the Smartsville gage, and Englebright Dam spill in Water Year 2014.[25]

[25] In this figure, Narrows 1 Powerhouse and Smartsville gage data are from PG&E, and the Partial and Full bypasses data are estimated by YCWA based on flow data from the Narrows 2 Penstock AVM and information in YCWA operators' log books.

2.3 Reach Channel Morphology

In general, the Reach can be divided into four general sections. The first section (i.e., Dam Pool) extends downstream approximately 385 ft from Englebright Dam to the Full Bypass. It includes a deep pool (i.e., ~30 ft deep) and a series of large boulders on the north side of the river that create a short riffle along the south side of the river. The second section (i.e., Bypass Pool) extends about 210 ft from the Dam Pool downstream to the upstream end of the Narrows 2 Powerhouse. It includes the existing isolation pool and a gravel bar along the south bank. The third section (i.e., Powerhouse Pool) extends from the Bypass Pool approximately 890 ft downstream to the Narrows 1 Powerhouse. This section includes a pool near the upstream end of the Reach and a long run. The fourth section (i.e., Narrows Riffle) extends approximately 765 ft from the Powerhouse Pool downstream to the Smartsville Gage cable way and includes a riffle and pool.

Assuming the channel morphology information developed by YCWA for the Englebright Dam Reach[26] is applicable to the Reach, the following generally describes some channel morphology characteristics in the Reach:

- The Reach has an average width of about 415 ft and a bed slope of approximately 0.31 percent (Table 3.1-2 in Tech Memo 1-2).
- The baseflow, bankfull and floodway channel widths are 120, 169 and 237 ft, respectively (Table 3.1-3 in Tech Memo 1-2).[27]
- The Reach may be classified as B2c using Rosgen (1996) classification. It has moderate entrenched ratio and width-to-depth ratios (i.e., 1.6 and 31, respectively), moderate sinuosity (i.e., >1.2); steeper bed slope (0.31%) and primarily boulder substrate (i.e., 298 millimeters [mm] in diameter). (Table 3.1-4 in Tech Memo 1-2.)
- The mean size of particles in the Reach is 298 mm, which is considered boulder size. By class, 62 percent of the substrate is boulder (i.e., 265 to 512 mm), 24 percent is large cobble (i.e., 128 to 256 mm), and 14 percent is cobble (i.e., 90 to 128 mm). Smaller-sized material may occur, but not in appreciable amounts. (Figure 3.2-10 in Tech Memo 1-2.)
- To produce even intermittent transport over 30 percent of the bed in the Reach, flows of 21,100 cfs or greater are needed. Even at flows of 110,400 cfs, channel altering occurs over only 8 percent of the bed. At a flow of 5,000 cfs, no transport occurs in 1 percent of the Reach, rare transport occurs in 93 percent of the Reach, and intermittent transport in 6 percent of the Reach. (Figure 3.3-22 in Tech Memo 1-2.)

With the exception of the channel below Narrows 1 Powerhouse, the Reach is exposed bedrock with alluvium composed mostly of angular-shaped pieces of rock from the underlying massive, solid bedrock. These angular pieces of rock originate from natural processes, such as erosion on

[26] Refer to YCWA's Technical Memorandum 1-2, *Channel Morphology Downstream of Englebright Dam*, dated June 2013 and included in Appendix E7 in Exhibit E of YCWA's February 2014 Application for New License.
[27] The baseflow, bankfull and floodway widths are based on discharges of 880, 5,000 and 21,100 cfs, respectively.

the Englebright Dam abutments during high flood flows, such as those in 1997, or large boulders smashing into the bedrock or other rocks during high flows; and man-made processes, such as mining or blasting related to historic hydraulic mining and construction of Englebright Dam, the Narrows 2 Facilities and Narrows 1 Powerhouse. These angular shaped rocks can be as small as a pea (i.e., ~2 to 32 millimeter [mm] in diameter) or as large as a truck.

The channel downstream of Narrows 1 Powerhouse includes approximately 6-mm to 127-mm sized gravel. In three years since 2008, USACE injected into this section approximately 5,000 short-tons of this sized gravel to enhance salmonid spawning.[28] YCWA understands that the USACE intends to continue this practice.

Figure 2.3-1 shows YCWA's good faith effort to characterize the major sedimentary zones in the Reach overlaid on the photo shown in Figure 2.0-1.[29] The figure provides a very broad description of the material, and should not be inferred to be precise or definitive. Mixtures of bedrock, angular rock and smooth river rock may occur anywhere in the Reach. The substrate characterizations in Figure 2.3-1 are described in Table 2.3-1.

[28] In a 2007 pilot program, the USACE injected about 500 short-tons of substrate into the river immediately below the Narrows 2 Powerhouse. All subsequent injections have been downstream of Narrows 1 Powerhouse.

[29] YCWA did not attempt to characterize the inundated areas in Figure 2.3-1 between Narrows 2 and Narrows 1 powerhouses, though YCWA's best estimate based on recent relicensing underwater investigations, the areas shown submerged at the approximately 820-850 cfs flow when the photo was taken is mostly exposed bedrock with scattered boulder and cobble angular rock, some in denser pockets.

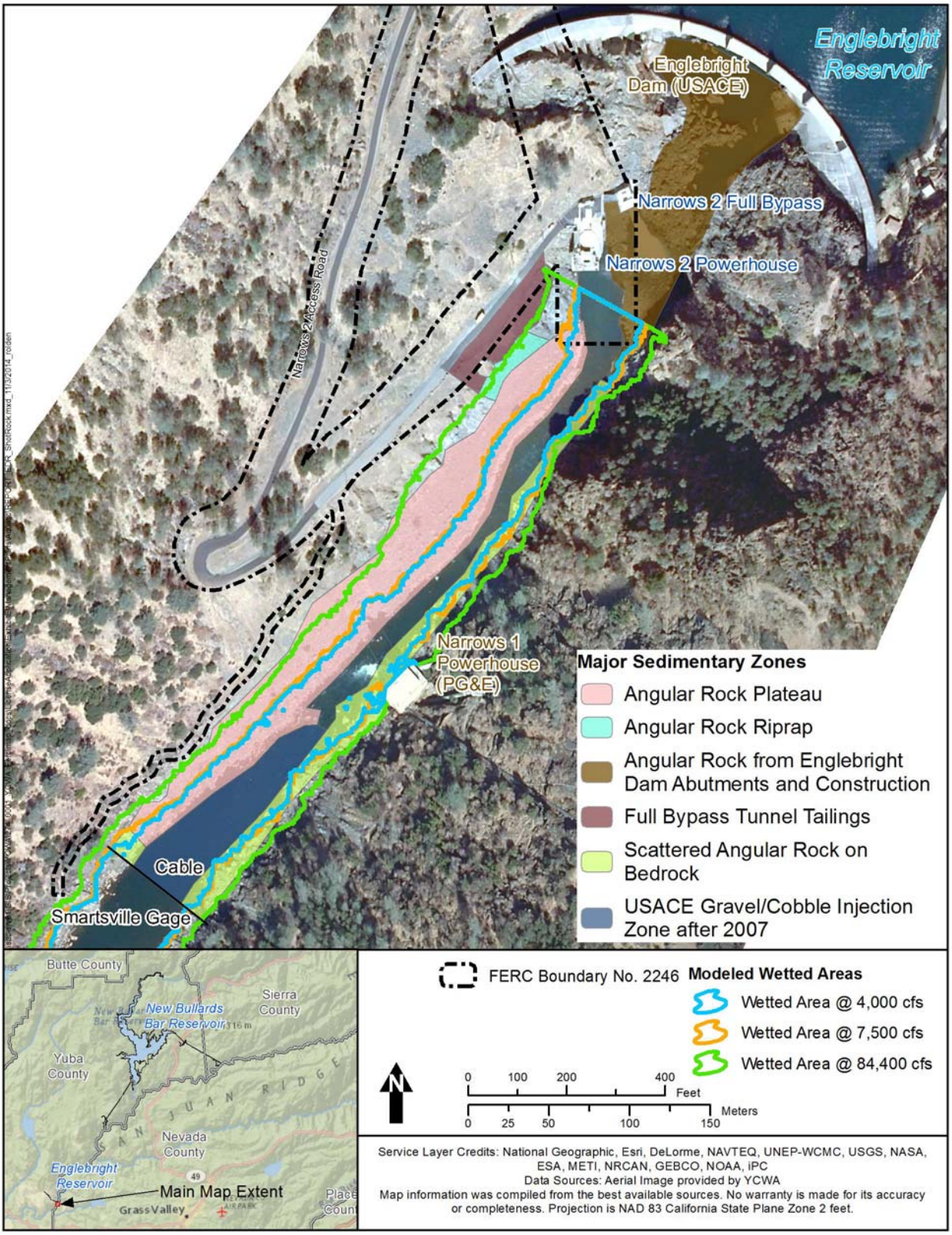

Figure 2.3-1. YCWA's good faith effort to characterize the major sedimentary zones in the Reach.

Table 2.3-1. Description of major sedimentary zones shown in Figure 2.3-1.

Zone	Description
Angular Rock Plateau	This is a single, long, relatively flat area on the north side of the Reach, which is composed mostly of boulder- and cobble-sized angular rock.
Angular Rock from Englebright Dam Abutments and Construction	This is primarily large angular boulders and cobble that are near Englebright Dam and resulted from construction of the dam and erosion, especially in 1997, when Englebright Dam was overtopped and flow eroded some of the downstream abutments.
Scattered Angular Rock on Bedrock	This occurs along much of the south side of the Reach and at the downstream end of the north side, and is characterized by exposed bedrock with a scattered veneer of large angular boulders and cobble.
USACE Gravel/Cobble Injection Zone after 2007	Since 2007, USACE has injected approximately 5,000 short-tons of gravel into the river three times to enhance salmonid spawning. USACE may continue this practice in the future.
Full Bypass Tunnel Tailings	In 2006, YCWA placed tailings from the Full Bypass construction along the north bank near the powerhouse to create a larger, safer parking area. The tailings are relatively high in the channel.
Angular Rock Riprap	As part of placing the Full Bypass tailings, YCWA took large angular rock from the channel and placed them along the toe of the slope to stabilize the slope.

Figure 2.3-1 also shows three inundation zones that were simulated using the Sedimentation and River Hydraulics–2D, Version 2.1 (SRH2D v2.1), which was developed and used during relicensing.[30] The inundation zones are for: 1) 4,000 cfs, which is the nearest simulated flow to 3,400 cfs, the maximum discharge capacity of the Narrows 2 Facilities; 2) 7,500 cfs, which is the nearest simulated flow to 6,983 cfs, the 1.5 year mean daily flow reoccurrence interval; and 3) 84,400 cfs, which is the nearest simulated flow to 66,210 cfs, the 10-year mean daily flow reoccurrence interval. Based on the Smartsville gage, mean daily flows of 4,000, 7,500 and 84,400 cfs were exceeded on a daily basis in 16, 5 and 0.03 percent of days for the period, and for at least one day per water year in 84, 66, and 7 percent of years for the 73-year period, respectively.

Table 2.3-2 shows the amount of each major sedimentary zone shown in Figure 2.3-1 that would be inundated at flows of 4,000, 7,500 and 84,400 cfs.

Table 2.3-2. Amount of each major sedimentary zone shown in Figure 2.3-1 that would be inundated at flows of 4,000, 7,500 and 84,400 cfs.

Zone	4,000 cfs		7,500 cfs		84,400 cfs	
	Plan View Area (sq ft)	Percent of Plan View Area[1] (%)	Plan View Area (sq ft)	Percent of Plan View Area (%)	Plan View Area (sq ft)	Percent of Plan View Area (sq ft)
Angular Rock Plateau	59,180	39%	69,765	46%	141,235	93%
USACE Gravel/Cobble Injection Zone after 2007	41,659	100%	41,696	100%	41,697	100%
Scattered Angular Rock on Bedrock	28,153	49%	34,095	59%	56,460	98%
Angular Rock Riprap	--	--	--	--	4,785	82%
Full Bypass Tunnel Tailings	--	--	--	--	1,025	5%
Angular Rock from Englebright Dam Abutments and Construction	Not Modeled	--	Not Modeled	--	Not Modeled	--
Total	**131,644**	--	**148,871**	--	**249,270**	--

[1] The percent of the plan view area for the specific substrate zone shown in Figure 2.3-1.

[30] Refer to YCWA's Technical Memorandum 7-10, *Instream Flow Downstream of Englebright Dam*, dated September 2013 and included in Appendix E7 in Exhibit E of YCWA's February 2014 Application for New License, for a full description of the SRH2D v2.1 Model.

2.4 Fishes in the Reach

Nine fishes have been documented to occur in the Yuba River between RM 22 and Englebright Dam. These include two non-native species (green sunfish [*Lepomis cyanellus*] and striped bass [*Morone saxatilis*]) and four native species (Sacramento sucker [*Catostomus occidentalis occidentalis*], hardhead [*Mylopharodon conocephalus*], Sacramento pikeminnow [*Ptychocheilus grandis*] and rainbow trout, the non-anadromous form of *Oncorhynchus mykiss*. Also included are the native anadromous Central Valley steelhead Distinct Population Segment, or DPS (*O. mykiss*); Central Valley spring-run Chinook salmon Evolutionary Significant Unit, or ESU (*O. tshawytscha*) and Central Valley fall-run Chinook salmon (*O. tshawytscha*). The spring-run Chinook salmon ESU and the Central Valley steelhead DPS are listed as threatened under the Endangered Species Act, and the spring-run Chinook salmon ESU is listed as threatened under the California Endangered Species Act. Fall-run Chinook salmon is listed as a Species of Concern by the United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS). Hardhead is listed as a Species of Special Concern by the California Department of Fish and Wildlife (Cal Fish and Wildlife).[31]

[31] Refer to YCWA's Technical Memorandum 3-9, *Non-ESA Listed Fish Populations Downstream of Englebright Dam*, dated December 2012 and included in Appendix E7 in Exhibit E of YCWA's February 2014 Application for New License, for a full description of these fishes, their geographic distribution and relative abundance.

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SECTION 3.0

PLAN FOR REMOVAL OF EXISTING ISOLATION POOL AND STATUS OF OBTAINING PERMITS AND APPROVALS

In a March 31, 2014 letter, YCWA reported to FERC an October 11, 2013 incident in which fish were stranded in the existing isolation pool across from the Narrows 2 Powerhouse. YCWA proposed removing the pool and grading of the adjacent gravel bar (i.e., the work). This section describes the work as proposed by YCWA and the status of YCWA's efforts in obtaining the necessary permits and approvals to perform the work.

3.1 Proposed Work

In anticipation of FERC's approval of its proposal and the work occurring in late September/early October 2014, in early August 2014 YCWA applied for the necessary permits and approvals to perform that work. The work, as currently proposed, would occur on the gravel rock bar (i.e., the bar) that forms the existing isolation pool. The work consists of placing two mini-excavators on the bar, which has an area of about 3,200 square ft, via helicopter, and moving some larger cobble and boulders on the bar into the existing isolation pool depression, which will be dry at the time. The material in the bar is composed of larger rocks ranging from approximately 4 to 10 ft in diameter at the upstream end of the bar to rocks ranging from 0.5 to 4 ft in diameter in the center and downstream end of the bar. The purpose of placing the larger material in the pool depression is to assure the pool depression does not reform at this location. Then, the mini-excavators will grade the bar downward from the existing isolation pool to the downstream water's edge at the time the work is performed so no other isolation pools occur on the bar. YCWA estimates that up to approximately 9,600 cubic ft of rock will be moved. A small boat or an inflatable kayak will be used for staff to access the dry bar and transfer any miscellaneous tools or materials (e.g., straw bales) each day from the north bank, where the Narrows 2 Powerhouse access road is located. YCWA anticipates that the work will take 1 to 3 days to complete.

During the work, no material will be removed from the streambed, and no fill will be added to the streambed. No structures (e.g., rip-rap or culverts) will be placed, built, or completed in or near the river. Water will not be directed or drafted for the purpose of the work (i.e., YCWA intends to perform the work opportunistically when the bar and existing isolation pool depression are dry). Therefore, the work does not include fish rescue. Figures 3.1-1 and 3.1-2, which were taken on September 1, 2014, show the dry bar and dry existing isolation pool depression.

Figure 3.1-1. Picture of dry gravel bar on which the work would occur. The photo was taken during a Narrows 2 outage when no flow was being released from the Narrows 2 Facilities.[32]

Figure 3.1-2. Picture of dry existing isolation pool depression on which the work would occur. The photo was taken during a Narrows 2 outage when no flow was being released from the Narrows 2 Facilities [33]

[32] The photo was taken from the Narrows 2 Powerhouse deck looking south across the Yuba River. The dry existing isolation pool depression shown in Figure 3.1-2 is the small discolored area at the center of the figure. As reference, the larger rocks at the upstream end of the bar (i.e., left end of the photo) ranges in size from about 4 to 10 ft in diameter. The majority of the rocks in the center and downstream end of the bar range in size from about 0.5 to 4 ft in diameter.

[33] The photo was taken from the bar shown in Figure 3.1-1 looking south. The depression on average is about 3 ft deep and 10 ft wide.

Conditions to perform the work may occur as early as December 2014, or at a later date. Therefore, YCWA has requested permits for the work that have a term of 5 years.

3.2 Approval and Permit Status

The status of each permit or approval for the work is described below.

- National Historic Preservation Act (NHPA) Section 106 Consultation. In a communication dated July 10, 2014, the State Historic Preservation Officer (SHPO) confirmed that NHPA Section 106 consultation for the work was not required. YCWA provided the letter to the USACE. YCWA requested comments from the United Auburn Indian Community of the Auburn Rancheria in a letter dated July 21, 2014. The Rancheria replied in a letter dated September 16, 2014, which did not include any specific comments regarding the work. No additional NHPA Section 106 consultation is required.
- Compliance with National Environmental Policy Act (NEPA). The USACE is the lead agency for NEPA compliance, and advised YCWA it expects to perform the NEPA analysis for the work as part of its Clean Water Act (CWA) Section 404 Permit.
- Compliance with California Environmental Quality Act (CEQA): On August 8, 2014, YCWA's Board adopted a CEQA Notice of Exemption for the work. The CEQA process addressed all aspects of the work. No additional CEQA work by YCWA is required. On October 24, 2014, Cal Fish and Wildlife advised YCWA that it too would prepare a CEQA document for the work.
- California Fish and Game Code (F.G.C.) Section 1602 Lake and Streambed Alteration Agreement. On August 7, 2014, YCWA filed with Cal Fish and Wildlife an application for a Section 1602 Agreement to perform the work in October 2014. In a letter dated August 26, 2014, Cal Fish and Wildlife notified YCWA that it considered YCWA's application incomplete. After meeting with Cal Fish and Wildlife staff, on October 27, 2014, YCWA submitted the additional requested information to Cal Fish and Wildlife and amended its Notification. On October 31, 2014, Cal Fish and Wildlife advised YCWA that its Notification was complete. Cal Fish and Wildlife issued to YCWA a draft Section 1602 Agreement for signature on November 8, 2014.
- USACE Clean Water Act (CWA) Section 404 Dredge and Fill Permit. On August 7, 2014, YCWA submitted to the USACE an application for a CWA Section 404 General Permit to perform the work. On August 21, 2014, YCWA advised the USACE that, because issuance of a Cal Fish and Wildlife Section 1602 Agreement was in doubt, YCWA now intended to perform the work in 2015. On October 31, 2014, YCWA advised the USACE that Cal Fish and Wildlife had accepted YCWA's Notification, and the work could now occur as early as December 2014, and requested the USACE expedite issuance of the Section 404 permit.
- SWRCB CWA Section 401 Water Quality Certificate. On August 7, 2014, YCWA submitted to the SWRCB an application for a CWA Section 401 Water Quality Certificate to perform the work. On August 22, 2014, YCWA advised the SWRCB that,

because issuance of a Cal Fish and Wildlife Section 1602 Agreement was in doubt, YCWA now intended to perform the work in 2015. On October 31, 2014, YCWA advised the SWRCB that Cal Fish and Wildlife had accepted YCWA's Notification, and the work could now occur as early as December 2014, and requested the SWRCB expedite issuance of the Section 401 permit.

As directed in the Chief's October 8, 2014 letter, when YCWA has obtained all necessary permits and approvals to perform the work, YCWA will file with FERC a letter describing the work and with copies of all necessary agency approvals and permits, including the CWA Section 401 and Section 404 permits, and will request FERC's approval for YCWA to perform the work.

SECTION 4.0

IDENTIFICATION AND REMOVAL OF POTENTIAL FISH STRANDING LOCATIONS

This section provides YCWA's approach to the identification, monitoring removal of potential fish stranding locations. This approach relies on the fish stranding monitoring that will occur as part of YCWA's *Narrows 2 Facilities Prioritized Operations and Monitoring Plan*, which was filed with FERC for approval under separate cover. Under that plan, YCWA will monitor for fish stranding immediately after use of the Full Bypass and Partial Bypass and after certain combined releases of the Narrows 2 Facilities that result in specified minimum stage reductions over a 1-hour period. The monitoring will occur until a new Project license is issued or FERC amends the plan. It is the intent of the monitoring to identify stranding locations associated with operations of the Narrows 2 Facilities.

4.1 Identification of Potential Fish Stranding Locations

4.1.1 Reformation of Existing Isolation Pool

Once FERC approves the work to remove the existing isolation pool and YCWA has completed the work, YCWA will document by a series of photographs the final configuration of the gravel bar that formed the pool, including the area where the pool had been located. The photos will be taken from standard locations, including: 1) from the downstream end of the bar looking upstream; 2) from the upstream end of the bar looking downstream; 3) from the Narrows 2 Powerhouse deck looking across the river at the bar (i.e. similar to the photo in Figure 3.1-1); and 4) at the restored area where the pool had been. A reference (e.g., meter stick) will be included in each photo for indication of size. Each photo point will be monumented for consistency of photos and coordinates will be saved using a survey-grade Global Positioning System (GPS) instrument. In addition, careful notes will be included to ensure the closest repetition of photos from photo period to photo period. YCWA will record the flow at the Smartsville gage and the releases from each Narrows 2 Facility at the time each photo is taken.

Then, during each annual outage of the Narrows 2 Facilities, which usually occurs in the late September to early October period, YCWA will retake the above photos to document any changes in the bar and restored pool area. At the same time, YCWA will examine the location where the isolation pool had been located for indications that the pool is reforming (e.g., noticeable depressions).

YCWA will also examine the river bank above the pool for any indications that the Full Bypass is eroding large angular rock from the bank.

The results of this monitoring, with a history of use of the Full Bypass (i.e., 15-minute discharge) in that calendar year will be reported to FERC, as described in Section 5.0.

Note that, as included in the *Narrows 2 Facilities Prioritized Operations and Monitoring Plan,* whenever the Full Bypass is used, YCWA will monitor for related fish stranding. During this monitoring, particular attention will be paid to the location of the existing isolation pool, and after the pool is removed, to the same location to confirm the restoration was effective.

4.1.2 Identification of Other Potential Isolation Pool Locations

At this time, YCWA is unaware of any potential isolation pools similar to the existing one. If in the course of the fish stranding monitoring described in the *Narrows 2 Facilities Prioritized Operations and Monitoring Plan* YCWA identifies any similar pools, YCWA will document their location, including GPS location and photos, area, depth, and substrate. YCWA will pay particular attention to these locations during subsequent fish stranding monitoring.

If other potential isolation pools are identified as described above, they will reported to FERC, as described in Section 5.0.

4.1.3 Potential for Fish Stranding in Large Interstitial Spaces Along River Margin

At this time, YCWA is unaware of any specific large interstitial spaces along the river margin that provide a unique potential for fish stranding related to operations of the Narrows 2 Facilities. A fish carcass was found on the north river bank downstream of the Narrows 2 Powerhouse on October 7, 2013, but YCWA does not consider the specific interstitial space in which the fish was found to offer a unique potential for fish stranding (i.e., no different than the many other interstitial spaces along the river margin and no other stranded fish have been found in this location). Therefore, if in the course of the fish stranding monitoring described in the *Narrows 2 Facilities Prioritized Operations and Monitoring Plan* YCWA identifies any specific large interstitial spaces or groups of large interstitial spaces, in which fish stranding is found, YCWA will document their location, including GPS location and photos, area, depth, and substrate. YCWA will pay particular attention to these large interstitial spaces during subsequent fish stranding monitoring.

If any large interstitial spaces are identified as described above, they will be reported to FERC, as described in Section 5.0.

4.2 Prevention and Removal of Fish Stranding Depressions

If the above monitoring, or the monitoring that will occur in association with the *Narrows 2 Facilities Prioritized Operations and Monitoring Plan,* identifies any isolation pools, large interstitial spaces along the river bank or other depressions where fish stranding due to operations of the Narrows 2 Facilities occurs or has a high likelihood to occur, YCWA will consult with NMFS, the United Stated Department of Interior, Fish and Wildlife Service (USFWS), USACE, Cal Fish and Wildlife and SWRCB to determine the appropriate course of action. Depending on specific conditions, the actions could include filing in depressions with rock either in the dry or wet, grading gravel bars or removing rock, and placing shotcrete (either

dry-or wet-mixed). YCWA will file with FERC the results of the consultation, including documentation and the proposed action and a schedule. Upon the Commission's approval of the proposed action, YCWA will obtain the necessary permits and approvals to perform the action, file those permits and approvals with FERC, and implement the action when approved by FERC.

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SECTION 5.0

REPORTING TO FERC

By January 15 of each year from the time the Commission approves this Plan until the a new license becomes effective for the Project, unless otherwise approved by the Commission, YCWA will file with the Commission a letter report summarizing the results of YCWA's activities under this Plan in the previous calendar year. The letter report will include the status of any YCWA proposed remedial actions, as described in Section 4.2 of this Plan.

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SECTION 6.0

IMPLEMENTATION SCHEDULE

YCWA will perform the work for the bar and existing isolation pool upon FERC approval.

YCWA will implement the monitoring and reporting described in Sections 4.0 and 5.0, respectively, upon Commission approval of this Plan and will continue implementing the monitoring and reporting until such time as otherwise authorized by the Commission or until a new license is issued, whichever occurs first.

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SECTION 7.0

REFERENCES CITED

United States Army Corps of Engineers (USACE). 2009. Department of the Army. Regional General Permit Number 60 for Repair and Protection Activities in Emergency Situations. Available online: <http://www.spk.usace.army.mil/Missions/Regulatory/Permitting/RegionalandProgrammaticGeneralPermits.aspx>. Sacramento, California.

United States Geological Survey (USGS). 2003. Open-File Report 03-383. Bathymetric and Geophysical Surveys of Englebright Lake, Yuba-Nevada Counties, California, 2003.

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Streambed Monitoring Below Englebright Dam Plan

Attachment A

Consultation Documentation

Yuba River Development Project

FERC Project No. 2246

December 2014

From:	Lynch, Jim
Sent:	Thursday, November 13, 2014 4:25 PM
To:	Larry Thompson; John Wooster; daniel_welsh@fws.gov; Alison Willy; Anna Ewing (Anna.ewing@wildlife.ca.gov); Hoobler, Sean@Wildlife (Sean.Hoobler@wildlife.ca.gov); Parker Thaler; Traci Van Thull; blancapaloma@msn.com
Cc:	Curt Aikens; Geoff Rabone (grabone@ycwa.com); Ward, David M (hydro); Pitts, Sheila
Subject:	Yuba Project: Draft Streambed Monitoring Below Englebright Dam Plan for Your Review - Written Comments due by COB 12/15/14
Attachments:	Sediment Monitoring Below Englebright Plan - JML111314.doc; Attachment B Files.zip

In a letter dated October 8, 2014, FERC directed YCWA to develop two plans to minimize the potential for adverse effects to the fishery in the Yuba River downstream of the USACE's Englebright Dam due to operations YCWA's Narrows 2 Powerhouse, Narrows 2 Partial Bypass (Partial Bypass) and Narrows 2 Full Bypass (Full Bypass) due to stranding, and to file the plans with FERC by January 6, 2015 for approval. FERC directed that YCWA develop the plans in consultation with the resource agencies and applicable stakeholders.

Attached for your review is a draft of the *Streambed Monitoring Below Englebright Dam Plan*, the first of the two plans.

We would appreciate any written comments you may have on the attached plan by close of business on MONDAY, DECEMBER 15, 2014.

If we have any questions or need clarifications regarding your written comments, we will contact you. We will revise the plan based on written comments and file it with FERC by January 6, 2015. If we do not adopt a written proposed change to the plan, we will include in the final plan that we file with FERC the reason we did not adopt the proposed change.

Within the 30-day review period, we would be pleased to discuss the plan with you if you would like to do so, but written comments would still be due by December 15, 2014.

The second of the two plans is the *Narrows 2 Facilities Prioritized Operations and Monitoring Plan*. We plan to e-mail a draft of that plan to you within a week for your 30-day review.

If you have any questions regarding the attached plan or would like to schedule a time to discuss the plan, please contact Jim Lynch.

Curt Aikens
General Manager
Yuba County Water Agency
Direct: 530-741-5015
Main: 530-741-5000

This email was sent to the above agencies and applicable stakeholders on behalf of the above party by:

James Lynch
Senior Vice President, Hydropower Services

HDR
2379 Gateway Oaks Drive, Suite 200
Sacramento, CA 95833
D 916.679.8740 **M** 916.802.6247
James.Lynch@hdrinc.com

hdrinc.com/follow-us

Mr. Curt Aikens
General Manager
Yuba County Water Agency
1220 F Street
Marysville, CA 95901

Dear Mr. Aikens,

DRAFT STREAMBED MONITORING BELOW ENGLEBRIGHT DAM PLAN (PLAN) COMMENTS ON THE YUBA RIVER DEVELOPMENT PROJECT, FEDERAL ENERGY REGULATORY COMMISSION (FERC) PROJECT NO. 2246; YUBA, SIERRA, AND NEVADA COUNTIES.

In a letter dated October 8, 2014, FERC's Chief of Aquatic Resource Branch of the Division of Hydropower Administration and Compliance directed Yuba County Water Agency (YCWA) to develop two plans to minimize the potential for adverse effects to the fishery in the Yuba River downstream of Englebright Dam due to operations of YCWA's Narrows 2 facility. FERC further directed YCWA develop these plans in consultation with resource agencies. YCWA has developed the *Draft Streambed Monitoring Below Englebright Dam Plan*, and the *Draft Narrows 2 Facilities Prioritized Operations and Monitoring Plan*. YCWA has given resource agencies 30 days to comment on each plan.

On November 13, 2014, YCWA submitted the *Draft Streambed Monitoring Below Englebright Dam Plan* to resource agencies requesting written comments by December 15, 2014. The *Narrows 2 Facilities Prioritized Operations and Monitoring Plan* was submitted to resource agencies on November 22, 2014. Below are State Water Board staff's comments are on the *Draft Streambed Monitoring Below Englebright Dam Plan* (Plan):

1. Page 1-7 describes the purpose of the Plan as, "to reduce the potential for adverse effects to the fishery in the Yuba River downstream of Englebright Dam due to fish stranding related to operations of the Narrows 2 Facilities."

   Please explain what operations at Narrows 2 facility have the potential to create a situation in which fish stranding can occur. Also, please include a summary of the past stranding incidents.

2. Figure 2.3-1 illustrates YCWA's classification of sedimentary zones in the Yuba River below Englebright Dam. The dark brown color in Figure 2.3-1's key is described as "Angular Rock from Englebright Dam Abutments and Construction." State Water Board staff suggests YCWA categorize the rock for the material it is composed of and not provide an opinion as to its source.

3. Page 3-2, Figures 3.1-1 and 3.1-2, please include the cubic feet per second (cfs) flow as recorded at Smartsville.

4. Page 4-1, Section 4.1.1 *Reformation of Existing Isolation Pool* describes that once the isolation pool is removed, YCWA will photo document the final configuration of the gravel at several different locations. YCWA then plans to retake the photos at the same locations during each annual outage of Narrows 2 Facility to determine changes in the gravel configuration adjacent to the facility. State Water Board staff suggests YCWA also document the cfs flow as recorded at Smartsville, and how much flow from each facility is being released.

If you have any questions regarding this letter, please contact Parker Thaler, Project Manager, at 916-341-5321, or by email at parker.thaler@waterboards.ca.gov. Written correspondence should be addressed as follows:

State Water Resources Control Board
Division of Water Rights
Water Quality Certification Program
Attn: Parker Thaler
P.O. Box 2000
Sacramento, CA 95812-2000

Sincerely,

Parker Thaler
Environmental Scientist
Water Quality Certification Program

(cc located on next page)

cc:

Ms. Anna Ewing, FERC Program Coordinator
California Department of Fish and Wildlife
North Central Region
1701 Nimbus Road
Rancho Cordova, CA 95670

Ms. Alison Willy
U.S. Fish and Wildlife Service
2800 Cottage Way, Rm.W-2605
Sacramento, CA 95825

Steve Edmondson, FERC Branch Supervisor
National Marine Fisheries Service, West Coast Region
California Central Valley Office
650 Capitol Mall, Suite 5-100
Sacramento, CA 95814-4706

Mr. Adam Laputz
Supervising Water Resource Control Engineer
Central Valley Regional Water Quality Control Board
11020 Sun Center D, Suite 200
Rancho Cordova, Ca 95670

Streambed Monitoring Below Englebright Dam Plan

Attachment B

15-Minute Hydrology for Narrows 2 Powerhouse, Full Bypass, Partial Bypass Narrows 1 Powerhouse, Englebright Dam Spills and Smartsville Gage from WYs 2007 through 2014

Yuba River Development Project

FERC Project No. 2246

December 2014

ATTACHMENT B

15-Minute Hydrology for Narrows 2 Powerhouse, Full Bypass, Partial Bypass Narrows 1 Powerhouse, Englebright Dam Spills and Smartsville Gage from WYs 2007 through 2014 on Digital Versatile Disc

Due to format of the material in this Attachment B to YCWA's final Streambed Monitoring Below Englebright Dam Plan, YCWA cannot e-file this material with FERC. Instead, YCWA is filing with FERC the material on Compact Disc (CD). Copies of the material on CD may be obtained upon request by contacting Jim Lynch, relicensing consultant to YCWA via telephone at (916) 679-8740 or via email at James.Lynch@hdrinc.com.

The following material is included on this CD as one zip file:

- Historical Hydrology Below Englebright, WYs 2007 through 2014 (.dss file-format, approximately 2 MB)
- Historical Smartsville Monthly Exceedances (MS Excel .xlsb file, approximately 3 MB)
- Historical WY Data (MS Excel .xlsb file, approximately 1 MB)