SECTION 2.0

PROPOSED ACTION AND ALTERNATIVES

This section describes the existing Project (i.e., No-Action Alternative) and YCWA's proposed changes to the existing Project (i.e., YCWA' proposed Project). Section 2.1 describes the No-Action Alternative, the baseline from which to compare all action alternatives. Section 2.2 describes YCWA's proposed Project. Section 2.3 describes any other action alternatives proposed at this time. Section 2.4 describes alternatives considered but not analyzed in detail in this document.

2.1 No Action Alternative

Under the No-Action Alternative, the Project would continue to operate into the future as it has historically operated (i.e., for the past 5 years), and no new environmental PM&E measures would be implemented. Provided below is a description of: 1) existing Project facilities (Section 2.1.1); 2) existing Project Boundary (Section 2.1.2); 3) Project safety (Section 2.1.3); 4) current Project operations (Section 2.1.4); and 5) conditions in the existing FERC license and other agreements and contracts that affect existing Project operations (Section 2.1.5).

2.1.1 Existing Project Facilities

The existing Project includes three developments – New Colgate, New Bullards Bar Minimum Flow and Narrows 2 - each of which is described below. Existing Project facilities are shown in Figure 1.1-2 in Section 1.1 of this Exhibit E.

The existing Project can store approximately 966,770 acre-feet (ac-ft) of water (gross storage), and has generated an average of about 1,278,585 MWh/yr of power annually from 2008 through 2012 (Table D5.2-1). The existing Project's total installed capacity is 361,900 kilowatts (kW) and the dependable capacity is 248,080 kW (Tables D5.2-7 and D5.2-2, respectively.) Table 2.1-1 and Table 2.1-2 summarize key information for Project powerhouses and reservoirs, respectively.

Table 2.1-1. Key information regarding Yuba River Development Project powerhouses.

Powerhouse	Unit	Turbine Type	Rated Head (ft)	Rated Hydraulic Capacity (cfs)		Generation Capacity (kW)		Average Annual Energy (MWh/yr)[3]
				Minimum	Maximum	Nameplate Rating[1]	Dependable[2]	
New Colgate	1	Pelton	1,306	0	1,715	157,500	231,497	1,233,701
New Colgate	2	Pelton	1,306	0	1,715	157,500		
New Bullards Bar Minimum Flow	1	Pelton	561	0	5	150	57	952
Narrows 2	1	Francis	236	600	3,400	46,750	0	172,780
Total	**4**	--	--	--	--	**361,900**	**231,554**	**1,407,433**

[1] From Table 5.2-5 in Exhibit D.
[2] From Table 5.2-7 in Exhibit D (i.e., modeled dependable capacity from water year (WY) 1970 through WY 2010).
[3] From Table 5.2-2 in Exhibit D (i.e., modeled average annual generation from WY 2070 through WY 2010).

Table 2.1-2. Key information regarding Yuba River Development Project reservoirs and impoundments.

Project Reservoir	NMWSE[1] (ft)	Gross Storage[2] (ac-ft)	Usable Storage[2] (ac-ft)	Surface Area[2] (ac)	Maximum Depth[2] (ft)	Shoreline Length[2] (mi)	Drainage Area[3] (sq mi)
Our House Diversion Dam Impoundment	2,030	280	None	14	65	0.7	144.8
Log Cabin Diversion Dam Impoundment	1,970	90	None	5	40	0.4	29.1
New Bullards Bar Reservoir	1,956	966,400	966,103	4,790	636	71.9	466.6
Total	--	**966,770**	**966,103**	**4,809**	--	--	--

[1] NMWSE = Normal Maximum Water Surface Elevation
[2] At NMWSE
[3] At the dam, and drainage areas are not additive.

2.1.1.1 New Colgate Development

The New Colgate Development consists of the following features:

1. Our House Diversion Dam is a 130-foot (ft) radius, double curvature, concrete arch dam located in Sierra County on the Middle Yuba River 12.6 mi upstream of its confluence with the North Yuba River. The dam is 70 ft high with a crest length of 368 ft and a crest elevation of 2,030 ft, and has a drainage area of 144.8 square miles (sq mi). The dam has a spillway, a fish release outlet valve used for releasing minimum flow requirements in the existing FERC license, and a low level (5-foot diameter) outlet valve.[1] The spillway, with an invert elevation of 2,030 ft is ungated and has a maximum capacity of 60,000 cubic feet per second (cfs). The fish release outlet valve has an invert elevation of 1,990 ft, and an engineer's estimated maximum capacity of 59 cfs[2] when the pool is at the invert (2,015 ft) of the Lohman Ridge Diversion Tunnel. The fish release outlet is controlled by a hand-operated 24-inch (in) valve on the downstream end of the outlet. The low level outlet has an invert elevation of 1,987 ft, and an engineer's estimated maximum capacity of 463 cfs[3] when the pool is at the invert of the Lohman Ridge Diversion Tunnel.

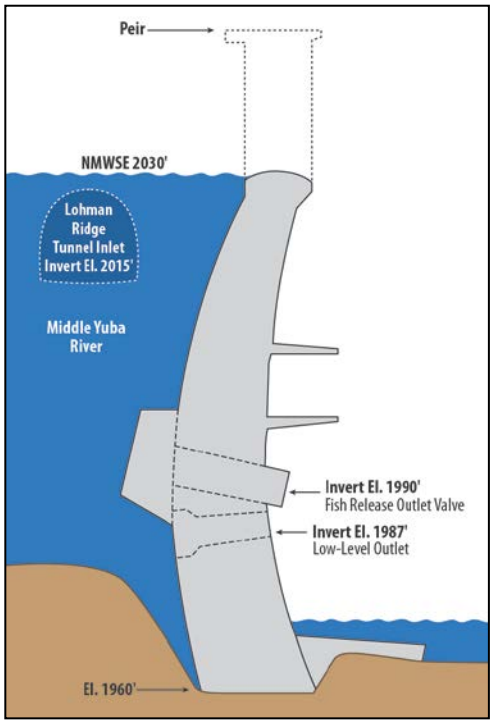

Figure 2.1-1. Our House Diversion Dam features.

[1] For the purpose of the application, the slide gate that controls the Our House Diversion Dam low level outlet is referred to as a "valve."
[2] YCWA plans to rate the Our House Diversion Dam fish release valve in spring 2015.
[3] YCWA plans to rate the Our House Diversion Dam low level outlet valve in spring 2015.

The low level outlet is controlled by a slide gate, which is is operated by a two-person mobile gasoline powered engine, on the upstream face of the dam.

2. Our House Diversion Dam Impoundment, a 280 ac-ft impoundment formed by Our House Diversion Dam.

3. Lohman Ridge Diversion Tunnel, a 12.5-ft high by 12.5-ft wide tunnel that conveys a maximum flow of 860 cfs through its 19,410 ft (90% unlined and 10% lined) length from the Middle Yuba River to Oregon Creek. The invert of the tunnel intake is at elevation 2,015, ft, which is 15 ft below the normal maximum water surface elevation (NMWSE) for Our House Dam (i.e., water can only be diverted through the tunnel when the impoundment's WSE is 2,015 or greater).

4. Log Cabin Diversion Dam, is a 105-ft radius, concrete arch dam located in Yuba County on Oregon Creek 4.3 mi upstream of the confluence with the Middle Yuba River. The dam is 42.5 ft high with a crest length of 300 ft, a crest elevation of 1,970 ft, and a drainage area of 29.1 sq mi. The dam has a spillway, a fish release outlet valve used for releasing minimum flow requirements in the existing FERC license, and a low level (5-ft diameter) outlet valve.[4] The spillway, with an invert elevation of 1,970 ft is ungated and has a maximum capacity of 12,000 cfs. The fish release outlet valve has an invert elevation of 1,947 ft and an engineer's estimated maximum capacity of 18 cfs[5] when the pool is at the invert (1,952 ft) of the Camptonville Diversion Tunnel. The outlet is controlled by a hand-operated valve on the downstream end of the outlet. The low level outlet has an invert elevation of 1,935 ft, and an engineer's estimated maximum capacity of 348 cfs[6] when the pool is at the invert of the Camptonville Diversion Tunnel. The low level outlet is controlled by a slide gate, which is operated by a two-person mobile gasoline powered engine, on the upstream face of the dam.

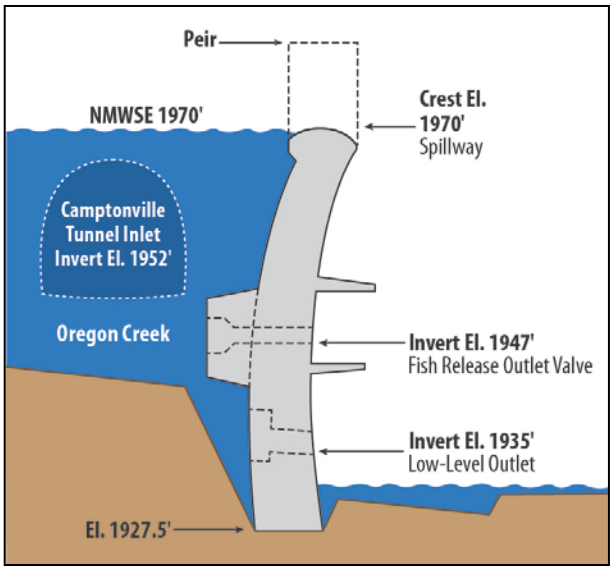

Figure 2.1-2. Log Cabin Diversion Dam features.

5. Log Cabin Diversion Dam Impoundment, a 90 ac-ft impoundment formed by Log Cabin Diversion Dam.

[4] For the purpose of the application, the slide gate that controls the Log Cabin Diversion Dam low level (5-foot diameter) outlet is referred to as a "valve."
[5] YCWA plans to rate the Log Cabin Diversion Dam fish release valve in spring 2015.
[6] YCWA plans to rate the Log Cabin Diversion Dam low level outlet valve in spring 2015.

6. Camptonville Diversion Tunnel, a 6,107-ft long tunnel that has the capacity to convey 1,100 cfs of water from Oregon Creek to New Bullards Bar Reservoir on the North Yuba River. The first 4,275 ft of the conduit is an unlined, horseshoe-shaped tunnel 14.5 ft wide by 14.5 ft high, which (for the last 1,832 ft) becomes a lined, horseshoe-shaped tunnel 11.7 ft wide by 13 ft high. The tunnel invert elevation is 1,952 ft, which is 18 ft below the NMWSE for Log Cabin Diversion Dam (i.e., water can only be diverted through the tunnel when the impoundment's WSE is greater than 1,952 ft).

7. New Bullards Bar Dam, a 1,110-ft radius, double curvature, concrete arch dam located on the North Yuba River about 2.4 mi upstream of its confluence with the Middle Yuba River. The dam is 645 ft high with a maximum elevation of 1,965 ft. The dam includes one low-level outlet – a 72-in Hollow Jet Valve (invert elevation 1,444.5 ft) with a maximum design capacity of about 3,500 cfs at full reservoir pool, and an actual capacity of 1,250 cfs (i.e., actual release capacity is limited to 1,250 cfs because of valve vibrations at higher release rates). The dam includes an overflow-type spillway with a width of 106 ft and a crest elevation of 1,902 ft. Control gates on the spillway consist of three Tainter Gates measuring 30 ft wide and 54 ft tall, and hoisted by 10 horsepower drum hoists. The maximum design capacity of the spillway is 160,000 cfs. Figure 2.1-3 provides a longitudinal schematic of New Bullards Bar Dam.

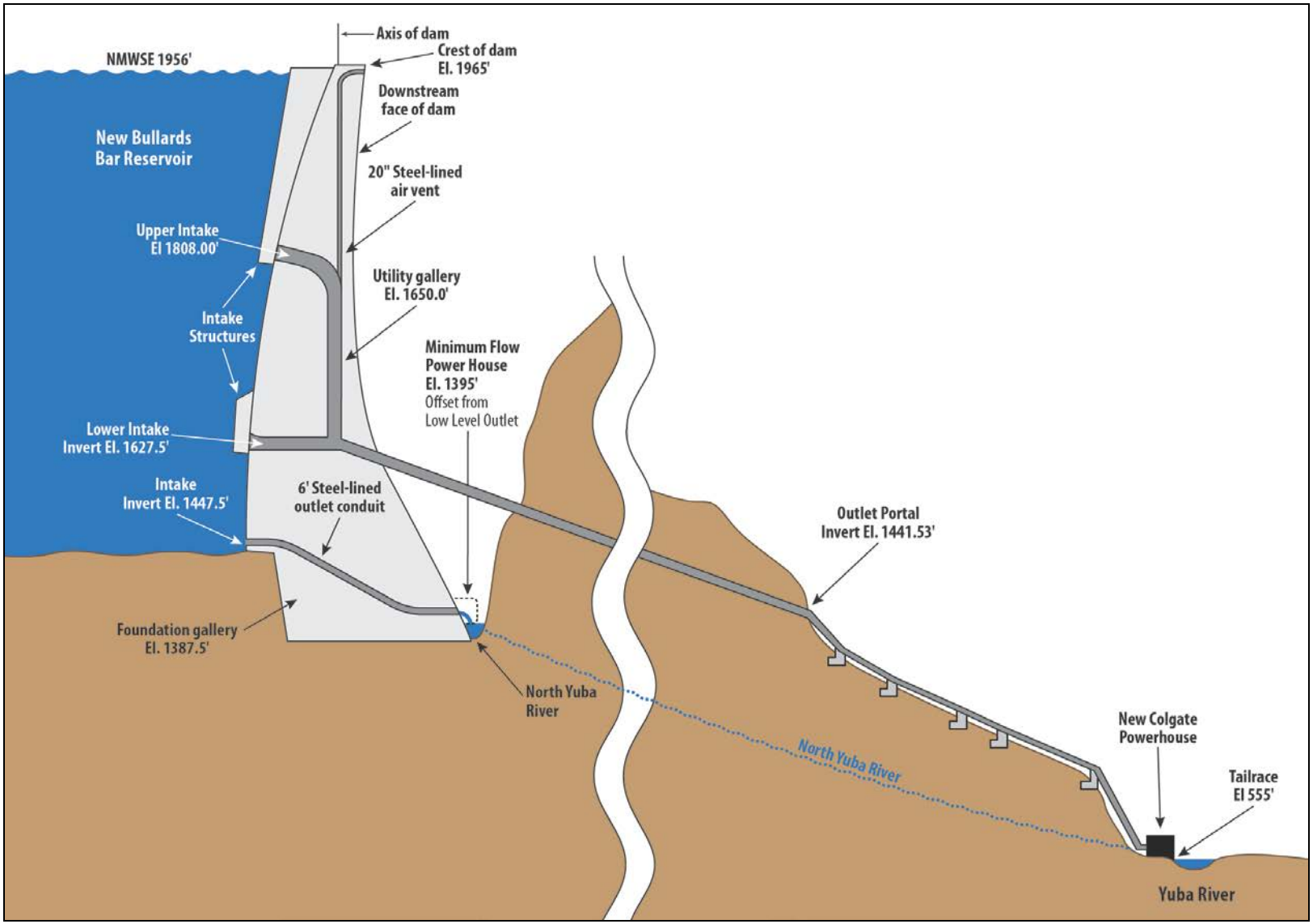

Figure 2.1-3. Longitudinal schematic of New Bullards Bar Dam on the North Yuba River and New Colgate Power Tunnel and Powerhouse on the Yuba River.

8. New Bullards Bar Reservoir, a storage reservoir on the North Yuba River formed by New Bullards Bar Dam. At NMWSE (1,956 ft), New Bullards Bar Reservoir extends about 15.3 river miles upstream on the North Yuba River, has an estimated storage capacity of 966,103 ac-ft, a surface area of 4,790 ac, a shoreline of about 71.9 mi, and a drainage area of 488.6 sq mi.

9. New Colgate Power Tunnel Intake, a structure on the upstream face of New Bullards Bar Dam composed of a curtain wall, trashrack and two intakes, one with an invert elevation of 1,808 ft and the other with an invert elevation of 1,627.5 ft. The upper intake is not used per the direction of Cal Fish and Wildlife. (Figure 2.1-3).

10. New Colgate Power Tunnel and Penstock, a 5.2 mi long conveyance facility composed of four different types of conveyance structures: an unlined horseshoe-shaped tunnel 26 ft square; a lined horseshoe-shaped tunnel 20 ft wide and 14.5 ft high; a lined circular tunnel 14 ft in diameter; and 2,809 ft of steel penstock with a diameter ranging from 9 ft to 14.5 ft. The tunnel and penstock have a maximum flow capacity of 3,500 cfs (Figure 2.1-3).

11. New Colgate Powerhouse and Switchyard, an aboveground, steel reinforced, concrete powerhouse located adjacent to the Yuba River. The powerhouse contains two Voith Siemens Pelton type turbines with a total actual measured capacity of 340 MW under a design head of 1,306 ft and a measured flow of 3,430 cfs. The New Colgate Switchyard is located adjacent to New Colgate Powerhouse. (Figure 2.1-3)

12. New Bullards Bar Reservoir Recreation Facilities, 16 recreation facilities, which include: 1) Hornswoggle Group Campground; 2) Schoolhouse Campground; 3) Dark Day Campground; 4) Cottage Creek Campground;[7] 5) Garden Point Boat-in Campground; 6) Madrone Cove Boat-in Campground; 7) Frenchy Point Boat-in Campground; 8) Dark Day Picnic Area; 9) Sunset Vista Point; 10) Dam Overlook; 11) Moran Road Day Use Area; 12) Cottage Creek Boat Launch;[8] 13) Dark Day Boat Launch, including the Overflow Parking Area; 14) Schoolhouse Trail; 15) Bullards Bar Trail;[9] and 16) floating comfort stations. All of the recreation facilities are located on NFS land, with the exception of the Dam Overlook, Cottage Creek Boat Launch and small portions of the Bullards Bar Trail, which are located on land owned by YCWA. All of the developed recreation facilities are located within the existing FERC Project Boundary, except for a few short segments of the Bullards Bar Trail to the east of the Dark Day Boat Launch.

[7] Cottage Creek Campground was burned in 2011 and has not been rebuilt. YCWA is in discussions with the Forest Service regarding rebuilding the burned campground.

[8] Emerald Cove Marina provides visitor services at Cottage Creek Boat Launch, including houseboat and boat rentals, boat slips and moorings, fuel and a general store. The marina is operated under a lease from YCWA by a private company.

[9] The Project recreation facilities included one campground that is no longer part of the Project. Burnt Bridge Campground was closed initially by the Forest Service in 1979 due to low use levels. FERC, in an August 19, 1993 Order, which approved YCWA's Revised Recreation Plan, directed YCWA to remove all improvements and restore the Burnt Bridge Campground to the condition it was in prior to development of the facility. YCWA consulted with the Forest Service and all that remains of Burnt Bridge Campground today is the circulation road and vehicle spurs; all other facilities were removed.

13. Streamflow Gages, three streamflow gages, one each located downstream of Our House Diversion Dam (United States Geological Survey [USGS] Gage 11408880), downstream of Log Cabin Diversion Dam (USGS Gage 11409400), and downstream of New Bullards Bar Dam (USGS Gage 11413517).

14. Roads, 24 Primary Project Road segments for a total length of 7.22 mi, and 9 recreation-related road segments for a total length of 2.78 mi (Exhibit A).

2.1.1.2 New Bullards Bar Minimum Flow Development

The New Bullards Bar Minimum Flow Development consists of the following facilities and features:

1. New Bullards Minimum Flow Powerhouse Penstock, a 70-ft long, 12-in diameter steel penstock with a maximum flow capacity of 6 cfs (Figure 2.1-3). The penstock bifricates off the New Bullards Bar Dam low level out upstream of the 72-in Hollow Jet Valve.

2. New Bullards Minimum Flow Powerhouse, a single Pelton turbine with a capacity of 150 kW at a flow of 5 cfs (Figure 2.1-3).

3. New Bullards Minimum Flow Transformer, a transformer located adjacent to the New Bullards Minimum Flow Powerhouse.

The New Bullards Bar Minimum Flow Development does not include any recreation facilities, streamflow gages,[10] Primary Project Roads or recreation roads.

2.1.1.3 Narrows 2 Development

The Narrows 2 Development consists of the following features:

1. Narrows 2 Powerhouse Penstock, 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. The penstock has a maximum flow capacity of 3,400 cfs. Figure 2.1-4 provides a longitudinal schematic of the Narrows 2 Powerhouse Penstock and Powerhouse.

2. Narrows 2 Full Bypass, a valve and penstock branch off the Narrows 2 Penstock, which can discharge up to 3,000 cfs of water at full head into the Yuba River immediately upstream of the Narrows 2 Powerhouse through a 72-in diameter fixed-cone valve. The full bypass was installed in 2008 to maintain minimum flows during times of full shutdown of the Narrows 2 Powerhouse (Figure 2.1-4).

[10] The New Bullards Bar Minimum Flow Development does not include any streamflow or reservoir gages. However, YCWA uses USGS Gage 11413517, North Yuba River Downstream from New Bullards Bar Dam, listed under the New Colgate Development, to measure releases from the New Bullards Bar Minimum Flow Powerhouse.

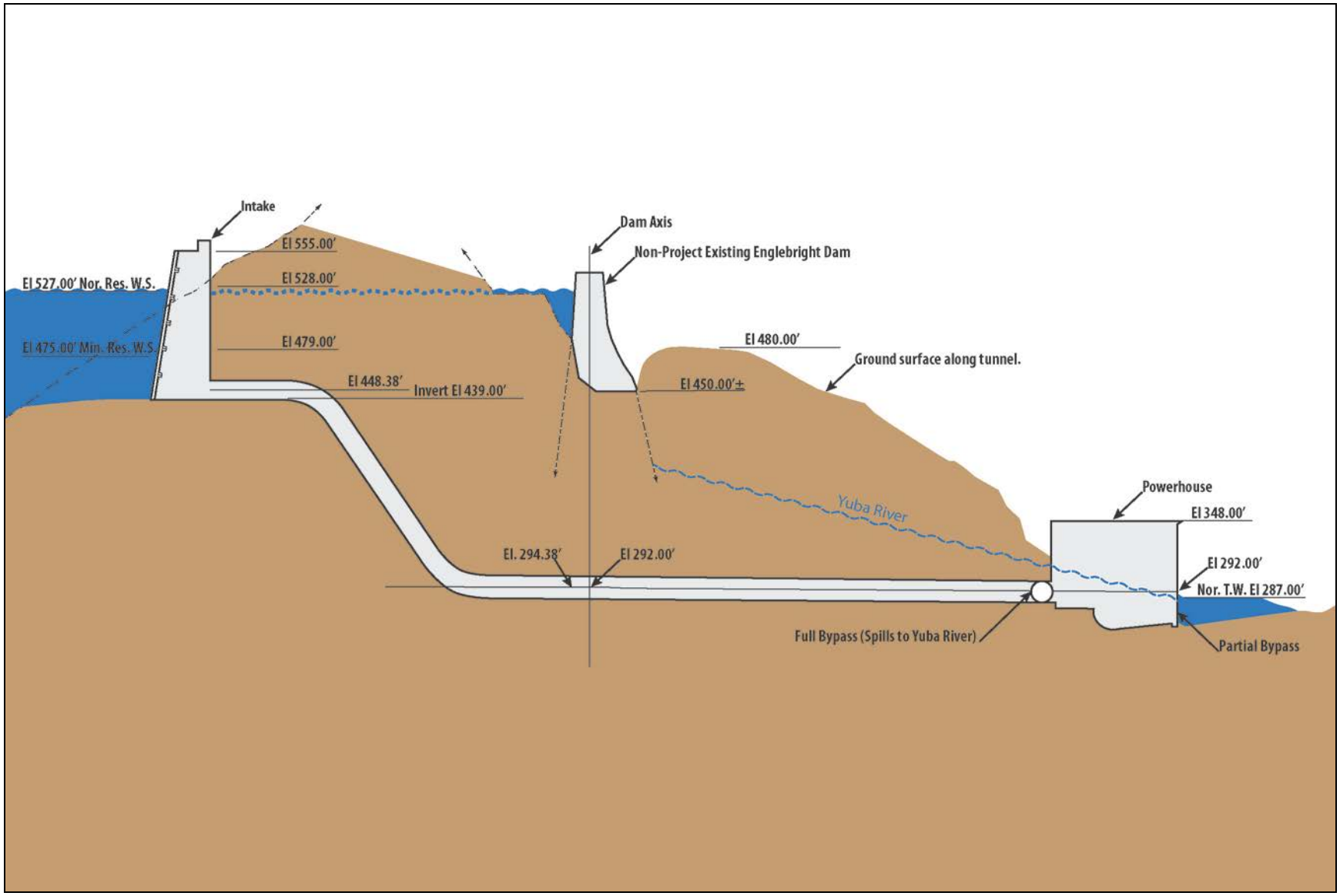

Figure 2.1-4. Longitudinal schematic of Narrows 2 Powerhouse Penstock and Powerhouse.

3. Narrows 2 Powerhouse and Switchyard, an indoor powerhouse located about 200 ft downstream of Englebright Dam. The powerhouse consists of one vertical axis Francis turbine with a capacity of 55 MW at a head of 236 ft and flow of 3,400 cfs. The powerhouse includes a pipe off the Narrows 2 Powerhouse turbine scroll case, which can discharge up to 650 cfs of water at full head into the Yuba River through a 36-in valve located on the downstream face of the powerhouse above the draft tube outlet. This Partial Bypass was built as part of the original design when the Narrows 2 Powerhouse was constructed, and normally releases no more than about 300 cfs (i.e., the Full Bypass is used for higher flow releases). The Narrows 2 Powerhouse Switchyard is located adjacent to the powerhouse.

4. Roads, 6 Primary Project Road segments for a total length of 2.48 mi (Exhibit A).

The Narrows 2 Development does not include any streamflow gages,[11] recreation facilities or recreation roads.

2.1.2 Existing Project Boundary

The FERC Project Boundary is intended to consist of all lands necessary for the safe operations and maintenance of the Project and other purposes, such as recreation, shoreline control, and protection of environmental resources. For the Yuba River Development Project, the existing boundary encompasses 7,815.3 ac of land in Yuba, Nevada and Sierra counties, California. The existing FERC Project Boundary includes a zone of area that encloses all Project facilities and features. The width of the zone around a facility or feature varies depending on the type of Project facility or feature and the activities associated with it.

A total of 55.1 percent of the land (4,306.3 ac) within the FERC Project Boundary is NFS land, and 0.2 percent (16.1 ac) is USACE land. Three-tenths percent of the land (20.1 ac) is State of California-owned land. YCWA owns 41.7 percent of the land (3,258.6 ac) within the existing boundary. The remaining 2.7 percent of the land (214.3 ac) within the existing FERC Project Boundary is in private ownership.

2.1.3 Existing Project Safety

The Project has been operating for more than 45 years under the existing license and during this time FERC staff has conducted operational inspections focusing on the continued safety of the structure, identification of unauthorized modifications, efficiency and safety of operations, compliance with the terms of the license, and proper maintenance. In addition, the Project has been inspected and evaluated every 5 years by an independent consultant and a consultant's safety report has been submitted for FERC's review. YCWA has a strong commitment to

[11] The Narrows 2 Development does not include any streamflow gages. However, YCWA uses data from two USGS existing streamflow gages on the Yuba River to document compliance with existing minimum streamflow requirements. These gages are Gage 11418000 (at Smartsville) and Gage 11421000 (at Marysville).

employee and public safety, which is reflected in its written safety procedures and training program, and its safety record.

2.1.4 Existing Project Operations

One of YCWA's major considerations each year is anticipated water availability. YCWA begins estimating water availability each year in January and continually updates the estimate throughout the spring runoff period. When estimating available water supply, YCWA considers current reservoir storage and California Department of Water Resources (CDWR) Bulletin 120 forecasts of unimpaired flow at the Smartsville gage on the lower Yuba River and the Goodyears Bar gage on the North Yuba River. Estimates of available water supply and other water needs are compared to estimates of required releases, consumptive demands within YCWA, and target levels for fall carryover storage in New Bullards Bar Reservoir.

Typically, YCWA operates New Bullards Bar Reservoir by capturing winter and spring runoff from rain and snowmelt. The North Yuba River inflow to New Bullards Bar Reservoir is augmented by diversions from the Middle Yuba River to Oregon Creek through the Lohman Ridge Tunnel, and by diversions from the Lohman Ridge Tunnel and Oregon Creek into the reservoir through the Camptonville Tunnel.[12] Consequently, New Bullards Bar Reservoir normally reaches its peak storage at the end of the spring runoff season, and then is gradually drawn down until its lowest elevation in early to mid-winter. The reservoir does not undergo significant daily changes in elevation.

New Bullards Bar Reservoir has mandatory reserved flood storage space criteria from mid-September through the end of May that limit maximum authorized storage (See Section 2.1.5.1). The Our House and Log Cabin diversion dam impoundments have no appreciable storage, and YCWA operates them exclusively to divert water to New Bullards Bar Reservoir in the winter and spring during high flow periods.

In the spring of each year, YCWA makes a determination of anticipated runoff into New Bullards Bar Reservoir relying upon snow course measurements and forecasts of runoff provided by CDWR. YCWA also makes estimates of water needs for local water deliveries and for releases to meet required instream flows for the current water year (WY). Based on these forecasts, an end-of-September storage is estimated. If the forecasted end-of-September storage is higher than a pre-determined target (650,000 ac-ft),[13] releases are increased above the required flows to draw reservoir storage down to the target level. The target storage is an operational measure used to drive releases in relatively wet years.[14]

[12] The average total inflows to New Bullards Bar Reservoir from the North Yuba River and diversions from the Middle Yuba River and Oregon Creek are about 1,200,000 ac-ft per year, and annual inflow has ranged from a low of 163,000 ac-ft in 1977 to a high of 2,800,000 ac-ft in 1982.

[13] An end-of-September storage of 650,000 ac-ft would ensure adequate storage to meet full irrigation demands and dry-year flow requirements for a 99 percent exceedance drought in the following year.

[14] The end-of-September target storage drives New Bullards Bar Reservoir operations in 56 percent of years under the Base Case scenario.

In addition to the target storage, there is a carryover storage requirement for drought protection purposes. If forecasted end-of-September storage falls below an end-of-September carryover storage requirement, agricultural deliveries may be reduced to ensure adequate water supply for the following year. Reservoir carryover storage is used to make up the difference between the available surface water supply and system demands (e.g., diversion demands, instream flow requirements, and system operational losses) under drought conditions.

In wetter years YCWA operates New Bullards Bar Reservoir to an end-of-September target storage level for the Lower Yuba River Accord of 650,000 ac-ft, as well as other target storage levels for various times in mid-winter that are parts of power generation operations and flood control operations.

The New Bullards Bar Minimum Flow Powerhouse is operated as a "base load" facility where flows are set at a constant rate to provide the required instream flows downstream of New Bullards Bar Dam.

The New Colgate Powerhouse is a highly versatile facility, and is used for a combination of peaking and base generation. Depending upon energy demand, the New Colgate Powerhouse generation can be fluctuated in less than 10 minutes from a minimum of 1 MW with only one unit operating to maximum load of 340 MW with both units operating, if both units are ramped up at the same time. This ability to rapidly fluctuate generation, together with substantial storage available in New Bullards Bar Reservoir, makes the New Colgate Powerhouse important and unique to the Northern California power grid.

For most of the year, New Colgate Powerhouse is operated as a peaking facility, or to provide ancillary services such as spinning reserves or regulation. Under peaking operations, releases through the powerhouse are concentrated to hours of the day when power is most valuable or when power is needed most (such as weekdays from mid-morning through early evening, largely corresponding to warmer times of the day and/or peak workday and early evening hours). Under ancillary services operations, the generating station is ramped upwards or downwards quickly, to respond to power system load changes on a near-real-time basis, and generating station output and flows may vary substantially minute-to-minute. The New Colgate Powerhouse also often operates under a combined peaking/ancillary service protocol, with one unit operating in peaking mode and the other unit responding to ancillary service requirements. During some of the late 1990s and early 2000s, New Colgate Powerhouse operations were focused on weekday peak generation. More recently, power generation has shifted to a schedule driven by a balance of peak period generation and providing ancillary services to the region.

At many times, New Colgate Powerhouse provides a significant percentage of the required ancillary service for grid regulation of the region, as dispatched by the California Independent System Operator (ISO), the entity responsible for maintaining grid reliability in California. Peaking operations dominate power generation operations at New Colgate Powerhouse. However, under high flow conditions, some or all of the available capacity is used for base load generation, generating inexpensive power while excess water must be moved through the system anyway.

Table 2.1-3 provides a summary of the typical historical flow range of operations through the Narrows 1 Powerhouse, Narrows 2 Powerhouse, the Narrows 2 partial bypass and the Narrows 2 full bypass. Because of the higher efficiency of the Narrows 1 Powerhouse at lower flows and the fact that releases through the Narrows 1 Powerhouse result in energy generation that qualifies for California Renewable Portfolio Standard (RPS) credit and revenue and PG&E is required to meet a certain percentage of its total generation through RPS, PG&E prefers at certain times and under certain energy market conditions to run Narrows 1 Powerhouse and to bypass flows at the Narrows 2 Powerhouse. Because PG&E receives all power generated by both powerhouses, and because PG&E's payments to YCWA under the existing power purchase contract are not affected by the relative amounts of power generated by the two powerhouses, YCWA has agreed with PG&E's decisions regarding the coordinated operation of the two powerhouses. These coordinated operations may change after April 30, 2016, when the term of the existing power purchase contract with PG&E ends.

Table 2.1-3. Typical distribution of flow under normal operations (i.e., excluding brief change-over periods) among Narrows 1 Powerhouse, Narrows 2 Powerhouse, Narrows 2 Partial Bypass and Narrows 2 Full Bypass. Normally, for Narrows 2 Powerhouse, Partial Bypass and Full Bypass, only one operates at a time, excluding brief change-over periods.

Range of Flow Releases to Yuba River (cfs)	Narrows 1 Powerhouse Release (cfs)	Narrows 2 Powerhouse Release[2] (cfs)	Narrows 2 Partial Bypass[2] (cfs)	Narrows 2 Full Bypass[2] (cfs)	Englebright Dam Spill (cfs)
Up to 730	150 - 730	0	Up to 100 cfs	>100 cfs Used to Supplement Narrows 1 Powerhouse Flow to Meet Minimum Flows	0
730 - 900	730	0	Up to 100 cfs	>100 cfs Used to Supplement Narrows 1 Powerhouse Flow to Meet Minimum Flows	0
900 - 1,630[1]	Up to 730	700 – 1,630	Typically not used	Used When Narrows 2 Powerhouse not available	0
1,630 - 3,400[1]	Up to 730	700 - 3,400	Typically not used	Used When Narrows 2 Powerhouse not available	0
3,400 - 4,130	Up to 730	2,670 – 3,400	Typically not used	0	0
> 4,130	Up to 730	3,400	Typically not used	0	All remaining flow

[1] The use of the Narrows 1 Powerhouse in this range is dependent on a number of economic factors and can vary from no flow to the maximum Narrows 1 Powerhouse capacity. In this range Narrows 2 alone or Narrows 1 with Narrows 2 may operate.

[2] The typical operating flow ranges of Narrows 2 facilities are limited by long-term reliability considerations, such as vibration and cavitation of runners; and are as follows: the Narrows 2 Powerhouse between 700 and 3,400 cfs (although occasionally as low as 600 cfs); the Partial Bypass between 0 and 100 cfs (although occasionally as high as 400 cfs); and the Full Bypass between 100 and 3,000 cfs.

Figure 2.1-5 shows mean daily flow through Narrows 1 and 2 Powerhouses and Narrows 2 Full Bypass since 2008 when the bypass was put into operation.[15]

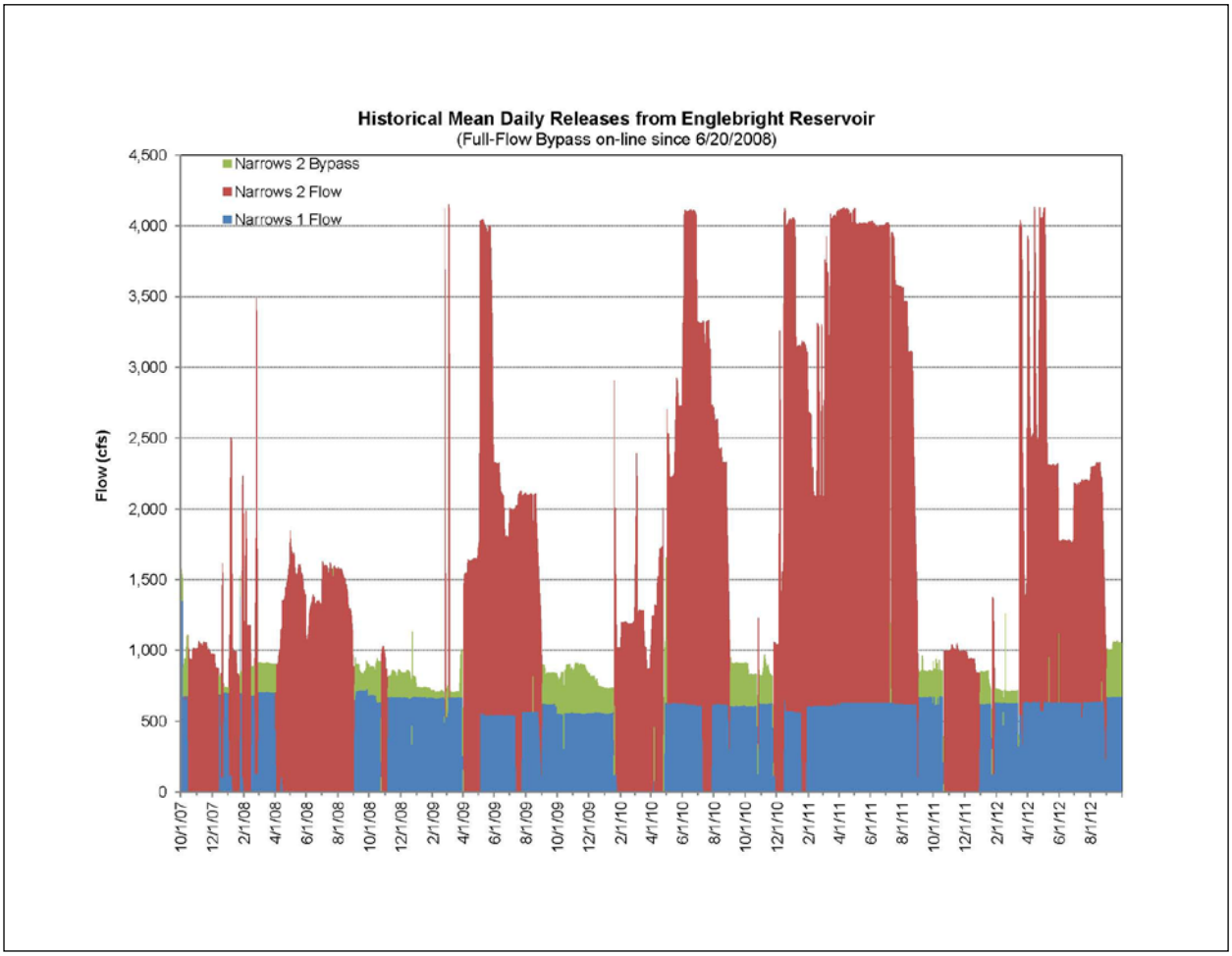

Figure 2.1-5. Flows through Narrows 1 Powerhouse, Narrows 2 Powerhouse and Narrows 2 Powerhouse Full Bypass from WY 2008 through WY 2011.

Use of the Partial Bypass is infrequent. From December 22, 2009 through April 10, 2012, YCWA operated the partial bypass during five events: twice in 2010 and twice in 2012. The partial bypass was not used in 2011.[16] Since installation of the full bypass, the partial bypass is typically only used for a few specific reasons, which include: 1) maintenance on the full bypass when generation is not possible; 2) obtaining foot access above the full bypass when generation is not possible; and 3) supplemental flow releases generally less than 100 cfs. Low-flow release below 100 cfs is not a hard rule, but the full bypass is switched over to the partial bypass if

[15] Prior to construction of the Narrows 2 Powerhouse Full Bypass, YCWA had the ability to pass some water through the powerhouse when it was not operating.

[16] In addition, the partial bypass was opened on October 25, 2012 to accommodate a relicensing study. This is not listed as one of the events because it was related to relicensing, not normal Project operations.

vibrational noise begins to occur at lower flows through the full bypass, which generally occur when less than 100 cfs is released.

2.1.5 Existing Environmental Measures

2.1.5.1 Measures in Current FERC License

The existing FERC license includes 60 articles. Of these, Licensee considers 19 articles (articles 28, 29, 30, 35, 36, 41, 42, 43, 44, 48, 50, 51, 52, 58, 60, 62, 65, 66, and 67), "expired" or "out of date" because each pertains to a construction activity that has been completed, a filing related to a construction activity that has been completed, or another activity that has been completed. As a result, the existing license contains 41 "active" articles. Of these, Articles 33, 34, 40, and 46 are more germane to Project operations than the other 37 articles. Each of these is provided below as it appears in the existing FERC License.

> **Article 33.** The Licensee shall maintain the following minimum streamflow schedules for maintenance of fish life in the several streams listed:
>
> (a)
>
> | (a) Stream | Flow (cfs)[1] | |
> |---|---|---|
> | | April 15 to June 15 | June 16 to April 14 |
> | Middle Yuba (below Hour House Diversion) | 50 | 30 |
> | Oregon Creek (below Log Cabin Diversion) | 12 | 8 |
> | North Yuba (below New Colgate Diversion) | 5 | 5 |
>
> [1] Or natural flow, whichever is less. Maximum 24-hour fluctuations of plus or minus 10 percent are permitted for flows in Middle Yuba below Hour House Diversion and in Oregon Creek below Log Cabin Diversion.
>
> (b)
>
(b) Stream	Flow (cfs)[1]			Measurement Point
	Jan. 1 to Jun. 30	Jul. 1 to Sept. 30	Oct. 1 to Dec. 31	
Yuba River (below Daguerre Dam)	245	70	400	Over the crest of Daguerre Point Dam and through fishway
>
> [1] Provided that these flows shall be in addition to releases made to satisfy existing downstream water rights.
>
> (c)
>
> Water releases for fish life as specified in paragraphs (a) and (b) of this article shall be subject to the following reduction in any critical dry year, defined as a water year for which the April 1 forecast of the California Department of Water Resources predicts that streamflow in the Yuba River at Smartsville be 50 percent or less of normal:
>
Yuba River at Smartsville streamflow forecast percent of normal	Reduction in Water Releases for Fish Life, Percent
50	15
45	20
40 or less	30

However, in no event shall releases for fish life below Daguerre Point Dam be reduced to less than 70 cfs. The critical dry year provisions herein shall be effective from the time the aforesaid forecast is available until the April 1 forecast of the following year.

(d)
In addition to maintaining winter minimum water releases for fish life in Yuba River below Daguerre Point Dam, as specified in paragraphs (b) and (c) of this article, the Licensee shall maintain uniform and continuous releases from Englebright Dam within the limits of the following schedule:

Period	Releases (cfs)[1]	Measurement Point
Oct. 16 to 31	600-1,050	New gaging station to be built downstream from the two Narrows powerhouses.
November	600-700	
December	600-1,400	
Jan. 1 to 15	1,000-1,850	
Jan. 16 to Mar. 31	600	

Provided that:

A. Variations from this schedule are permissible during emergencies, uncontrollable flood flows, and critical dry year curtailments.

B. With the exception of emergencies, releases required by U.S. Army Corps of Engineers flood control criteria, releases required to maintain a flood control buffer or for other flood control purposes, bypasses of uncontrolled flows into Englebright Reservoir, uncontrolled spilling, or uncontrolled flows of tributary streams downstream of Englebright Dam, Licensee shall make reasonable efforts to operate New Bullards Bar Reservoir and Englebright Reservoir to avoid fluctuations in the flow of the lower Yuba River downstream of Englebright Dam, and daily changes in project operations affecting releases or bypasses of flow from Englebright Dam shall be continuously measured at the USGS gage at Smartsville, and shall be made in accordance with the following conditions:

i. Project releases or bypasses that increase streamflow downstream of Englebright Dam shall not exceed a rate of change of more than 500 cfs per hour.

ii. Project releases or bypasses that reduce streamflow downstream of Englebright Dam shall be gradual and, over the course of any 24-hour period, shall not be reduced below 70 percent of the prior day's average flow release or bypass flow.

iii. Once the daily project release or bypass level is achieved, fluctuations in the streamflow level downstream of Englebright Dam due to changes in project operations shall not vary up or down by more than 15 percent of the average daily flow.

iv. During the period from September 15 to October 31, the licensee shall not reduce the flow downstream of Englebright Dam to less than 55 percent of the maximum five-day average release or bypass level that has occurred during that September 15 to October 31 period or the minimum streamflow requirement that would otherwise apply, whichever is greater.

v. During the period from November 1 to March 31, the licensee shall not reduce the flow downstream of Englebright Dam to less than the minimum streamflow release or bypass established under (iv) above; or 65 percent of the maximum five-day average flow release or bypass that has occurred during that November 1 to March 31 period; or the minimum streamflow requirement that would otherwise apply, whichever is greater.

Article 34. The Licensee shall maintain a minimum pool in New Bullards Bar Reservoir at Elevation 1,730 ft.

Article 40. Consistent with the primary purpose of the power intakes in the New Bullards Bar Dam, the Licensee shall operate, within limits of the project, the multiple-level power intakes in New Bullards Dam to provide water of suitable quality in the Yuba River downstream from the New Narrows Power Plant for the production of anadromous fish as may be prescribed by the Commission upon the recommendations of the Director of the CDFG and the USFWS.

> **Article 46.** The Licensee shall operate the project reservoirs for flood control in accordance with rules prescribed by the secretary of the Army, such rules to be specified in a formal agreement between the Licensee and the District Engineer, U.S. Army Engineers District, Sacramento, California. Said agreement shall be subject to review from time to time at the request of either party; provided, however, that a different procedure of review may be prescribed by formal agreement.

With regards to Article 46, YCWA operates New Bullards Bar Reservoir from September 16 to May 31 to comply with Part 208 "*Flood Control Regulations, New Bullards Bar Dam and Reservoir, North Yuba River, California,*" pursuant to Section 7 of the Flood Control Act of 1944 (58 Stat. 890). Under the contract between the United States and YCWA that was entered into on May 9, 1966, YCWA agreed to reserve in New Bullards Bar Reservoir 170,000 ac-ft of storage space for flood control in accordance with rules and regulations enumerated in Appendix A of the *Report on Reservoir Regulation for Flood Control* (USACE 1972). The seasonal flood storage space allocation schedule is presented in Table 2.1-4 (specified values are for the end of each month).

Table 2.1-4. New Bullards Bar Reservoir flood storage space allocation in thousands of acre-feet.

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Storage Allocation	170	170	170	170	170	170	70	0	0	0	0	56

In addition to reservation of flood control space in New Bullards Bar Reservoir, the flood control regulations include rules governing ramping rates as well as target maximum flows in the Yuba River downstream of Englebright Dam and in the Feather River downstream of the confluence with the Yuba River.

YCWA also coordinates operations with PG&E's Narrows 1 Powerhouse downstream of Englebright Dam to use storage in Englebright Reservoir to capture winter storm freshets and reduce storm flows on the Yuba River. This operation is accomplished by evacuating storage space in Englebright Reservoir in anticipation of storm peak flows.

2.1.5.2 Measures in Other Licenses, Agreements and Contracts that Affect Operations

In addition to the current FERC license requirements, licenses, agreements and contracts include various streamflow-related requirements, which are summarized below. These licenses, agreements and contracts, and terms and conditions in them, affect Project operations, but are not part of the existing FERC license.

2.1.5.2.1 Lower Yuba River Accord (no expiration date in SWRCB Corrected Order Water Right 2008-0014)

In 2005, YCWA and 16 other interested parties signed memoranda of understanding that specify the terms of the Lower Yuba River Accord (Yuba Accord), a comprehensive, consensus-based program to protect and enhance aquatic habitat in the Yuba River downstream of Englebright Dam. Following environmental review, YCWA and parties executed the following four agreements in 2007, which together comprise the Yuba Accord: 1) the Lower Yuba River Fisheries Agreement, which specifies the Yuba Accord's lower Yuba River minimum streamflows and creates a detailed fisheries monitoring and evaluation program; 2) the Water Purchase Agreement, under which CDWR purchases water from YCWA, some of which is provided by the Yuba Accord's minimum streamflows, for CALFED's[17] Environmental Water Account and State Water Project and Central Valley Project contractors; 3) the Conjunctive Use Agreements with seven of YCWA's member units, which specify the terms of the Yuba Accord's groundwater conjunctive-use program; and 4) amendments to the 1966 Power Purchase Contract between YCWA and PG&E.

The Yuba Accord was developed by a multi-agency resource team, including representatives from NMFS, USFWS, CDFG, and a group of Non-Governmental Organizations (NGOs). Yuba Accord flow schedules 1 and 2 were developed to optimize habitat conditions for anadromous fish during high flow years. Schedule 6 flow schedules were developed to create the best habitat conditions for these fish that are possible during very low flow years, considering available water supplies and competing demands. Flow schedules 3, 4 and 5 then were developed by the resource team by using available water supplies to create habitat conditions during the months when additional flows (over Schedule 6 amounts) will provide the greatest benefits. The Yuba Accord also specifies requirements for "conference years," which are the very driest years, and are predicted to occur approximately one percent of the time.

YCWA has been operating the Project to implement the Yuba Accord since 2006. The 2006, 2007, and early 2008 operations were under 1-year pilot programs that were approved by the SWRCB through its Orders water right (WR) 2006-0009, WR 2006-0010, WR 2007-0002 and WR 2007-0012-DWR. Since 2008, YCWA has been operating the Project to implement the Yuba Accord according to the authorizations and requirements in SWRCB Corrected Order WR 2008-0014.

The Yuba Accord includes a specific set of flow schedules for the Yuba River. The flow schedule that is in effect at any particular time is determined by the North Yuba Index (NYI), a hydrologic index that was developed as a part of the Yuba Accord. The flow schedules are listed in Table 2.1-5. The NYI is shown in Figure 2.1-6.

[17] An interagency committee with management and regulatory responsibility for Bay-Delta Estuary.

Table 2.1-5. Yuba Accord flow schedules.

Schedule	Oct 1-15	Oct 16-30	Nov 1-30	Dec 1-31	Jan 1-31	Feb 1-29	Mar 1-31	Apr 1-15	Apr 16-30	May 1-15	May 16-31	Jun 1-15	Jun 16-30	Jul 1-31	Aug 1-31	Sep 1-30	Total Annual Vol. (ac-ft)
MARYSVILLE GAGE (cfs)																	
1	500	500	500	500	500	500	700	1,000	1,000	2,000	2,000	1,500	1,500	700	600	500	574,200
2	500	500	500	500	500	500	700	700	800	1,000	1,00	800	500	500	500	500	429,066
3	500	500	500	500	500	500	500	700	700	900	900	500	500	500	500	500	398,722
4	400	400	500	500	500	500	500	600	900	900	600	400	400	400	400	400	361, 944
5	400	400	500	500	500	500	500	500	600	600	400	400	400	400	400	400	334,818
6	350	350	350	350	350	350	350	350	500	500	400	300	150	150	150	350	232,155
SMARTSVILLE GAGE (cfs)																	
A	700	700	700	700	700	700	700	700	--	--	--	--	--	--	--	700	--
B	600	600	600	550	550	550	550	600	--	--	--	--	--	--	--	500	--

Notes:

Marysville Gage flows represent average volumes for the specified period. Actual flows may vary from the indicated flows according to established criteria.

Marysville Gage Schedule 6 flows do not include an additional 30,000 ac-ft that SWRCB Corrected Order WR 2008-0014 requires YCWA to make available through groundwater substitution transfers. These additional flows will be allocated during Schedule 6 years.

Smartsville Gage Schedule A is used with Marysville Schedules 1, 2, 3, and 4.

Smartsville Gage Schedule B is used with Marysville Schedules 5 and 6.

FLOW SCHEDULE YEAR TYPES
BASED ON THE NORTH YUBA INDEX
FOR ESTABLISHING REQUIRED FLOWS IN THE LOWER YUBA RIVER FISHERIES AGREEMENT

The water year hydrologic classification for the Yuba River to determine the flow requirements of Yuba County Water Agency's water right permits shall be based on the North Yuba Index. Determinations of a year's flow schedule year type shall be made in February, March, April, and May and for any subsequent updates.

Flow Schedule Year Type	North Yuba Index Thousand Acre-Feet (TAF)
Schedule 1	Equal to or greater than 1400
Schedule 2	Equal to or greater than 1040 and less than 1400
Schedule 3	Equal to or greater than 920 and less than 1040
Schedule 4	Equal to or greater than 820 and less than 920
Schedule 5	Equal to or greater than 693 and less than 820
Schedule 6	Equal to or greater than 500 and less than 693
Conference Year	Less than 500

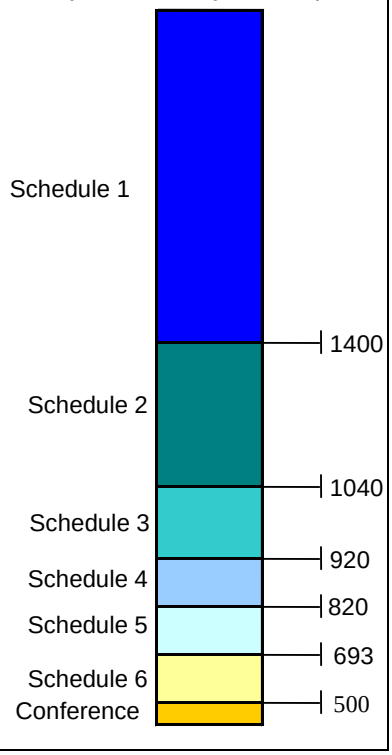

Figure 2.1-6. Yuba Accord North Yuba Water Year Type Index.

During Conference Years, which are defined as years when the NYI is less than 500,000 ac-ft, and which are expected to occur approximately 1 percent of the time, YCWA is required: 1) to maintain minimum instream flows in the Yuba River at the levels specified in Article 33 of YCWA's existing FERC license without the reductions authorized by subsections (c) and (d) of that article; 2) to release any supplemental flows recommended by the Lower Yuba Accord River Management Team (RMT) and approved by the SWRCB's Deputy Director for Water Rights or, if no such recommended flows are effective by April 11 of such a Conference Year, then to release any supplemental flows ordered by the SWRCB, after a hearing under California Code of Regulations, title 23, section 767; and 3) to limit total water supply diversions at Daguerre Point Dam to 250,000 ac-ft.

As stated above, YCWA has operated the Project in compliance with the Yuba Accord since 2006.

2.1.5.2.2 YCWA's Water Rights for Power (No Expiration Date)

YCWA holds pre-1914 appropriative rights dating from 1897 and post-1914 appropriative water rights confirmed by water-right licenses, for the purposes of operating the Project for hydroelectric power generation. Table 2.1-6 lists the post-1914 appropriative water-right licenses held by YCWA for power generation.

Table 2.1-6. Water right licenses held by YCWA for operation of the Project for power generation.

Priority (date)	SWRCB Designation (application)	SWRCB Designation (license)	Source (Waterbody)	Amount & Place of Diversion or Storage (amount & place)		Season (period)		Place of Beneficial Use (powerhouse)
2/11/1921	2197	435	North Yuba River	700 cfs at New Bullards Bar Dam		1/1 - 12/31		New Colgate Powerhouse
				5,000 ac-ft/yr at New Bullards Bar Dam		about 12/15 to about 7/15		
9/7/1922	3026	436	North Yuba River	10,000 ac-ft/yr at New Bullards Bar Dam		about 12/15 to about 7/15		New Colgate Powerhouse
4/30/1926	5004	777	North Yuba River	15,000 ac-ft/yr at New Bullards Bar Dam		about 12/15 to about 7/15		New Colgate Powerhouse
7/30/1927	5631	11565	Middle Yuba River	810 cfs at Our House Dam	490,000 ac-ft/yr storage in New Bullards Bar Res	1/1-12/31 (dir. div.)	10/15 to 6/30 (stor.)	New Colgate Powerhouse and Narrows 2 Powerhouse
			Oregon Creek	240 cfs at Log Cabin Dam		1/1-12/31 (dir. div.)		
			North Yuba River	1,800 cfs at New Bullards Bar Dam		11/1-7/31 (dir. div.)		
			Yuba River	1,800 cfs at USACE's Englebright Dam		1/1- 12/31		
3/1/1939	9516	3050	North Yuba River	100 cfs at New Bullards Bar Dam		1/1 - 12/31		New Colgate Powerhouse
9/12/1941	10282	5544	North Yuba River	5,335 ac-ft/yr at New Bullards Bar Dam		about 10/1 to about 3/1		New Colgate Powerhouse
								Narrows 2 Powerhouse

Table 2.1-6. (continued)

Priority (date)	SWRCB Designation (application)	SWRCB Designation (license)	Source (Waterbody)	Amount & Place of Diversion or Storage (amount & place)		Season (period)	Place of Beneficial Use (powerhouse)
2/20/1953	15205	11566	Middle Yuba River	3,200 ac-ft/yr at Log Cabin Dam; storage in New Bullards Bar Res.		5/1- 6/30	New Colgate Powerhouse and Narrows 2 Powerhouse
			North Yuba River	245 cfs and 700 ac-ft/yr at New Bullards Bar Dam		3/15- 6/15 (dir. div.); 5/1- 6/30 (stor.)	
			Yuba River	800 cfs at USACE's Englebright Dam		11/1-7/15	
10/2/1953	15563	11567	Middle Yuba River	30,000 ac-ft/yr at Our House Dam	all storage in New Bullards Bar Res.	10/15 - 6/30	New Colgate Powerhouse and Narrows 2 Powerhouse
			Oregon Creek	1,400 ac-ft/yr at Log Cabin Dam		10/15 - 6/30	
			North Yuba River	146,000 ac-ft/yr at New Bullards Bar Dam		10/15 - 6/30	
			Yuba River	910 cfs at USACE's Englebright Dam		11/1 - 6/30	

YCWA operates the Project consistent with the terms and conditions of the above water rights.

2.1.5.2.3 1965 Cal Fish and Game Agreement (has been fully implemented)

On September 2, 1965, YCWA and the California Department of Fish and Game (i.e., now Cal Fish and Wildlife) entered into an agreement regarding the Project. This agreement specifies the Project minimum flow requirements that subsequently were adopted in Article 33 of the FERC license and YCWA's water-right permits. While this agreement does not have a termination date, it was fully implemented when the Commission adopted Article 33 and the SWRCB included the agreement's provisions in YCWA's water-right permits.

2.1.5.2.4 Water Supply Deliveries

Within the Project Area, YCWA pumps some water directly from New Bullards Bar Reservoir to supply water to the Cottage Creek Water Treatment Plant for domestic and recreational uses adjacent to the reservoir. The amount of this pumping averages approximately 6 ac-ft per year, which does not affect Project operations. YCWA anticipates that pumping of this small amount of water will continue during the period of the new license.

Downstream of the Project, water is diverted under YCWA's consumptive-use water-right permits to eight water users, which are collectively referred to as the YCWA Member Units. The places of water delivery to YCWA's Member Units are listed in Table 2.1-7. The YCWA Member Unit service areas are shown in Figure 2.1-7.

Table 2.1-7. YCWA's annual contract amounts and place of delivery.

Member Unit	Base Contract (ac-ft)	Supplemental Contract (ac-ft)	Total Contract (ac-ft)	Member Unit Water Rights (ac-ft)	Total Contract and Water Rights (ac-ft)
BROWNS VALLEY IRRIGATION DISTRICT PUMPLINE DIVERSION FACILITY					
Browns Valley Irrigation District[1]	9,500	--	9,500	24,462[1]	33,962
SOUTH CANAL[2]					
Brophy Water District	43,470	32,177	75,647	--	75,647
South Yuba Water District	25,487	18,843	44,330	--	44,330
Dry Creek Mutual Water Company[2]	13,682	3,061	16,743	--	16,743
Wheatland Water District[3]	23,092	17,138	40,230	--	40,230
NORTH CANAL[4]					
Cordua Irrigation District	12,000	--	12,000	60,000	72,000
Hallwood Irrigation Company	--	--	--	78,000	78,000
Ramirez Water District	14,790	10,311	25,101	--	25,101
Total	**142,021**	**81,530**	**223,551**	**162,462**	**386,013**

[1] BVID receives water at the Pumpline Diversion Facility, located 1 mile upstream from USACE's Daguerre Point Dam.

[2] BWD, SYWD, DCMWC and WWD receive water from the South Yuba Canal (South Canal), which begins on the south side of the Yuba River slightly upstream of the south abutment of USACE's Daguerre Point Dam.

[3] Includes both Phase 1 and Phase 2 of the Wheatland Project.

[4] CID, HIC and RWD receive water through the Hallwood-Cordua Canal (North Canal), located on the north abutment of USACE's Daguerre Point Dam.

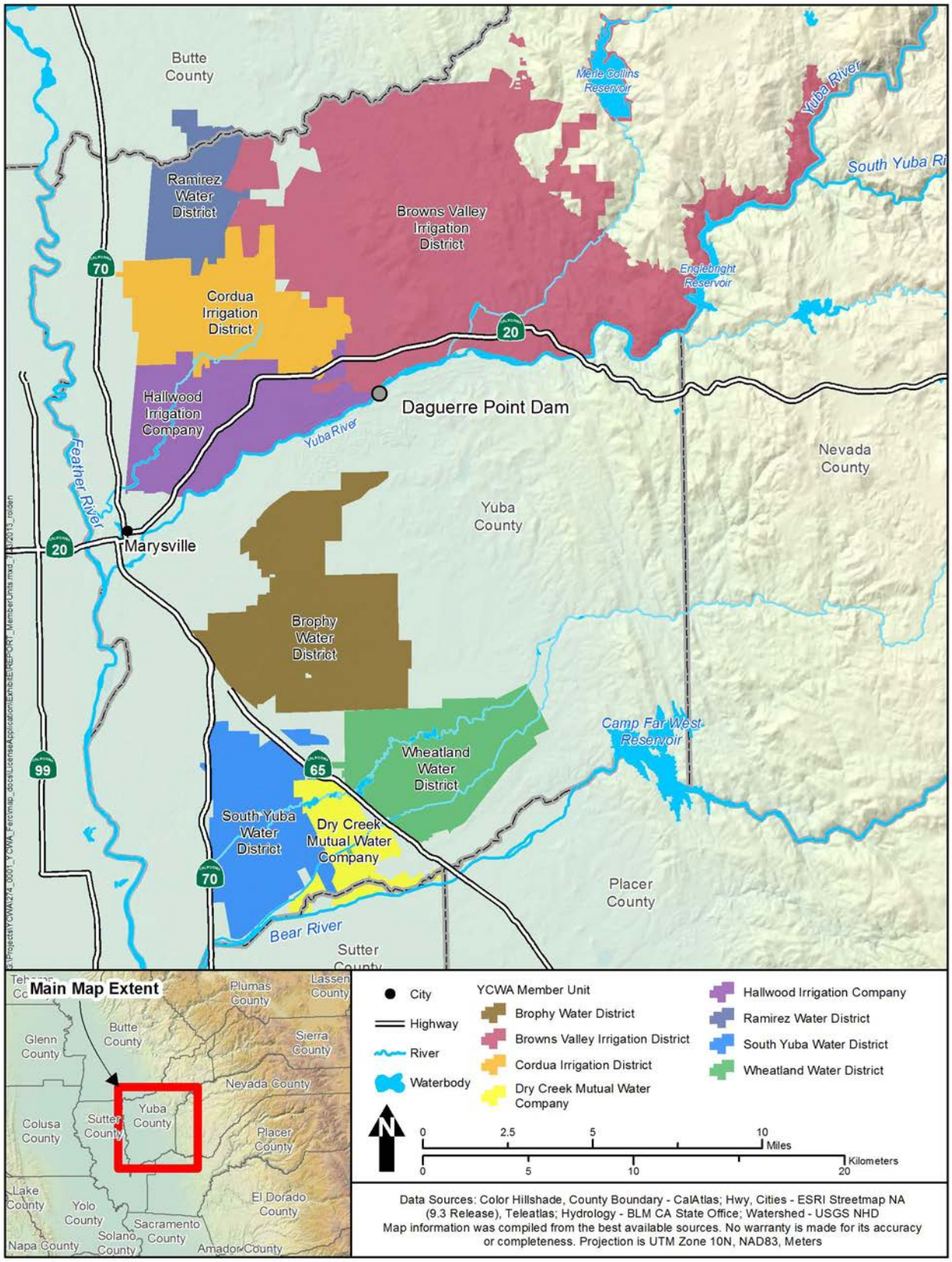

Figure 2.1-7. YCWA's Member Unit service areas.

BVID, CID, and HIC have their own water rights on the Yuba River. Under settlement contracts with YCWA, CID and HIC receive surface water supplies as part of Project operations. Dry year deficiency criteria in these contracts are different from the deficiency criteria in YCWA's contracts with other member units. Provisions in YCWA's water right settlement contracts preclude deficiencies in water right settlement deliveries unless CDWR April forecast of unimpaired runoff as measured at the Smartsville gage is less than 40 percent of average. No deficiencies in such deliveries may be imposed on BVID. Contract shortage provisions are presented in Table 2.1-8.

Table 2.1-8. YCWA's water supply contract shortage provisions.

Category	Unimpaired Runoff Forecast (f)[1]	Percentage of Settlement/ Contract Allocation Available
PRE-1914 RIGHTS SETTLEMENTS		
Base Project Water for Other Member Units	$f > 85\%$	100%
	$50\% < f \leq 85\%$	85%
	$40\% \leq f \leq 50\%$	70%
	$f < 40\%$	50%
Browns Valley Irrigation District	All	100%
Cordua Irrigation District	$f \geq 40\%$	100%
Hallwood Irrigation Company	$f < 40\%$	80%
YCWA SUPPLY CONTRACTS		
Supplemental Water	All forecasts	Determined annually by Licensee in its reasonable discretion considering forecasted runoff and operational conditions.

[1] April 1 CDWR forecast of unimpaired Yuba River runoff near Smartsville in percentage of 50-year average.

YCWA's contract allocations are based on the gross acreage served by each member unit. The maximum "Base Project Water" allocation is computed by multiplying 90 percent of the gross acreage by 2.87 ac-ft per acre. The maximum "Supplemental Water Supply" is computed by multiplying 90 percent of the gross acreage by 2.13 ac-ft per acre. For member units that have water rights senior to YCWA's, their contract allocations are based on their water right amounts.

In 2009, YCWA started providing water to the WWD under a water service contract. Until then, water users within WWD relied solely on groundwater for irrigation. The Wheatland Project now conveys surface water, diverted by YCWA at Daguerre Point Dam, to WWD through the South Canal system. The Wheatland Project is being constructed in two phases. Phase 1, which was completed in 2009, provides for delivery of surface water to WWD and the immediate irrigation of approximately 7,750 ac of the approximately 9,200 ac that will be served upon the completion of both phases. Under Phase 1, WWD's contract with YCWA provides for a total allocation (base and supplemental) of 23,092 ac-ft per year. When Phase 2 is completed, this contract will allow for a total allocation (base and supplemental) of 40,230 ac-ft per year.

2.1.5.2.5 Davis-Grunsky Agreement (Expires December 31, 2014)

On May 10, 1966, YCWA and the State of California entered into an agreement under the Davis-Grunsky Act regarding the Project. Among other provisions, this agreement requires YCWA to operate the Project to maintain the minimum flows specified in Articles 33 and 34 of the FERC license. The agreement was amended on August 14, 1973 and August 14, 2003. The term of the agreement ends on December 31, 2014.

2.2 YCWA's Proposal

Provided below is a description of YCWA's proposed Project. This section describes YCWA's proposed Project facilities (Section 2.2.1), 2) YCWA's proposed FERC Project Boundary (Section 2.2.2), 3) YCWA's proposed Project operations (Section 2.2.3), and 4) YCWA's proposed environmental measures that would be part of the new FERC license (Section 2.2.4).

2.2.1 Proposed Project Facilities

2.2.1.1 Generation Facilities

2.2.1.1.1 New Colgate Powerhouse Tailwater Depression System

YCWA proposes to add to the Project a new TDS at the New Colgate Powerhouse. The TDS will introduce compressed air into the turbine discharge chamber to lower the tailwater to a level that does not interfere with turbine operation, thereby allowing continued turbine operation during high flows. The TDS will thus enhance the ability to regulate flood releases from New Bullards Bar Reservoir and increase the production of energy.

Figure 2.2-1, -2 and -3 are conceptual-level plan and profile drawings of the New Colgate Powerhouse TDS. If approved, detailed drawings would be provided to the Commission as appropriate for FERC approval.

Figure 19

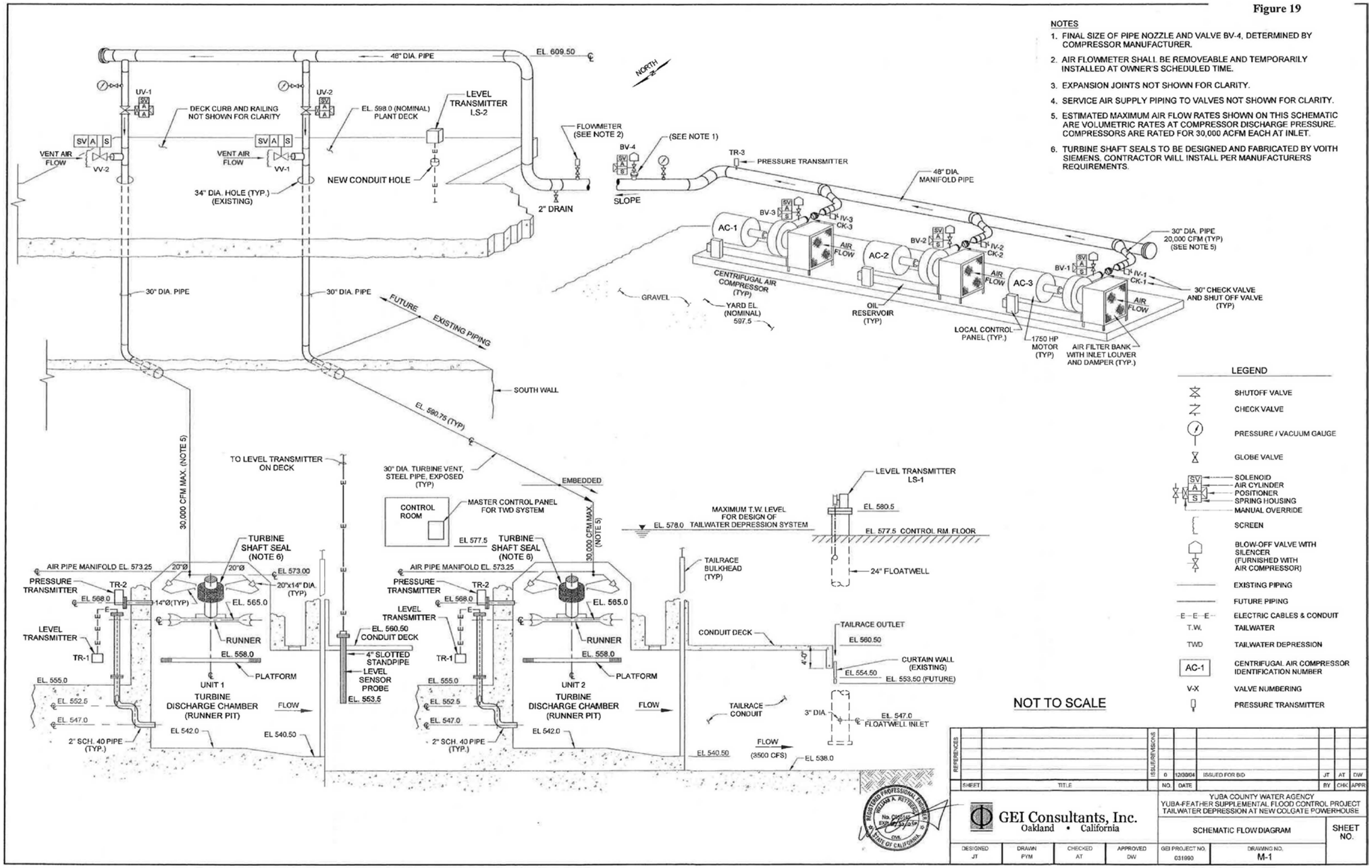

Figure 2.2-1. Schematic flow diagram for YCWA's proposed New Colgate Powerhouse TDS.

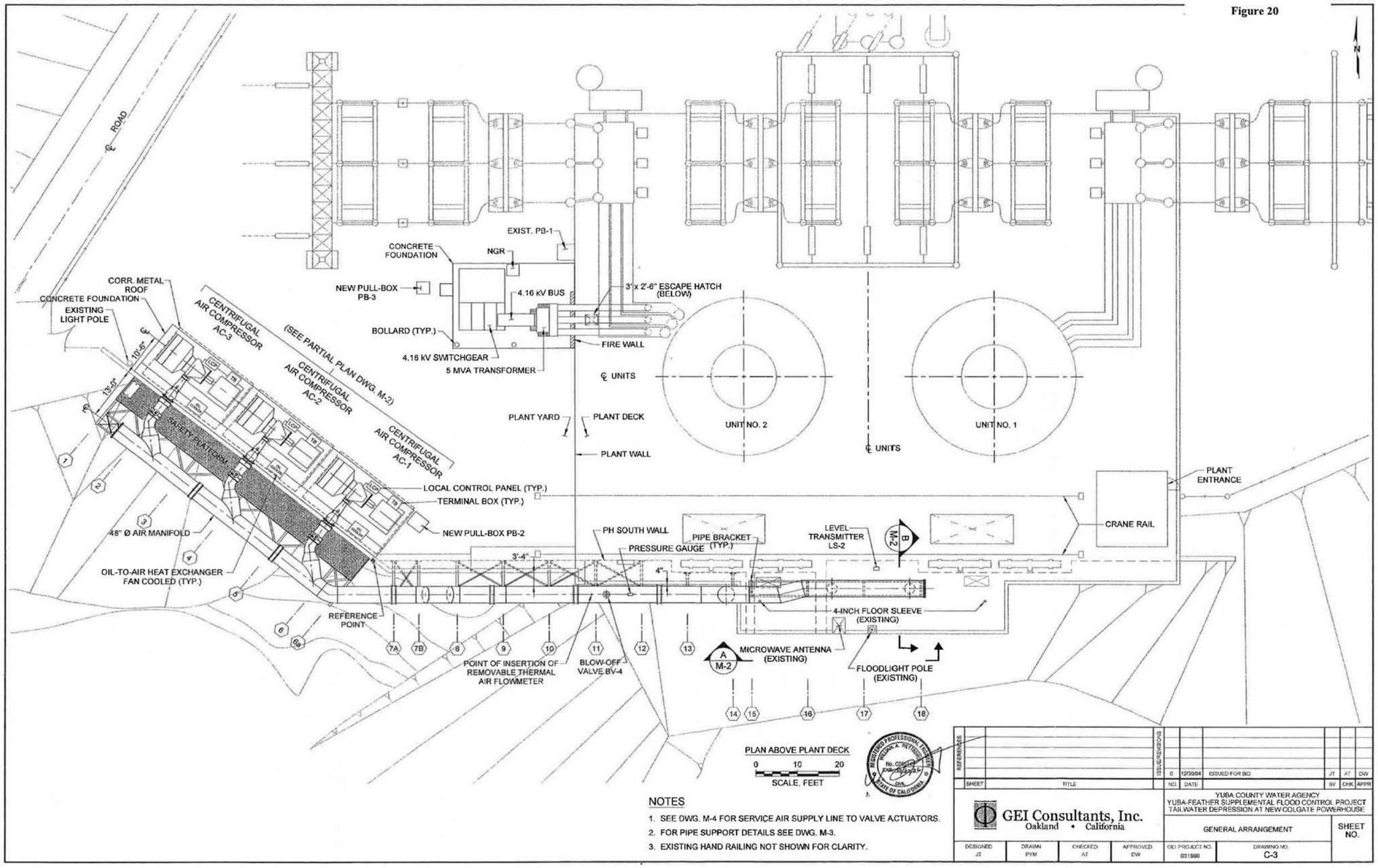

Figure 2.2-2. General arrangement for YCWA's proposed New Colgate Powerhouse TDS.

Figure 21

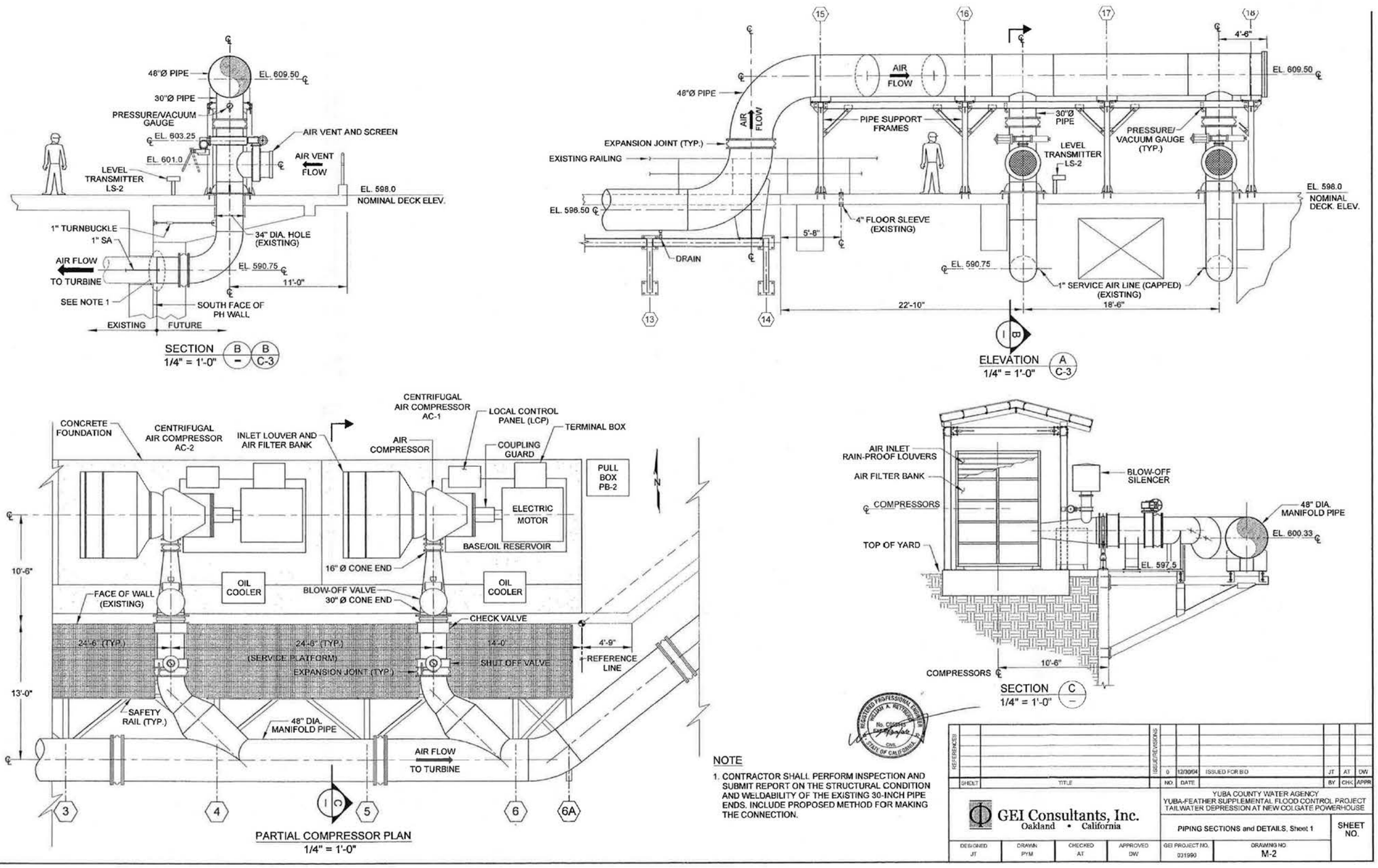

Figure 2.2-3. Piping sections and details for YCWA's proposed New Colgate Powerhouse TDS.

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The anticipated total duration of the construction is 5 months, and YCWA anticipates that the work can be accomplished during planned outages. Key construction activities would include the following:

- Site preparation at powerhouse yard and deck, including construction of equipment foundations and relocation of the New Colgate Powerhouse pedestrian bypass.
- Installation of blowers, pipe supports, roofing, air piping and valves
- Installation of power supply, including the tap of the 13.8-kilovolt (kV) isolated phase bus, transformer, switchgear and cables to the blowers.
- Installation of turbine shaft seals
- Curtain wall modifications
- Installation of bulkhead shaft seal
- Installation of instrumentation and controls
- System testing and startup including construction and removal of temporary test barrier

The construction labor force is estimated to average about 12 persons over the total construction period. Equipment will be transported to the powerhouse via Highway 20, Marysville Road, and Lake Francis Road, all of which are paved and suitable for the anticipated loads. It is anticipated that not more than 30 trailer ("low boy") truck roundtrips will be required to bring the blower skids, transformer, other electrical gear, pipe, structural steel and other heavy materials and equipment. About 15 to 20 truckloads of ready-mixed concrete may be needed for equipment pads, foundations and curbs. No changes in road conditions are anticipated as a result of the work.

At the site, typical heavy construction equipment will include an excavator (backhoe), an air compressor, one or two trucks, two truck-mounted cranes, pickup trucks, and miscellaneous equipment. Smaller equipment will include hoists and platforms, concrete placing and drilling equipment, a welding machine, pipe fitting equipment, and other miscellaneous equipment customary to the electrical, mechanical and structural crafts.

No borrow areas are anticipated to be required because the work does not entail significant earthwork. It is expected that the available space within the fenced plant area will be sufficient for laydown and staging of materials and equipment. All work will be confined to the powerhouse, yard and immediate vicinity. No undisturbed areas are anticipated to be disturbed as a result of the work.

YCWA does not propose to add to the Project any previously constructed, unlicensed water power structures or facilities, or any new generation facilities.

2.2.1.2 Non-Generation Facilities

2.2.1.2.1 New Bullards Bar Dam Flood Control Outlet

YCWA proposes to construct a new flood control outlet on New Bullards Bar Dam, to be located south of the existing New Bullards Bar Dam spillway centerline in the upper left abutment area of the dam. The primary benefit of the new flood control outlet is increased flood control. As configured at this time, the new outlet would have a discharge capacity at the bottom of the New Bullards Bar flood pool (El. 1,918 ft) and at the NMWSE (El. 1,956 ft) of approximately 66,000 cfs and 45,000 cfs, respectively. The outlet would include:

- An excavated approach channel to the intake structure, with right and left wing walls.
- A reinforced-concrete intake control structure at the end of the approach channel containing intake gates and hydraulic hoists. The intake would be a 70-foot-wide reinforced-concrete structure extending from the approach channel invert at elevation 1,865 ft to a deck at elevation 1,970 ft. It would be located in a rock excavation at the downstream end of the approach channel. The intake structure would have three 17-ft-wide, 30-ft-high gate openings separated by 4.5-ft wide concrete piers. The gates would be roller-type gates operated by hydraulic cylinders. The gates would be operated using hydraulic cylinders installed on the top deck.
- Intake area site works including a fenced, paved parking area adjacent to the intake structure deck, access to Marysville Road, and riprap erosion protection of the finished slopes.
- A 540-ft-long concrete-lined conveyance tunnel. The tunnel would be concrete-lined and horseshoe-shaped, with net opening dimensions of 25 ft in height by 26 ft in width.
- A concrete outlet structure including the tunnel outlet portal, a 60-ft-long open channel and 27-ft-long flip-bucket energy dissipater at the end of the open channel, which would deflect the discharging water jet away from the foundation area and toward the river canyon. The flip-bucket structure would be founded and bolted to rock to resist the hydrodynamic forces and vibrations. A cutoff would be provided to protect the flip bucket foundation from scour. The area between the flip bucket and the river would be cleared of all vegetation, overburden and loose weathered rock down to sound rock.
- A 2,900-ft-long construction access road from an existing forest road to the outlet structure.
- Power supply to the intake for operation and control of the gates.

Figure 2.2-4 shows conceptual-level plan and profile drawings of the new flood control outlet. If approved, detailed drawings would be provided to the Commission as appropriate for FERC approval.

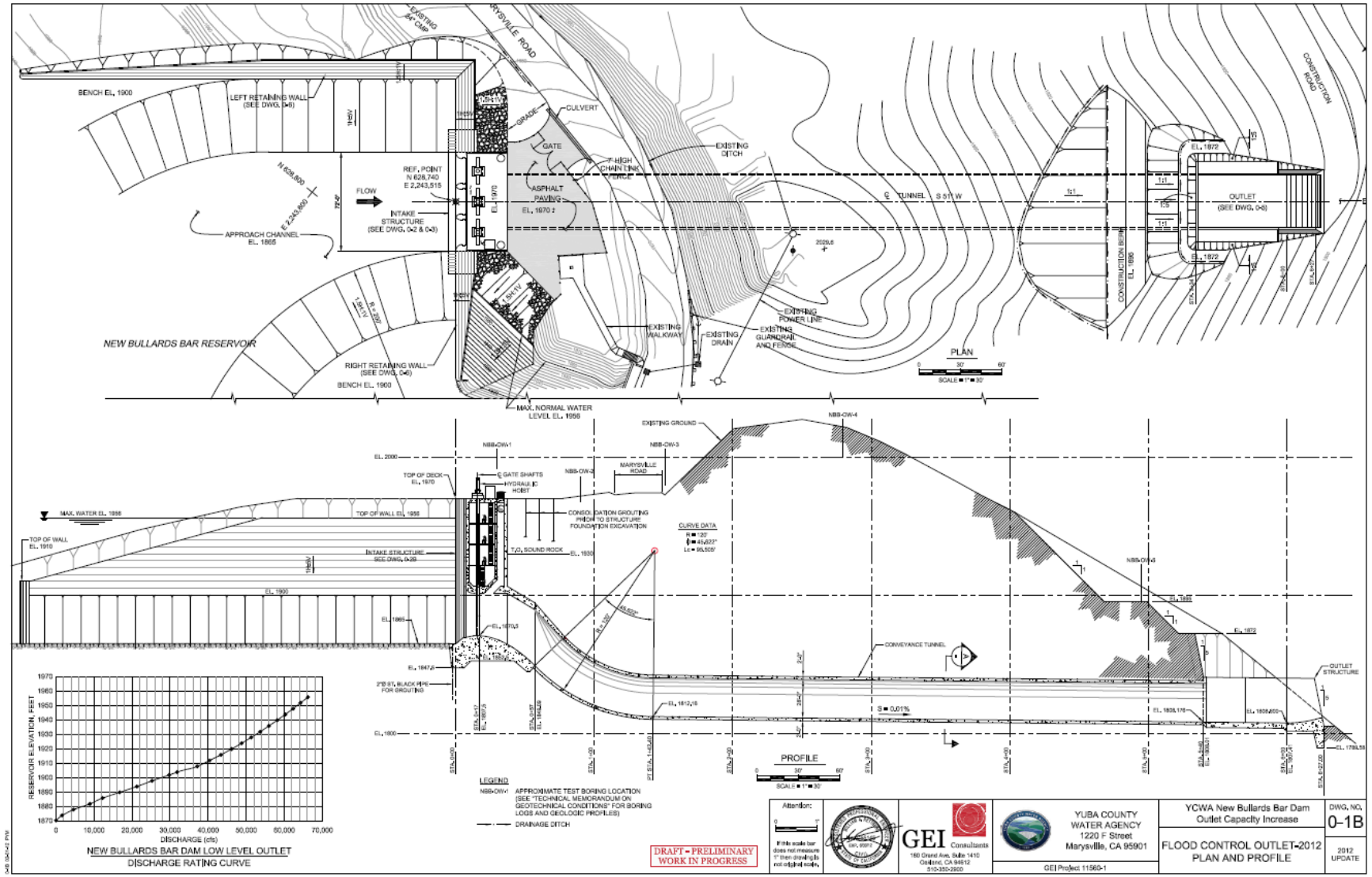

Figure 2.2-4. Conceptual level plan and profile for YCWA's proposed New Bullards Bar Dam flood control outlet.

Outlet construction would require excavation in the upper left abutment area of the dam site. To serve tunnel construction, a construction access road would be built from the left abutment area down to the outlet area. Tunnel construction would likely start from the downstream portal and would continue toward the upstream portal using conventional, staged and drill-and-blast excavation methods. Temporary tunnel support would be installed during excavation as needed.

It is anticipated that excavation for the intake structure would be performed concurrently with access road construction and/or tunnel excavation. A natural cofferdam (i.e., *in-situ* soil and rock) would be left in place in the inlet approach channel to protect the construction work and prevent uncontrolled release of reservoir water through the excavation area and tunnel. The natural cofferdam would likely need stabilization and buttressing measures to ensure the site is adequately protected from the reservoir.

After the concrete intake structure is completed, the over-excavated areas would be backfilled with structural fill, and riprap would be placed on the slopes that may be exposed to wave erosion.

The natural cofferdam would be left in place until the tunnel and intake structure are completed and the gates installed. Removal of the cofferdam and construction of the approach channel and inlet training walls would be performed during a low reservoir period (late summer/fall).

Work on all components of the project including the approach channel, intake structure, tunnel, and outlet structure, would be completed with only temporary disruptions of normal traffic patterns along Marysville Road due to movement of heavy construction equipment (e.g., excavators, haul trucks, concrete trucks and cranes). Some short duration (i.e., five- to 15-minute) road closures may be required when setting up or unloading large equipment.

Construction Laydown Areas

Laydown/staging areas are temporary facilities utilized during construction activities. Temporary construction facilities would likely include construction offices, worker and equipment parking, equipment maintenance yard, warehouse, fuel tank and fueling pad, aggregate processing plant, concrete batch plant including portable plant, bulk material silos (cement, fly ash), admixtures and aggregate piles, and temporary storage of other construction materials.

Potential laydown areas include: 1) east of visitor parking area adjacent to spillway on YCWA land (~4 ac); 2) flat area on north side of Marysville Road west of quarry on NFS land (~15 ac); 3) flat area on south side of Marysville Road south of quarry on private land (~20 ac); 4) southeast of dam along dirt forest road on YCWA land (~16 ac); 5) alongside Marysville Road, east of quarry on private land (~6 ac on YCWA and private land); 6) east side of Marysville Road, east of quarry on private land (1.5 ac on YCWA and private land); and 7) west side of parking area on right abutment on YCWA land (~2 ac).

Construction Disposal Areas

Disposal areas will be required for the permanent placement of excess excavated materials obtained during construction activities. Material placed in the disposal areas would consist of soil and rock from required excavation, including tunnel muck. Woody debris may also be placed in disposal areas. Material not suited for onsite disposal (e.g., petroleum products, trash and waste) would be hauled to an approved offsite disposal facility.

The estimated total quantity of excavated material, including an appropriate bulking factor, is approximately 300,000 cubic yards (cu yds). The materials obtained from required excavations would primarily consist of soil and metavolcanic rock. Materials from excavation may, in part, be suitable for utilization as backfill, road and yard surfacing, concrete aggregate, and riprap. Some sorting, stockpiling and processing of excavated materials will be required to make them suitable for various intended uses. Excess, as well as materials that are unsuitable for reuse in construction, will be placed in the disposal areas.

Potential disposal areas include: 1) east of visitor parking area adjacent to spillway on YCWA land (~4 ac with a capacity of ~80,000 cu yds); 2) old quarry on NFS land and private land (~8 ac and 100,000 cu yds); 3) flat area on north side of Marysville Road west of quarry on NFS land (~15 ac and 100,000 cu yds); 4) flat area on south side of Marysville Road south of quarry on private land (~20 ac and 100,000 cu yds); and 5) southeast of dam along dirt forest road on YCWA land (~16 ac and 100,000 cu yds).

Construction Traffic Considerations

The construction labor force is estimated to average about 30 to 40 persons over an assumed 3-year construction period. Peak manpower could be close to double this number depending on the contractor's schedule. Personnel and equipment would reach the site via Highway 20 or 49 and Marysville Road, which are paved and suitable for the anticipated loads.

Construction Schedule

A possible construction sequence, involving an approximately 6-year construction period is summarized below. The primary long-lead item is the fabricated steel roller gates together with the hydraulic cylinder operators and hydraulic power units. Schedule highlights are as follows:

- At this time, it is anticipated that environmental compliance/permitting will take a total of 3 years, and the design will take 2 years. YCWA anticipates compliance/permitting and design will be completed in parallel, so the total time for these two activities totals 3 years.
- Mobilization would include the setup of construction offices, an aggregate crushing plant and a concrete batch plant; the development of disposal and laydown areas; and the construction of the access road to the outlet. It is anticipated that these activities may take about 3 months.

- The schedule assumes that YCWA would bid the roller gate package separately from the construction package to expedite the gate procurement. However, the construction contractor could be assigned the procurement contract upon award of the construction contract. The gate procurement cycle, from prime contract award to gate delivery at the site is expected to take 14 months.
- Tunnel excavation would begin after completion of the access road, working from the downstream portal towards the inlet. Rock from tunnel excavation would be hauled to the disposal area, or to a stockpile in a laydown area for later use as concrete aggregate. It is expected that tunnel excavation may take about 4 months.
- Intake structure excavation would be conducted concurrently with construction of the access road and tunnel excavation. The intake excavation is expected to take about 2 to 3 months.
- After tunnel excavation, the reinforced-concrete tunnel lining would be constructed working from the inlet area towards the downstream portal. Once the upstream portion of the tunnel is lined, construction of the intake structure could begin, and could be constructed concurrently with the rest of the tunnel lining. It is anticipated that the tunnel lining and construction of the transition/intake structure would take about 4 to 5 months and 5 to 6 months, respectively.
- The reinforced-concrete outlet channel and flip bucket structure would be constructed after the tunnel lining is completed. This activity may take about 3 to 4 months.
- The roller gates would be installed after completion of the intake structure construction. Gate installation may take about 2 to 3 months to complete.
- Excavation of the approach channel would be performed once the intake structure is in an advanced stage of completion and the reservoir level is sufficiently low. After the approach channel is excavated, the reinforced concrete training walls and slope protection would be constructed. These activities would take about 4 months to complete.

The above summary schedule assumes that the financing plan for the project is in place before award of the construction contract. Also, seasonal schedule constraints that may be imposed by environmental mitigation requirements are not reflected in the summary above.

Figure 2.2-5 is a conceptual-level map of the construction area, as anticipated at this time.

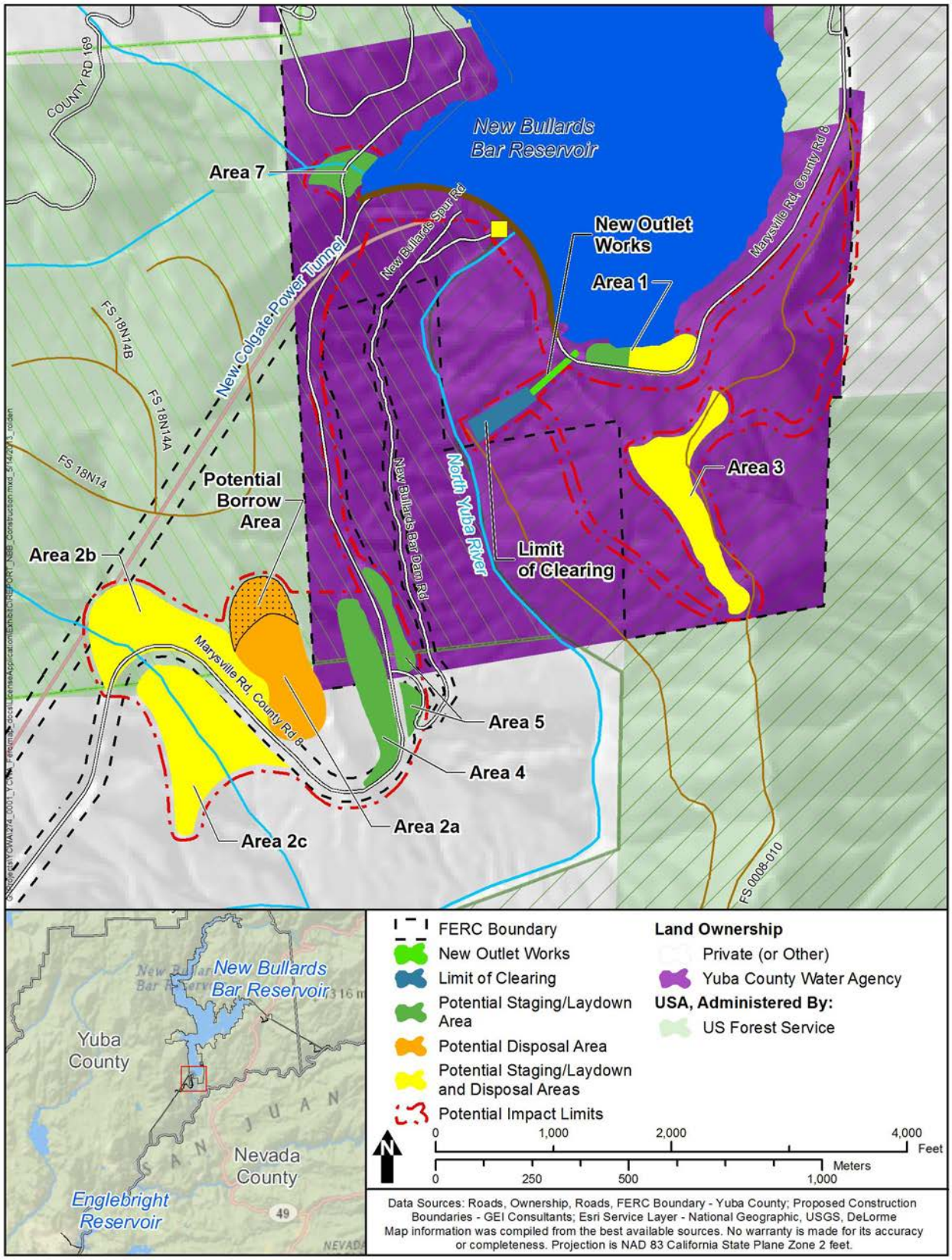

Figure 2.2-5. Construction area for YCWA's proposed New Bullards Bar flood control outlet.

2.2.1.2.2 Recreation Facilities

YCWA proposes several enhancements to the existing Project recreation facilities. When constructing Project recreation facilities, YCWA will obtain all necessary permits and approval for survey work, facility design and on-site resource evaluations, including the Forest Service on NFS land.

A description of these enhancements is provided below.

Schoolhouse Campground

- Replace the lone existing vault restroom (2-unit) with an efficient flush model (including appropriate septic system), if the addition of the flush facility does not exceed the existing water system capacity.
- Convert the double and triple campsites to single campsites.
- Upgrade the host site with water and electric hookups and a septic tank.
- Provide electricity at the entrance kiosk/information board, host site, RV campsites and each restroom.
- Develop up to 12 RV campsites with water and electric hookups. The final number of RV campsites may change during site design due to terrain and road turning radius limitations.
- Restrict RV size at the campground to a 30 ft length, except where RVs up to 40 ft length may be accommodated without 1) significantly re-designing the existing campground circulation road; and 2) reducing the total number of existing campsites.
- Provide appropriate trailhead signage on the facility entrance sign.

Dark Day Campground

- Replace the existing vault restrooms with efficient flush models and sizes that meet Forest Service capacities (including appropriate septic system), if the addition of these flush facilities do not exceed the existing water system capacity
- Convert the double and triple campsites to single campsites
- Expand the capacity by two single campsites, as feasible

Hornswoggle Group Campground

- Replace the existing 4-unit flush restrooms at the Manzanita and Madrone campsites with efficient 2-unit flush models
- Replace the existing, 2-unit vault restrooms at the Sugarpine and Douglas Fir campsites with efficient 1-unit models (including appropriate septic system), if the addition of these flush facilities do not exceed the existing water system capacity

- Install an efficient 1-unit flush restroom at Dogwood and Ponderosa campsites (where restrooms do not currently exist), if the addition of these flush facilities do not exceed the existing water system capacity
- Restrict RV size at the campground to a 30 ft length, except where RVs up to 40 ft length may be accommodated without significantly re-designing the existing campground circulation roads
- Expand the capacity by one group campsite (25-50 PAOT), including a parking area, restroom, and group camping area
- Provide electricity at the entrance kiosk/information board and each restroom

Cottage Creek Campground

- Re-develop the site as a group campground to meet small group camping needs with the following facilities and specifications.
  - Provide a total of four small group campsites consisting of two 12-PAOT sites and two 18-PAOT sites.
  - Provide a group living area with a group fire ring, picnic tables and food lockers at each campsite
  - Provide a paved parking area with spaces designed for a vehicle with a boat trailer for each campsite
  - Provide an appropriate number (and size) of efficient flush restrooms that meets the standards at the time of design, including lighting (interior and exterior) at the restrooms
  - Provide a potable water delivery and distribution system

Garden Point Boat-in Campground

- Expand the site capacity by at least five single campsites
- Install additional restrooms that meets the needs of the final number of new campsites developed

Frenchy Point Boat-in Campground

- Decommission the facility due to low use

Dark Day Picnic Area

- Replace the existing vault restroom with an efficient flush model (including appropriate septic system), if the addition of the flush facility does not exceed the existing water system capacity

- Expand the parking area to provide a total of 25 single spaces
- Improve shoreline access, including developing trails and signage
- Recommend a county ordinance establishing a non-motorized boating only zone in the cove to west of the picnic area peninsula
- Remove the Klamath stoves

Sunset Vista Point

- Replace the vault restroom with an efficient flush model (including appropriate septic system), if the addition of the flush facility does not exceed the existing water system capacity
- Install two additional picnic sites, each with a picnic table and a concrete grill with self-contained ash box
- Upgrade the existing picnic site by replacing the picnic table and installing a concrete grill with self-contained ash box
- Enhance the vistas of the reservoir from each picnic site by clearing vegetation per the guidelines in YCWA's Visual Management Plan
- Delineate each parking space, but maintain the existing gravel parking surface; except at the accessible parking spaces (number to be determined during site design), which will be a paved or concrete surface
- Delineate the parking spaces/areas for the vista/picnic visitors and trailhead users
- Improve signage on the entrance sign and all information boards to include all recreational uses at the facility
- Provide a 3-panel interpretive display that includes, at a minimum, information on the Project history and purpose as well as other relevant local/area history

Dam Overlook

- Install an information board identifying the Project recreational facilities and opportunities, including a map

Moran Road Day Use Area

- Develop a turnaround along the car top boat ramp below the high water line designed for vehicles only

Dark Day Boat Launch

- Replace the existing vault restroom with an efficient flush model (including appropriate septic system), if the addition of the flush facility does not exceed the existing water system capacity
- Repair the erosion uphill of the concrete boat ramp

Recreational Trails (Bullards Bar and Schoolhouse Trails)

- Install consistent signage at all Project trailheads, including a: 1) trailhead symbol or identification sign at all facility entrance signs where trailheads are located; 2) trailhead identification sign at all trailhead parking areas; and trailhead information board with trail map and information
- Install consistent directional signage at all Project trail junctions

Recreational Water System

- Remove the Forest Service administrative site, including a maintenance warehouse, barracks, and residences, from the Project's recreational water supply system. The water supply system, is for the sole purpose of serving the recreation area, and the administrative site is not part of the recreation area.

Decommissioned Burnt Bridge Campground

- Remove the decommissioned facility from the Project Boundary since the facility has already been decommissioned as part of the existing license per an August 19, 1993 FERC Order.[18]

Implementation Schedule for Recreation Enhancements and Major Rehabilitation

YCWA's proposed Recreation Facilities Plan (Condition RR1) includes a detailed implementation schedule for major rehabilitation, near-term rehabilitation and enhancements at each existing recreation facility. It is important to understand how YCWA developed this schedule. YCWA used the replacement of the existing main line of the recreational facility water delivery system, which is almost entirely underground, as the primary driver of the major rehabilitation schedule of the recreation facilities. The rationale for this approach is primarily the efficiency of the work and to avoid doubling rehabilitation efforts and the resultant significant cost savings. Further, replacement of the underground water system is the single most impactful work project at each facility because the work would affect the most significant (and costly to replace) facilities and amenities within the recreation facilities – the circulation

[18] Removal of this site from the Project Boundary will occur as part of YCWA's proposed redefining of the boundary around the Project reservoir and impoundments from surveyed coordinates to a contour located above the NMWSE (as detailed in the Section 2.2.2).

roads, restroom buildings and the septic and leach field systems. As such, YCWA's schedule was developed to complete the main water line replacement and then begin the process of rehabilitating the recreation facilities either concurrently or sequentially following water system replacement while still providing a phased approach to avoid the closure of multiple facilities at the same time. This avoids repeating costly facility major rehabilitation work such as re-paving recently paved roads; moving or altering recently replaced restrooms; and/or re-aligning, extending or relocating recently replaced septic systems and leach fields that might occur if the underground water system work was completed after major rehabilitation of the recreation facilities.

YCWA recognizes that this approach may not precisely align with the priority of rehabilitation work, particularly for some of the older amenities (e.g., restrooms) based on the current condition of all the facilities and that it may require enhanced minor maintenance of these facilities until the major rehabilitation of the facilities can occur. However, overall, YCWA's believes this approach is ultimately the most efficient and practical approach to provide enhanced recreation facilities over the term of the license with the least disruption to the public overall (minimizes the impact and occurrence of closed facilities) and at significant cost savings to YCWA, primarily by avoiding repeated major rehabilitation efforts at the same facilities.

2.2.2 Proposed Project Boundary

YCWA proposes several changes to the Project Boundary in order to more accurately define lands necessary for the safe operations and maintenance (O&M) of the Project and other purposes, such as recreation, shoreline control, and protection of environmental resources. There are two categories of proposed project boundary changes:

- Proposed addition of lands to the Project Boundary that are currently utilized with a preponderance of use related to the Project O&M, and proposed removal of lands from the Project Boundary that do not have Project facilities and are not used or necessary for Project O&M. These proposed changes are essentially making corrections to the Project Boundary.
- Proposed changes to the FERC Project Boundary around the Project reservoir and impoundments from surveyed coordinates to a contour located above the NMWSE. These changes are proposed, consistent with the preferred method of defining new project boundaries as outlined in the FERC Drawing Guide, as it is a better representation of lands required for Project O&M around the Project reservoirs.

Proposed changes are discussed by Project development below. All proposed changes are described in detail in section 2.0 of Exhibit G.

For the New Colgate Development, YCWA proposes the following changes under the category of corrections to the existing Project Boundary.

- The addition of the areas that encompass 100-ft rights-of-way (i.e., 50 ft on either side of centerline) of six separate Primary Project Roads used to access and maintain the New

Colgate Surge Chamber, New Colgate Powerhouse Penstock and New Colgate Powerhouse. Land in these proposed additions is owned by private land owners and by YCWA.

- The removal of the land owned by Pacific Gas and Electric Company (PG&E) to the east of New Colgate Powerhouse (Yuba County APN 048270011000). These lands are not used or needed for Project O&M and are owned and utilized by PG&E for maintenance of PG&E facilities located within the boundaries of that parcel.
- The addition of the area that encompasses USGS gage 11413517 (located at the Old Colgate Diversion Dam) and the Primary Project Trail used to access the gage for Project O&M purposes. Land in this proposed addition is owned by YCWA.
- The removal of the area that encompasses a section of Marysville Road (County Road 8) that is in the existing Project Boundary. Marysville Road is commonly used for many purposes not related to the Project and as such it is not considered a Primary Project Road. Land in this proposed removal is owned by private land owners and by YCWA.
- The addition of the area that encompasses a 20-ft right-of-way (i.e., 10 ft on either side of centerline) around the Primary Project Trail that is used to access USGS gage #11413517 downstream of the New Bullards Bar Minimum Flow Powerhouse. Land in this proposed addition is owned by YCWA.
- The removal of the area north of an 50-ft offset from centerline of County Road 169 from Cottage Creek Campground to the reservoir's edge. Land parcels in this region are not currently used for Project O&M. Land in this proposed removal is owned by YCWA and is NFS land managed as part of the PNF.
- The removal of the area that encompasses the Administration Site to the north of Sunset Vista Point that is used for non-Project related activities by the Forest Service with the exception of the water supply system to Project recreation sites including a 25-ft offset from water distribution tanks and 20-ft right-of-way (10-ft on either side of water distribution pipe alignments). Land in this area is NFS land managed as part of the TNF.
- The addition of the area that encompasses a 20-ft right-of-way (i.e., 10 ft on either side of centerline) around the Project portion of the New Bullards Bar Trail that follows along the southeast side of the New Bullards Bar Reservoir. Lands in this proposed addition are NFS land managed as part of the TNF, and private land owned by YCWA.
- The addition of the area that encompasses a 20-ft right-of-way (i.e., 10 ft on either side of centerline) around the Schoolhouse Trail that provides access to the Bullards Bar Trail from Schoolhouse Campground. Lands in this proposed addition are federal lands managed by the Forest Service as part of the TNF, Yuba County road right-of-way, and private lands.
- The addition of the area that encompasses a 20-ft right-of-way (i.e., 10 ft on either side of centerline) around the water distribution pipe alignments that parallel both Marysville Rd (County Rd 8) and Dark Day Rd. The water distribution system provides water to Project Recreation Sites and is considered a Project Facility. Lands in this proposed addition are NFS land managed as part of the TNF.

- The addition of the area that encompasses the leach field that is a part of the Hornswoggle Group Campground. Land in this proposed addition is NFS land managed as part of the TNF.
- The addition of the area that encompasses a 100-ft right-of-way (i.e., 50 ft on either side of centerline) around the Primary Project Road that is used to access USGS gage #11408880 located downstream from Our House Diversion Dam. Land in this proposed addition is NFS land managed as part of the TNF.

For the New Colgate Development, YCWA proposes the following changes under the category of redefining the boundary around the Project reservoir and impoundments from surveyed coordinates to a contour located above the NMWSE. A contour 30 ft above NMWSE or 200 horizontal ft from the NMWSE was chosen to define the proposed boundary for each of the three Project impoundments in areas where the boundary is not already defined to encompass Project facilities and recreation sites. The proposed boundary will encompass between 50 and 200 horizontal feet from reservoir NMSWE except where slopes exceed 60 percent, in which case the boundary would encompass less than 50 horizontal feet. As such the proposed boundary will provide shoreline access of at least 50 ft for all areas except for where slopes are unsafe.

- The addition and removal of land such that Project Boundary around New Bullards Bar Reservoir (where the Project Boundary is not encompassing Project facilities) is defined by the lesser (closer to reservoir NMWSE) of either the topographic contour of 1,985 ft, which is 30 ft above the NMWSE, or 200 horizontal ft from the NMWSE. Land parcels in this proposed change are owned by private land owners and YCWA and federal lands managed by the Forest Service as part of the PNF and TNF.
- The addition and removal of lands such that Project Boundary around Log Cabin Diversion Dam impoundment (where the Project boundary is not encompassing Project facilities) is defined by the topographic contour of 2,000 ft, which is 30 ft above the NMWSE. Land parcels in this proposed change are federal lands managed by the Forest Service as part of the TNF, by YCWA, and a small area within a Yuba County road right-of-way.
- The addition and removal of lands such that Project Boundary around Our House Diversion Dam impoundment (where the Project Boundary is not encompassing Project facilities) is defined by the topographic contour of 2,060 ft, which is 30 ft above the NMWSE. Land parcels in this proposed change are federal land managed by the Forest Service as part of the TNF and land owned by private land owners.

For the Narrows 2 Development, YCWA proposes the following changes under the category of corrections to the existing Project Boundary.

- The addition of the area that encompasses a 20-ft right-of-way (i.e., 10 ft on either side of centerline) around the Primary Project trail that is used to access USGS gage #11418000 located downstream of the Narrows 2 Powerhouse. Land parcels in this proposed addition are owned by private land owners.

- The removal of the area that extends south beyond a 100-ft right-of-way (i.e., 50 ft on either side of centerline) along the Narrows 2 Access Road, which is a Project road. These lands are not used for Project O&M and do not have any Project or non-Project facilities. Land parcels in this proposed removal are federal land managed by the USACE, land owned and managed by the State of California, and land owned by private land owners.
- The removal of the area that contains Englebright Dam including a 50-foot offset from the dam structure. These land parcels are not used for Project O&M and do not have any Project or non-Project facilities except for the Narrows 2 Power Tunnel that passes underneath Englebright Dam. As such, the purpose is to remove the portion of the non-Project Englebright Dam from the Project Boundary. Land parcels in the proposed removal are federal land managed by the USACE.

Table 2.2-1. Summary of land ownership within the proposed Yuba River Development Project FERC Project Boundary by Project Development and difference as compared to existing FERC Project Boundary.

Development	Forest Service (ac)	USACE (ac)	State of California (ac)	YCWA (ac)	Other Private (ac)	Total	
						Acres	Percent
PROPOSED PROJECT BOUNDARY							
New Colgate	3,291.2	0	0	2,578.5	195.6	6,065.3	99.5%
New Bullards Minimum Flow	0	0	0	<0.1	0	<0.1	0%
Narrows 2	0	11.1	19.5	1.2	0.8	32.6	0.5%
Total	**3,291.2**	**11.1**	**19.5**	**2,579.7**	**196.4**	**6,097.9**	**100%**
Percent	**54.0%**	**0.2%**	**0.3%**	**42.3%**	**3.2%**	**--**	**--**
DIFFERENCE BETWEEN EXISTING (TABLE 5.0-1) AND PROPOSED PROJECT BOUNDARY							
Difference	**-1,125.5**	**-5.0**	**-0.6**	**-569.6**	**-16.6**	**-1,717.3**	**-21.7%**

2.2.3 Proposed Project Operations

YCWA proposes to continue to operate the Project as it has operated historically (i.e., since 2006 when the Yuba Accord went into effect), with the new facilities and YCWA's proposed conditions, which are listed below.

2.2.4 Proposed Environmental Measures

YCWA's proposed environmental and recreational measures are discussed in Section 3.3 and included in detail in Appendix E2, which also describes whether a measure is the continuation of an existing measure or a proposed new measure. Table 2.2-2 lists YCWA's proposed measures by major resource area.

Table 2.2-2. Measures included in YCWA's Proposed Yuba River Development Project.

YCWA's Proposed Measure	Description
GENERAL	
GEN1	Consult with the Forest Service Annually Regarding Project Effects on NFS Land

Table 2.2-2. (continued)

YCWA's Proposed Measure	Description
GENERAL (cont.)	
GEN2	Consult with the Forest Service Regarding New Ground Disturbing Activities on NFS Land
GEN3	Consult with the Forest Service Regarding New Facilities on NFS Land
GEN4	Consult with Forest Service Regarding Pesticide Use on NFS Land
GEN5	Review Special-status Species Lists and Assess Newly-listed Species Annually
GEN6	Provide Environmental Training to Employees
GEN7	Develop and Implement a Coordinated Operations Plan for Yuba River Development Project and Narrows Project
GEN8	Right to Use Englebright Dam and Reservoir
GEOLOGY AND SOILS	
GS1	Implement Erosion and Sediment Control Plan[1]
GS2	Implement Our House and Log Cabin Diversion Dams Sediment Removal Plan[1]
GS3	Pass Sediment at Our House and Log Cabin Diversion Dams
GS4	Monitor Channel Morphology Downstream of Our House and Log Cabin Diversion Dams
GS5	Pass Large Woody Material at Our House and Log Cabin Diversion Dams
GS6	Implement New Bullards Bar Reservoir Floating Material Management Plan[1]
WATER RESOURCES	
WR1	Implement Hazardous Substances Plan[1]
WR2	Determine Water Year Types for Measures Pertaining to Our House Diversion Dam, Log Cabin Diversion Dam and New Bullards Bar Dam
WR3	Determine Water Year Types for Measures Pertaining to Narrows 2 Powerhouse and Narrows 2 Full Bypass
WR4	Implement Streamflow and Reservoir Level Monitoring Plan[1]
WR5	Maintain New Bullards Bar Reservoir Minimum Pool
WR6	Operate New Bullards Bar Reservoir for Flood Control
AQUATIC RESOURCES	
AR1	Maintain Minimum Streamflows below Our House Diversion Dam, Log Cabin Diversion Dam and New Bullards Bar Dam
AR2	Control Project Spills at Our House Diversion Dam
AR3	Maintain Minimum Streamflows at Narrows 2 Powerhouse and Narrows 2 Full Bypass
AR4	Control Project Spills at New Bullards Bar Dam
AR5	Implement Aquatic Invasive Species Management Plan[1]
AR6	Implement New Bullards Bar Reservoir Fish Stocking Plan[1]
TERRESTRIAL RESOURCES	
TR1	Implement Integrated Vegetation Management Plan[1]
TR2	Implement Bald Eagle and American Peregrine Falcon Management Plan[1]
TR3	Implement Ringtail Management Plan[1]
TR4	Manage Bats at Project Facilities
ESA-LISTED SPECIES	
TE1	Monitor Water Temperature Downstream of Narrows 2 Powerhouse
TE2	Monitor Chinook Salmon Downstream of Narrows 2 Powerhouse
TE3	Establish Lower Yuba River Anadromous Fish Ecological Group
TE4	Control Project Ramping and Flow Fluctuations Downstream of Englebright Dam
RECREATION RESOURCES	
RR1	Implement Recreation Facilities Management Plan[1]
RR2	Provide Recreation Flow Information
LAND USE	
LU1	Implement Transportation System Management Plan[1]
LU2	Implement Fire Prevention and Response Plan[1]
CULTURAL RESOURCES	
CR1	Implement Historic Properties Management Plan[2]

Table 2.2-2. (continued)

YCWA's Proposed Measure	Description
AESTHETIC RESOURCES	
VR1	Implement Visual Resource Management Plan[1]

[1] Plan included in Appendix E3 of Exhibit E of Application for New License.
[2] Plan included in Volume IV of Application for New License, and is considered Privileged.

Appendix E2 includes the full text of each measure included in YCWA's proposed Project. Appendix E3 includes implementation plans identified in the measures. Appendix E4 includes: 1) for each facility necessary for implementation of an environmental measure, a functional design drawing; 2) a description of the operation and maintenance procedures for any proposed measures; 3) an implementation or construction schedule for any proposed measures or facilities, showing the interval after issuance of a new license when implementation of the measure or construction would be commenced and completed; and 4) maps showing the location of the facility or measure.

2.3 Other Action Alternatives

[Relicensing Participants – This section will be completed in the FLA. YCWA]

2.4 Alternatives Considered But Eliminated From Further Analysis

YCWA considered but eliminated from further analysis the following alternatives:

- Retire the Project
- Issue a Non-Power License
- Federal Agency Takeover of the Project

Each of these alternatives and the consideration of factors through which the alternative was eliminated from further analysis are described below.

2.4.1 Retire the Project

Project retirement could be accomplished with or without removal of the Project dams. No Relicensing Participant has proposed that removal of one or more of the Project dams would be appropriate in this case and besides providing for hydroelectric power generation, these dams also provide critical flood-control and water-supply functions, as well as important environmental (cold water pool) and recreational opportunities. For these reasons, there is little practical basis for recommending removal of any of these dams, and dam removal is not a reasonably foreseeable alternative to relicensing the Project with appropriate resource management measures.

The second Project retirement alternative would involve retaining one or more of the Project dams and disabling or removing equipment used to generate power. Project works would remain in place and would be used for historical flood-control, consumptive-use, environmental and recreational water management, or other purposes. No Relicensing Participant has advocated this alternative. Therefore, there is no basis for recommending it. Because the power supplied by the Project is needed, replacement power from some other source, providing comparable ancillary benefits without adding air pollutants would have to be provided. For these reasons, removal of the electric generating equipment is not a reasonably foreseeable alternative.

2.4.2 Issue a Non-Power License

A non-power license is a temporary license that FERC would issue when it determines that a governmental agency, other than YCWA in this case, would assume regulatory authority and supervision over the lands and facilities covered by the non-power license. At this point, no agency has suggested a willingness or ability to do so. No party has sought a non-power license and there is no basis for concluding that the Project should no longer be used to produce power. As stated above, if the power facilities were removed, a source of replacement power would have to be identified. Thus, a non-power license is not a realistic alternative to relicensing in this circumstance.

2.4.3 Federal Agency Takeover of the Project

Federal takeover of the Project is not a reasonably foreseeable alternative. Federal takeover and operation of the Project would require federal Congressional approval. While that fact alone would not preclude further consideration of this alternative, there is no evidence to indicate that federal takeover should be recommended to Congress. No Relicensing Participant or other party has suggested federal takeover would be appropriate, and no federal agency has expressed an interest in operating the Project. So, federal takeover of the Project is not a reasonably foreseeable alternative.